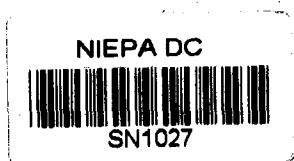




# **BASTAR DEVELOPMENT PLAN**

**STATE PLANNING BOARD, MADHYA PRADESH**



No. 3251/SPB/WG  
STATE PLANNING BOARD  
GOVERNMENT OF MADHYA PRADESH

...

From

Bhopal, dated the 31.12.1984.

R.C. Singh Deo,  
Chairman, Working Group,  
Bastar Development Plan,

To

The Chief Minister,  
Madhya Pradesh,  
BHOPAL.

Sir,

I forward herewith the report of the Working Group set up by the Government of Madhya Pradesh in Planning, Economics and Statistics Department by Notification No.50/81/23/P-2/83 dated 15th January, 1983, for preparing a separate development plan for Bastar district.

2. There has, indeed, been a delay which may appear inordinate in the preparation of the Bastar Development Plan, but this was unavoidable for the reason that considerable time was taken in collecting the statistical data needed for the preparation of such a comprehensive district level plan.

3. I would like to place on record that but for the zeal and untiring efforts of Shri M.R. Sivaraman, Member-Secretary, State Planning Board, Shri L.S.U.P.B. Singh, Director of Economics and Statistics and Shri U.S. Trivedi, Adviser,

State Planning Board, it would not have been possible to prepare this plan. My thanks are also due to all the non-officials and officials who gave their valuable assistance and advice in the preparation of this plan.

4. I take this opportunity to express our gratitude to the Hon'ble Chief Minister for his endearing interest in the development of tribal areas and for providing all encouragement and facilities to us.

5. In conclusion, I would request the State Government to send this Development Plan of Bastar to the Planning Commission for study and consideration for special assistance.

Yours faithfully,

R. C. Singh Deo  
( R.C. Singh Deo )

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## PROLOGUE

The Government of Madhya Pradesh in the Planning, Economics and Statistics Department constituted vide Notification No. 50/81/23/P2/83 dated 15th January, 1983 a Working Group under the State Planning Board, for preparing a separate detailed Development Plan for Bastar district. The Working Group consisted of :

- |   |                  |
|---|------------------|
| 1. Shri R.C. Singh Deo,<br>Member, State Planning Board,  | Chairman         |
| 2. Shri Raj Kumar Khanna,<br>Member, State Planning Board,<br>(Presently Chief Revenue Commissioner,) | Member           |
| 3. Shri I.K. Srinivasan<br>Chairman, M.P.Electricity Board,   | Member           |
| 4. Shri M.R. Sivaraman,<br>Secretary, Finance & Planning,   | Member           |
| 5. Director of Agriculture,   | Member           |
| 6. Director of Veterinary Services,   | Member           |
| 7. Engineer-in-Chief, Irrigation,   | Member           |
| 8. Engineer-in-Chief, Public Works Department,  | Member           |
| 9. Engineer-in-Chief,<br>Public Health Engineering,   | Member           |
| 10. Shri L.S.U.P.B. Singh,<br>Director of Economics and Statistics.                                   | Member Secretary |

2. Subsequently, the Secretary, Tribal Welfare Department and Principal Conservator of Forests were also nominated as members of the Working Group. Besides, following were co-opted as Members of the Working Group :

1. Commissioner of Industries,
2. Registrar, Co-operative Societies,
3. Director of Public Health & Family Welfare,
4. Director of Medical Services,

5. Director of Horticulture,
6. Shri U.S. Trivedi, Adviser, State Planning Board.

3. The task of preparing a development Plan for Bastar proved challenging. The foremost question which presented itself before the Group related to the appropriate strategy and approach to the problems of the tribal people. The district is constituted of different tribes having considerable heterogeneity in their socio-economic and cultural situations. The areas inhabited by different tribal communities differ in topography, climate and accessibility. Their social habits, livelihood patterns and cultural diversities have been determined by their diverse environment. The district is rich in natural resources but is inhabited by poor people who are paradoxically contended nevertheless and thus making the decision with regard to the approach all the more difficult. Inter tribal community disparities relating, inter alia, to the size of the communities create another dimension with regard to the determination of development perspectives. Development has to be potentiated to lessen confrontation and increase social interaction.

4. We have observed that general developmental approaches are influenced strongly by a strong desire on the part of the developer to shape the lives of other people in the likeness of their own thus creating an atmosphere of intolerance for diversity. The life patterns of tribals are full of diversity among themselves as well as in relation to non-tribals. The late Prime Minister of India Shri Jawahar Lal Nehru observed, " I am not at all sure which is the better way of living, the tribal or our own. In some respects I am quite certain theirs' is better..... There is no point in trying to make of them a second rate copy of ourselves". However, the best approach came from Mahatma Gandhi who always advised to approach the poor with the mind of the poor. To reach the tribal effectively is to approach him with the mind of the tribal. Truly, those administrators including both Englishmen and Indians were best liked by the tribals of Bastar, who treated tribals as their equal and participated with them in the tribal spirit. The

fundamental ingredient of a proper approach is to reach out without pretensions of superiority. If only the mind of the tribal could be reached, the rest would follow. It is, however, difficult to comprehend the mind of the tribal without understanding him properly in his social and environmental contexts.

5. A development frame is nevertheless essential since tribals can not be left totally cut off any longer from the national mainstream. They cannot be cordoned off from the rest of us in a state of ignorance and misery. "It was true", to quote Jawahar Lal Nehru again, "that they could not be left cut off from the world as they were. Political and economic forces impinged upon them and it was not possible or desirable to isolate them. Equally undesirable, it seemed to me, was to allow these forces to function freely and upset their whole life and culture which had so much of good in them." Change is inevitable and it is desirable also. It has to be a part of total developmental strategy. However, the rate of change has to be gradual and smooth to ward off any cultural shock which is the product of greatly accelerated rate of change induced in a society. Change is a natural outcome of living in and utilisation of an environment but induced change should be regulated in accordance with the cushion society could produce to stand the strain of change. Otherwise it will create, instead of progress, a state of disorientation, frustration and confusion. The occurrence of such a phenomenon in a tribal society will generate distrust towards development process as well as development functionaries. The great problem is to develop a synthesis for bringing advantage of modern knowledge, research and technology without destroying the freedom and precious value system of the tribals. The development process should then emerge from the tribal situations and exogenous inducement should be limited to the introduction and efficient functioning of catalytic agents capable of promoting growth. The aim should be to generate concrete material benefits to the tribals without any loss of their communal dignity. The development frame, it was felt, should, therefore, include programmes capable of providing

infrastructural base and improving the functioning of local economy with the help and cooperation of local tribal institutions.

6. It has to be recognised that the existing pattern of their living, their isolation, the grinding poverty, problems of their health and education are not simply unfortunate circumstances but stem out of a combination of their physical surroundings and past policies followed through the centuries. The relation of the tribal with his land and forest has to be recognised and development strategy where progress is conceived to be increasingly brought by the poor themselves has to be adopted. This brings the tribal both as an individual and as a community to the fore and it is his all round development which only can bring real progress. Accordingly, it was felt that the individual should be the central target of development. What is needed is to make the tribal individual capable of increasing productivity per unit of area and per unit of labour by improving and reorganising cultivation techniques and providing subsidiary economic activities to underemployed persons in farming activities. Economic reorganisation has to be based on the restoration of ecological balance, creating essential infrastructural base, and organising tribal communities for better management and marketing practices.

7. The major problem in Bastar is the inaccessibility of areas. The utter lack of road and rail communication in the district has resulted in creating some areas completely inaccessible and others partially. Neutralisation of inaccessibility is an area of policy decision. Looking to the need of opening up of tribal areas for optimising the distribution of social services and production inputs it has been felt that the district should be provided with a network of roads. However, it has to be ensured that the distinct identity of the tribals is not threatened and as such initially the interaction of tribals among themselves has to be encouraged. This can be made possible by providing road infrastructure in inaccessible areas. The



functioning of development agencies through community organisations and institutions would impose automatic restrictions on non-tribals from assuming exploitative character. However, other restrictions such as on acquiring property by non-tribals can also be imposed. The neutralisation of inaccessibility will provide opportunity to the next generation to develop confidence and meaningful interaction with non-tribals and prepare themselves for future development. With the opening up of area educational and health programmes would reach people in interior areas. Road development is one single input which can effectively transform economic life of the district.

8. The success of any well meaning plan ultimately depends on its sincere and effective implementation. No amount of thought can perform miracles unless it is translated into action. This requires a team of committed bureaucrats and a cadre of trained extension field agency. There would, no doubt, be outsiders who will organise and implement development programmes but it is essential that most of the functionaries comprising administrative and subordinate cadres should be from amongst the tribals who should be imparted training in development management and extension techniques. The role of development functionaries has been envisaged to assist people in the process of change.

9. The strategy as emerged out of these ideas has been incorporated as a separate chapter in the document. The programme chalked out for different sectors has also preceded with a detailed review of the existing levels of development and the approach and strategy adopted for framing plan proposals.

10. The development of Bastar, should also be viewed from the point of its area. Geographically, the district is bigger than many States in the Indian Union, such as Kerala, Tripura, Manipur, Nagaland and Mizoram. In Bastar, distances play an important part in development costs and unless adequate resources are invested in creating necessary social and economic infrastructure the development of the district would not gather

page. Looking to the size and special tribal problems of the district the Group has recommended the following sectoral outlays.

<u>Sector</u>	<u>Proposed Outlay</u> (Rs. Crores)
1. Agriculture	22.96
2. Horticulture	25.14
3. Veterinary & Animal Husbandry	10.82
4. Fisheries	2.98
5. Forest	53.46
6. Irrigation	103.58
7. Power	34.88
8. Cooperation	19.56
9. Roads	107.47
10. Industry	14.36
11. Water Supply & Sanitation	22.90
12. Medical & Public Health	20.55
13. Education	55.68
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	494.34
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The Working Group was fortunate to get help and cooperation from many knowledgeable persons and experts from various fields. Shri Sundarlal Tripathi, an anthropologist by interest, researcher in ancient history of Bastar and deeply involved in the welfare of tribal people of the area, proved great help in providing relevant historical perspectives and socio-cultural ethos of the people. His personal library remained open to us at all times. Prof. Shankar Tiwari variously helped in evaluating geographical influences on district economy. The members of Parliament and Legislative Assembly from the district took considerable interest in the project and helped in creating a frame through their ideas and desires which subsequently took shape in the Plan. Shri J.S. Kapani, Commissioner, Bastar Division, a real friend of the tribal people of the district, made possible the

speedy collection of material information and provided insight into developments problems of the area. The heads of various development departments too extended fullest cooperation. Near at hand in the State Planning Board Dr. J.P. Sahu and Shri H.R. Sehgal, Deputy Advisers, Dr. H.K. Jain, Junior Consultant, Shri A.P. Kakkar and Shri A.S. Rathore, Assistant Advisers cheerfully underwent the drudgery of gathering, assembling and analysing relevant information and preparing draft notes. Shrimati Shakuntala Singh, A.S.O., Shri Mawal and Shri Kulkarni, Artists helped us with the maps and Ku. Varsha Talwar apart from her contribution as Computer also ungrudgingly typed draft sheets.

I am gratefully thankful to them all.

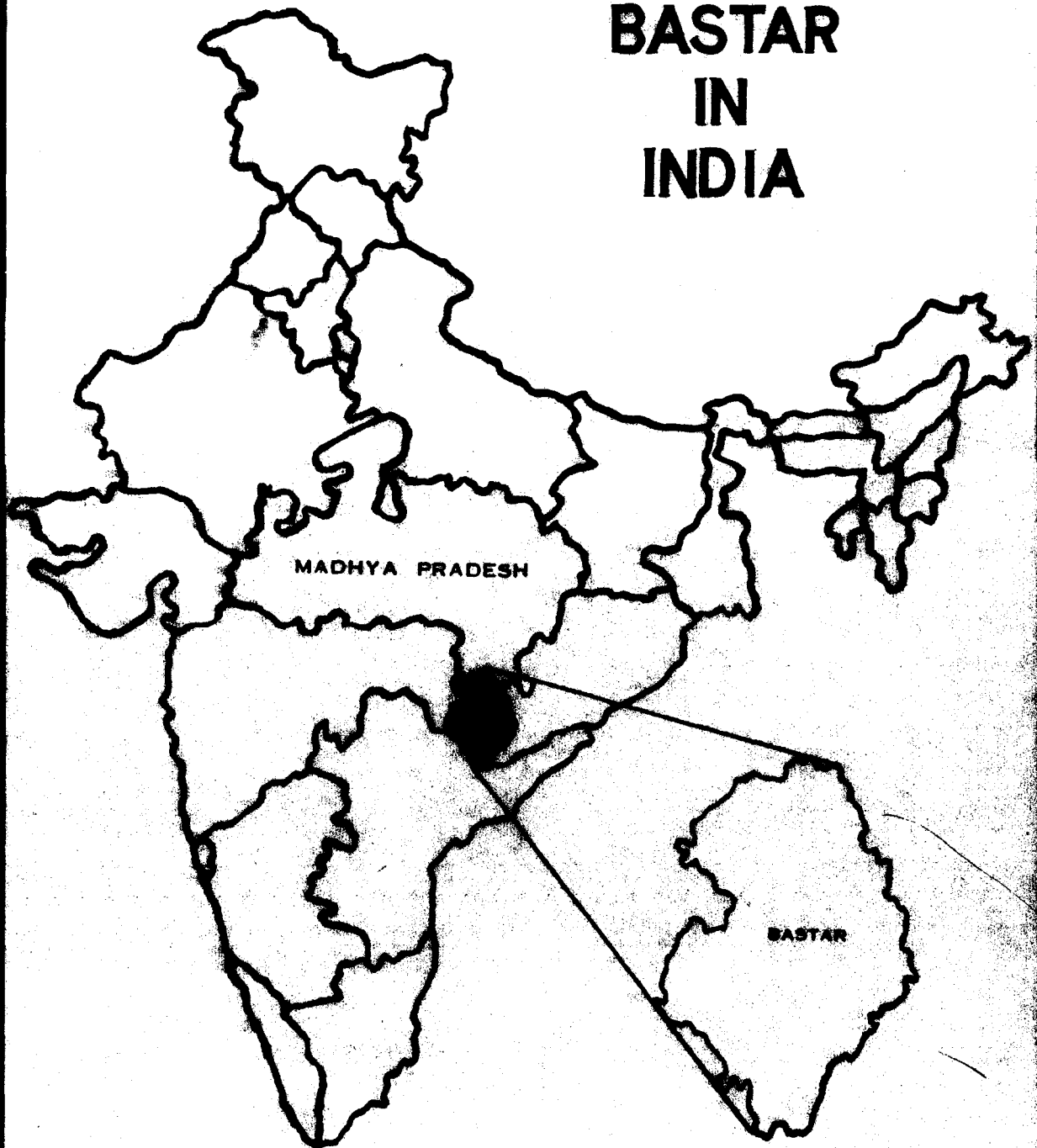
R.C. SINGH DEO  
Chairman,  
Working Group,  
Bastar Development Plan.



BISON HORN MARIA  
HEAD DRESS

## THE SETTING

# BASTAR IN INDIA



MADHYA PRADESH

BASTAR

## B A S T A R

Bastar is situated in the southeastern part of Madhya Pradesh State and is the largest in area amongst all other districts. The total geographical area of the district is 39,114 sq.km. and is only slightly bigger than Kerala State. The district extends from  $17^{\circ}46'$  to  $20^{\circ}34'$  North latitude and  $80^{\circ}15'$  to  $82^{\circ}01'$  East longitude with varying elevations ranging from 150 to 1,200 meters above mean sea level. With a roughly elliptical shape the district has a length of about 290 kms. from north to south and a width of about 200 kms. from east to west. The district is bounded by Orissa on the eastern side, Andhra Pradesh on the southern side and Maharashtra on the western side. Durg and Raipur districts of Madhya Pradesh lie to its north forming its northern boundary. The eastern coast is located at a distance of about 200 kms. from the district but there is very little influence of oceanic climate in the district because it lies on the lee-ward side of the Eastern Ghats. It has a continental climate.

The greater part of Bastar District is a plateau, about 600 m. high, leaving a narrow lowland margin on the north and south. The plateau continues eastwards to Jeypore in Orissa State. The Bastar plateau descends to the Mahanadi Plain (called Chhattisgarh Plain) 300 m. lower on the northern side. Godawari lowland flanks the southwest side of Bastar plateau which gently slopes from 300 m. in the northwest side to less than 150 m. in the southeast. The Indrawati river which bisects the district into almost two equal halves and the Sabri river which flows along the south-eastern boundary, bring this district in the Godavari basin.

There are considerable irregularities in the land surface of Bastar district. Physiographically the district can be divided into the following six divisions.

### (1) Northern lowland

The Kotri-Mahanadi Plain stretches from the northern boundary of the district for about 25 kms. covering most of the parts of Kanker and Bhanupratappur tehsils and the northern parts of Narayanpur tehsil. Northwards, this plain continues into the Chhatisgarh plain of Raipur and Durg districts.

The land surface extends southwards with an elevation of 300 m. to 450 m. up to the Paralkote-Pratappur-Koelibeda-Antagarh-Kanker line. This area is underlain by granites and gneisses. It is diversified by a long, narrow strip of Dharwar rocks forming a chain of hills rising above 450 m height, running north from the midst of Pratappur and Koelibeda. The western part of Mahanadi Plain has a southward slope, whereas northern half has a northern slope along with Mahanadi river. Between these two parts of plains there is no prominent elevation. This plain is founded on the Archaean granites and gneisses whose denudation presents a characteristic rounded topography.

### (2) Keshkal Scarpment

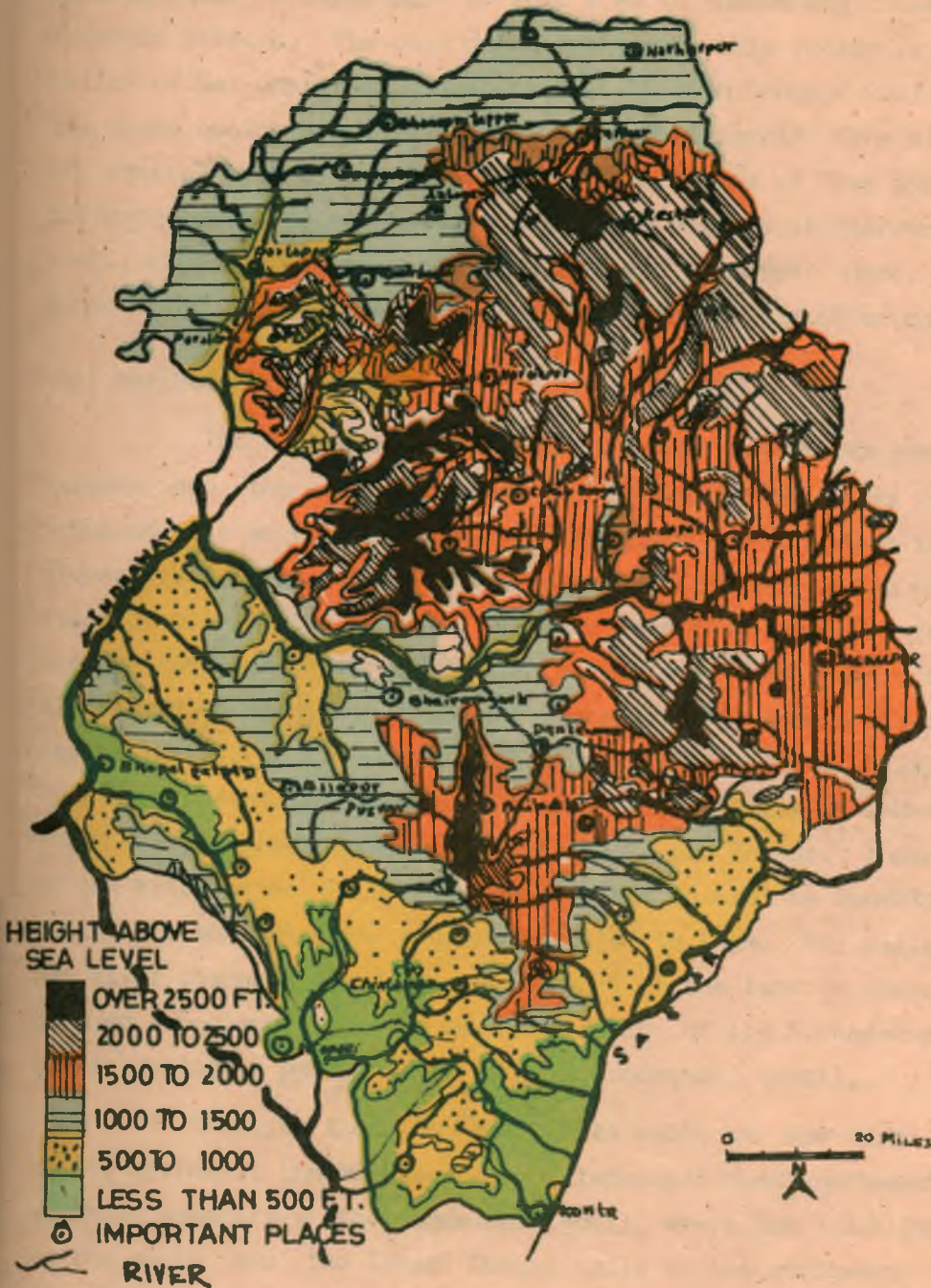
South of northern lowland the land rises steeply for about 150 m to 300 m along the Paralkote-Pratappur-Koelibeda-Antagarh-Kanker line, as observed at Keshkal on the Kanker-Jagdapur road. The steep scarp at the Keshkal line is marked by a Cuddapah and Vindhyan sandstone and quartzite capping of the granites and gneisses as well as by the occurrence of some Dharwar patches. These caps and patches have preserved their elevation because of their resistance to denudation.

### (3) Abujmar Hills

The land surface along the Paralkote-Keshkal-Kutru is maintained at a height of 600 to 750 m. throughout the central part of the district except that in western part it is so dissected as to possess a local relief of 150 to 300 m. giving it a hill form, known as Abujmar hills, in the southern part of Narayanpur tehsil and the



# RELIEF BASTAR



northern margin of the Bijapur tehsil. Its eastern limit is near Narayanpur and Chhote Dongar. Few crests and peaks in the Abujhmar hills exceed 900 m height elevations above mean sea level. The region is about 95 kms long from north to south and about 55 kms broad from east to west. A large part of this area is rugged and dissected by numerous streams. The easy communication to this region is along the valley of Nei Bharat from east to west through Sonepur village, otherwise the whole region presents effective physical barrier from all sides. The central part of the Abujhmar hills is formed of Trap rocks and the northern, southern and eastern edges have patches of Dharwar and Cuddapah rocks, capping the widespread granites and gneisses. Here, again, the presence of higher land is due to the volcanic and other capping rocks.

#### (4) Northeastern Plateau

The Northeastern Plateau lies east of the Abujhmar hills and extends upto the eastern boundry of the district. It is the Bastar highland. It occupies chiefly the Kondagaon and Jagdalpur tehsils and slopes gently from about 750 m height near Keshkal in the north and Tulsi Dongri in the south to slightly less than 600 m in the middle around Jagdalpur which is 500 m in elevation. This eastern highland is also known as Kondagaon-Jagdalpur plateau. It ascends steeply, characteristically, at the Keshkal Ghati or the Telinghati hills scarpment. From here the plateau gradually slopes to the valley of Indrawati along which are situated Jagdalpur, Chitrakoot and Barsur. There are valleys of the tributaries of the Indrawati, from Keshkal to Jagdalpur, running mostly southwards with uplands parallel to them. The valleys are just the river channels in width and the bulk of the land is characterised by rounded topography, that is characteristic of its Archaean granite and gneiss geology, particularly in the Kondagaon tehsil.

Starting from the Telinghati hills on the north and Matalghati on the northwest the Northeastern Plateau continues southwards to the southern boundry of the Jagdalpur tehsil, where the Tulsi Dongri hills in the south and the Tangai Dongri hills in the southwest demarcate it from the Dantewara plateau and the Sukma lowland. The Tanqri Dongri

hills run a little west of the Tirathgarh-Chitrakoot line and slope moderately steeply on both the sides.

The Indrawati Plain, forming the greater part of the Jagdalpur tehsil east of a line roughly through Bhanpuri-Chitrakoot-Tirathgarh, is a subdivision of the Northeastern Plateau. The river Indrawati flows across this plain in the middle where Jagdalpur stands. The surface of this plain is very gently rolling due to the alternations of the river valleys and the water divides, quite distinct from the rounded topography of the granite and gneiss plateau and plains.

#### (5) Southern Plateau

A slightly lower plateau region of about 300 to 600 m elevation extends to the southwest of the North eastern plateau, covering Dantewara tehsil and the northern parts of Bijapur and Konta tehsils. The Southern Plateau starting from the Tangri Dongri hills on the east continues to the Indrawati river on the west and to the north. This plateau is also formed of granitic and gneissic rocks and possesses a rounded surface. It slopes gently on the north, southwest and the west. On the southeast the plateau descends to the Godavari-Sabari Lowland near Tongpal, Samsatti, Chintalnar and Jagargunda.

The Bailadilla hills, a double ridged range running north-south along the western boundary of the Dantewara tehsil and attaining about 1,100 m elevation are the expression of the folded and highly elevated Dharwar formations. The elevations form a considerable physical barrier because of their great height and narrow breadth.

The Tikanpalli Hills lying between Chintalnar and Samsatti occupy the southern corner of the Southern Plateau. These hills are also formed of the granites and gneisses and therefore, present a moderate elevation above the plateau in comparison to Bailadilla hills.

The southeastern edge of the Bijapur-Dantewara plateau is marked by a steep decline to about 150 m lower land in which are situated the villages of Gadiras and Sukma. The Dantewara Plain is formed by the denudation of the northern part of the Dantewara Plateau by

the Dantewara river which is a tributary of the Indrawati. It lies between the Bailadilla and Tangri Dongri hills and occupies the lower basin of the Dantewara river. Gidam and Barsur, two prominent villages of the Dantewara tehsil lie in this plain. It is also possessed with a rounded topography, on account of the underlying granites and gneisses.

#### (6) Southern Lowland

The Sukma lowland with a surface height of 150 to 300 m continues southwest as a wide strip of roughly 25 km along the district boundary to Konta and, thereafter, crossing the moderately high Golapalli hills, there is lowland stretching northwards to Bhopalpatnam. The Godavari-Sabri lowland extends from the southern boundary of the District to the base of the southern plateau. The descent from the Jagdalpur plateau to it, marked by the Darbha Ghati is very steep. This lowland is due to the denudation of the southern granites and gneisses by the numerous tributaries and sub-tributaries of Godavari and Sabri rivers which flow in Konta tehsil and southern Bijapur. The lowland is far from a flat plain. It possesses a rounded topography due to its geology. Usur hills are formed of Cuddapah formations and attain about 450 m height in contrast to the adjacent Sukma-Bhopalpatnam lowland. The Golapalli hills which occur in this lowland do not attain the height of the Usur hills.

#### Lithology

The mass of earth's crust in Bastar district is formed of various very old rocks belonging to the Pre-Cambrian and Cambrian Era. These rocks differ in their mineral constitution and physical structure, and can be classified as follows :-

- (a) The Dharwar
- (b) The Archaean Granites and Gneisses
- (c) The Ulder Trap
- (d) The Cuddapahs
- (e) The Vindhyan

**(a) The Dharwar rocks**

The Dharwar rocks are sedimentary and metamorphic and have undergone folding and faulting. The axes of the folds running, generally, north to south. These rocks are roughly confined to a belt running north-south in the middle of the district, and at various other places in patches. These comprise of an older Bengal series and a younger Bailadilla series of rocks. The Bengal series comprise hornblende-schists, slates, sandstones, quartzites, quartz-schists, chloritic-schists and magnetite-quartz-schists. The Bailadilla series belonging to the Upper Dharwar age, correspond with the iron ore series of Sighbum (Bihar). They comprise haematite-quartzites, iron ores, haematite-chlorite and haematite-grunerite rocks, ferruginous conglomerates and white quartzite.

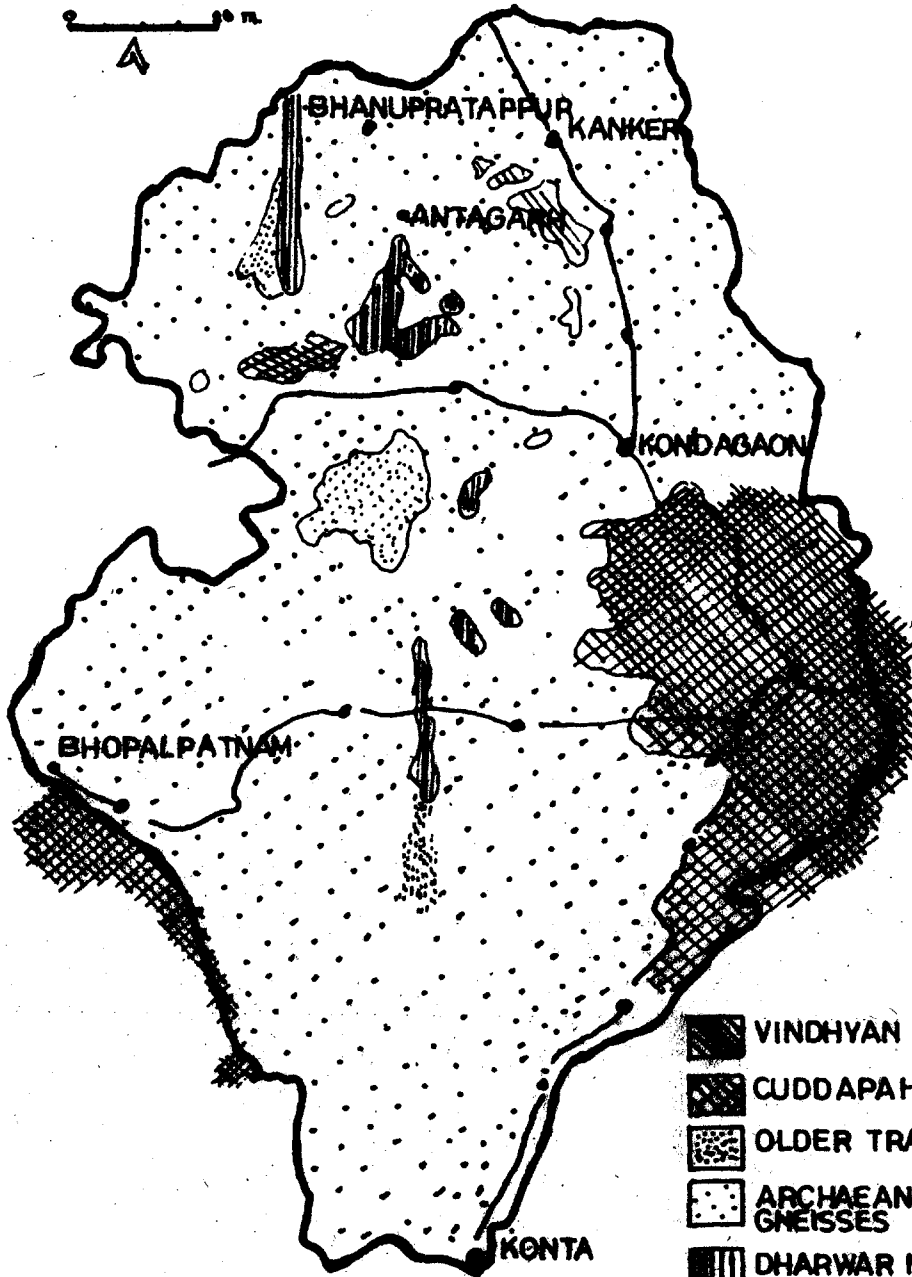
Dharwar rocks, in Bastar district, occur in : (i) the Bailadilla hills on the western boundary of the Dantewara tehsil (ii) the Raoghat hills on the northern margin of the Abujhmar hills, between Antagarh and Narayanpur in the Narayanpur tehsil and; (iii) chain of hills running from the midst of Pratappur and Koelibeda in Narayanpur tehsil northwards to Bhanupratappur tehsil.






**(b) The Archaean Granites and Gneisses**

About three fourth of the area of the district is covered by Archaean granites and gneisses. These are widespread while all other formations lie as patches over them. The granites of Bastar are composed of the minerals, quartz and felspar, with some ferromagnesian minerals, like biotite (black mica) and hornblende. These granites are intrusive, acid igneous rocks. On metamorphosis they become gneiss and attain a foliated structure, the various layers being rich or poor in one or two of the constituent minerals.

The greater part of Bastar region consists of granitoid gneiss. This is a coarse, usually binary rock, with little or no sign of foliation except near the ridges of other rocks, where it is frequently folded and banded. Southern Bastar is largely occupied by the foliated

# GEOLOGY BASTAR



-  VINDHYAN SEDI. ] nearly horizontal
-  CUDDAPAH SEDI. ] nearly horizontal
-  OLDER TRAP
-  ARCHAEOAN GRANITES & GNEISSES
-  DHARWAR METAMORPHOSED  
(Generally folded)

schistose gneisses.

### (c) The Older Trap

The Trap rocks of Bastar district are considered to be much older than the Deccan Trap. These rocks are even older than the Vindhyan and Cuddapahs. The Trap rocks are extrusive basic or basalt rocks, produced by volcanic activity. They occur in Abujhmar hills, west of Orcha and between Pratappur and Koelibeda, both located in Narayanpur tehsil.

### (d) The Cuddapah Formation

In Bastar district four areas are covered by the Cuddapah formations. The largest of these extends from Mardapal, in Kondagaon tehsil to Tirathgarh, in Jagdalpur tehsil and from Chitrakote to Jagdalpur. This area forms a considerable part of Jagdalpur tehsil and extends to the southeastern border of Kondagaon tehsil. These further extends in the adjoining Koraput district of Orissa. The second largest area of Cuddapah border of the district is extending from Bhopalpatnam in the northwest to Kotapalli in the southeast. The remaining two patches are small and occur in Abujhmar hills between Paralkote and Sonapur in the Narayanpur tehsil. The Cuddapah rocks of Bastar include quartzites, sandstones, limestones and phyllitic shales and possess nearly horizontal bedding.

### (e) The Vindhyan Formation

The Vindhyan, which are youngest of the Bastar rocks, occur in small patches on the west and east of Keshkal, along the tehsil boundary between Kanker and Kondagaon. They cap the high edge of the Northeastern Plateau with quartzitic sandstones of nearly horizontal bedding.

### General Soil types

Laterites and lateritic soils cover a large area of Bastar district. In some areas red and yellow soils also occur in patches. In

Abujmar tract where the Trap rocks occur the slopes have thin, light soils rather than the deep black cotton soils, whereas fresh alluvial soils are found in the beds of rivers and streams. The texture of the soil varies from sandy to fine textured clayey soils.

#### (a) Laterites and lateritic soils

The primary laterites are found as a cap on the top of the trap and gneissic rocks. About three fourth of the area of the district is covered by trap and gneissic rocks. The high level laterite is poor and gritty and poor in nutrients, especially, potash, phosphoric acid and lime. Highly laterised soils are bad both for sal and teak alike. Feebly laterised soils with higher silical aluminium ratio supports better quality teak. The secondary laterities are usually found in the valleys and lowlying places. They are formed as a result of the weathering of primary laterites on the hilltops and their deposition on the lower slopes and valleys. These soils are of fine texture and darker hues and are rich in humus. The fine quality of sal is found in the valleys on secondary lateritic deposits. The lateritic soils are the result of high humidity and tropical conditions. The vegetation consists of broadleaved species with high foliar ash content. High humidity and temperature increase the activity of micro-organisms and the organic matter is rapidly decomposed into humic matter. Hydrogen ion concentration (pH) of the soil is less than seven and therefore the soils are acidic. Basic rocks accelerate the process of laterisation. The fertility of the tropical soils is due to high level of organic matter and the tropical forest lives largely on the product of its own decay. If such a forest is destroyed, there occurs intensive leaching and loss of plant nutrients and agricultural and other crops can not be grown for more than a couple of years.

#### (b) Red soils

Soils with moderate to little moisture of the tropics or sub-tropics can be categorised as red and yellow soils. These soils





are characterised by light texture, porous and loose structure, absence of lime 'Kanker' and free carbonates and the percentage of soluble salts does not exceed 0.05. These are mostly found on the hill tops and plateaus. Yellow and red soils (terra rosa) are deficient in nitrogen, phosphoric acid and lime. pH value of these soils is higher than laterites. The ratio of silica/aluminium is relatively higher. These soils are relatively better than the laterites from the point of view of plant nutrition.

### (c) Alluvial soils

In the rivers beds of Indrawati, Godavari and Mahanadi deposits of fresh alluvial soils are found. The fresh alluviums are the most fertile soils from the agricultural point of view.

### The Climate

Bastar district can be divided into three regions-based upon climatic conditions : (i) humid, (ii) moist subhumid, and (iii) dry subhumid. The climate, in general, is of monsoon type and is thus strongly seasonal. Following four seasons can be clearly demarcated :

- (a) South-west monsoon season - from the month of June to September/October.
- (b) Postmonsoon season - months of October and November.
- (c) Winter season - from the month of December to February.
- (d) Summer season - from the month of March to May/June.

In the district Meteorological stations are located at Jagdalpur and Kanker where data for temperature, rainfall, humidity, wind etc. are recorded. Whereas only rainfall data is being recorded at all the tehsil headquarters by Land Record Office.

#### (a) Temperature

The mean temperature remains above 20°C during nine months in Jagdalpur region whereas at Kanker it remains so throughout the year.

Thus the climate of Kanker region or northern parts of the district is comparatively warmer than the central region of Jagdalpur. Temperature during the months of April to September remains higher whereas the months of December, January and February are cooler. During the summer season the diurnal variations are large as compared to the winter season.

#### **(b) Rainfall**

The monsoon sets in the month of June and continues upto the month of October. Large amount of precipitation is received during the months of July, August and September followed by a steep fall. Winter rains are occasional. Bijapur receives the highest amount of rainfall followed by Bhanupratappur, Jagdalpur, Narayanpur and Dantewada. Kanker and Kondagaon receives comparatively less amount of rainfall. The intensity distribution of rainfall is generally normal.

Occurrence of rainfall during the monsoon season is due to the southwest monsoon winds. The incidence of rainfall is different in the various parts of the district due to physiographic conditions. The Matalghat-Abujhmar-Bailadilla-Golapalli hills running north-south, through the middle of the district, bisect it into two halves, the western side being windward receives more rains than the eastern or leeward side. Average rainfall of the district varies between 1,000 mm to 1550 mm in different regions.

#### **(c) Relative humidity**

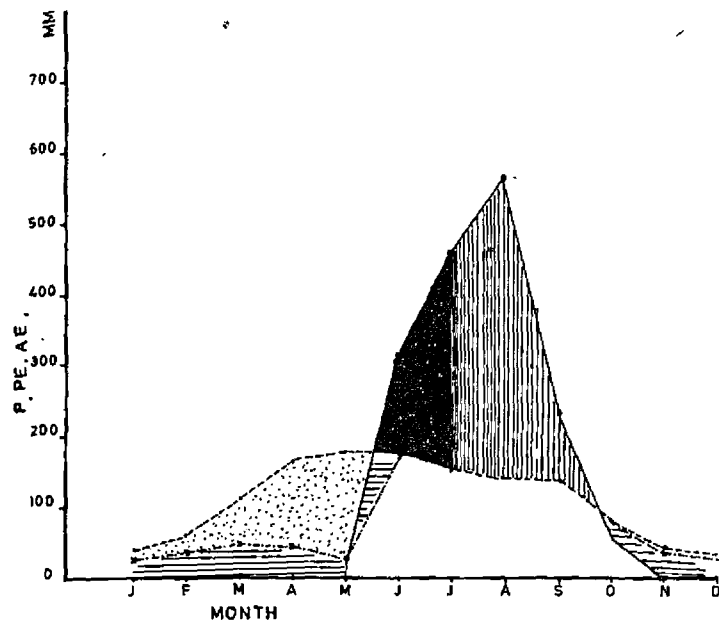
Relative humidity remains higher during the rainy season followed by winters. Summers are marked with the minimum relative humidity. Of course, in the autumn there remains significant amount of relative humidity in the morning hours (perhaps due to low temperatures).

#### **Ecoclimate**

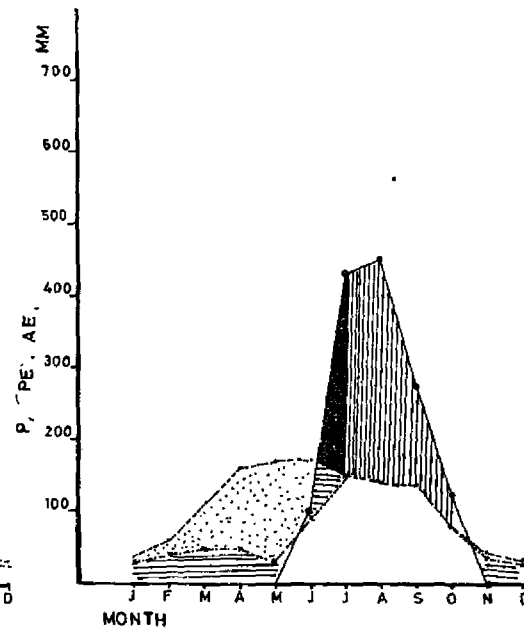
The ecoclimate of eight localities (tehsil headquarters) has been calculated on the basis of monthly rainfall data, recorded at all the tehsil headquarters for the year 1981-82, and mean monthly

# ECOCLIMATE OF 8 TAHSILS OF BASTAR DISTRICT

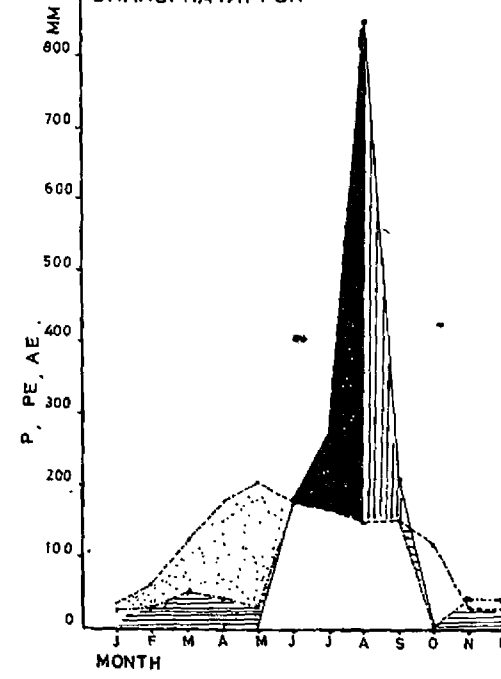
BIJAPUR



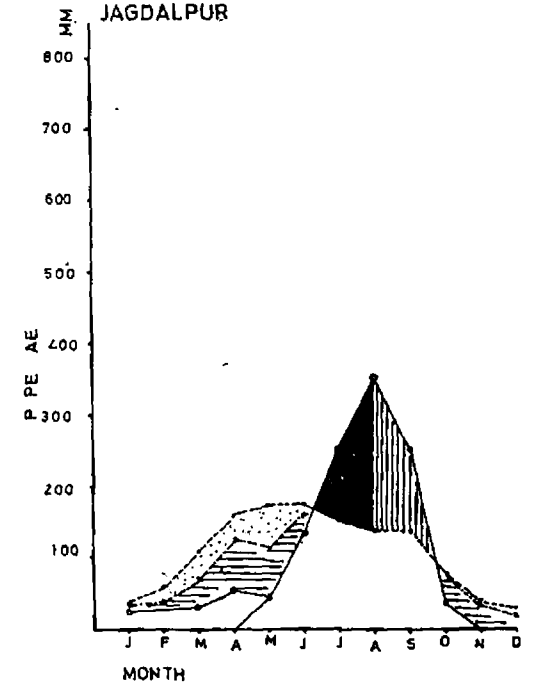
DANTEWADA



BHANUPRATAPPUR



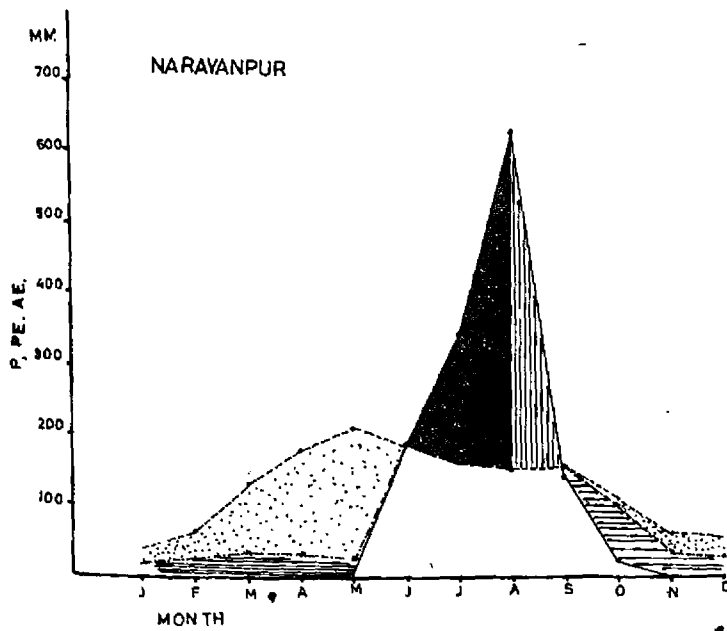
JAGDALPUR



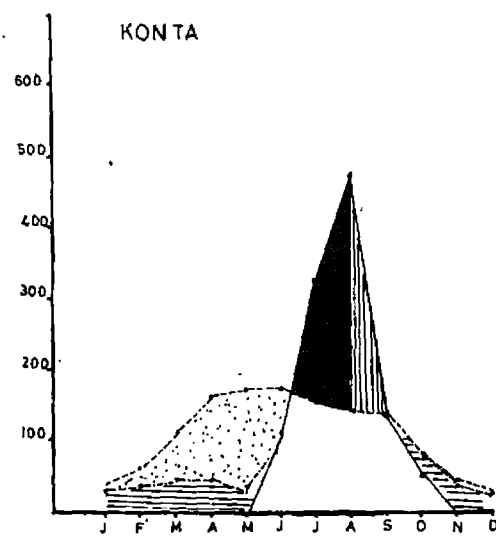
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- POTENTIAL EVAPOTRANSPIRATION (PE) - - - - -
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- SOIL MOISTURE RECHARGE [Solid black fill]
- SOIL MOISTURE USE [Diagonal lines /]
- SURPLUS [Diagonal lines \]
- DEFICIT [Cross-hatch pattern]

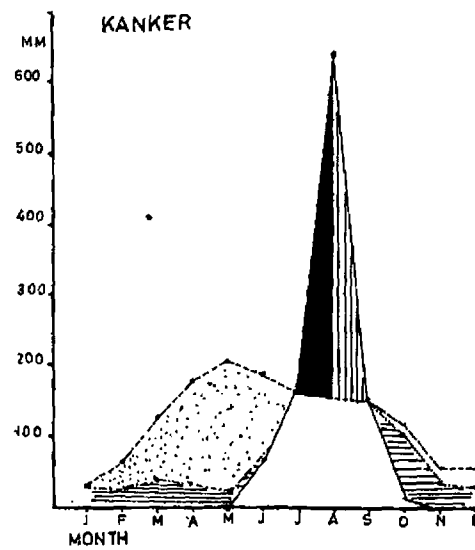
NARAYANPUR



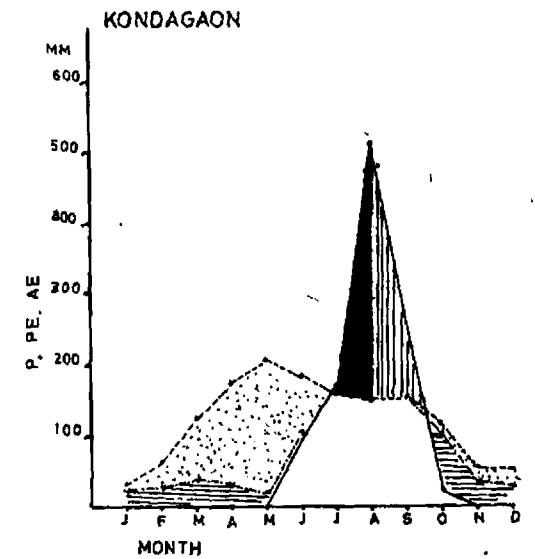
KONTA



KANKER



KONDAGAON



temperatures recorded at Jagdalpur and Kanker stations for the year 1981. Temperature data recorded at Jagdalpur were taken into consideration for Bijapur, Dantewada and Konta localities, whereas, for Bhanupratappur, Narayanpur and Kondagaon localities the temperature records of Kanker station were considered for computation of climatic indices. The computation has been done as per the method suggested by Thornthwaite and Mather (1955).

The ecoclimate of the region varies from humid to moist sub-humid type. Bijapur has come out to be humid locality. Dantewada, Bhanupratappur, Jagdalpur and Narayanpur are the moist sub-humid localities, whereas Konta, Kanker and Kondagaon experience dry subhumid type of ecoclimate. Table below gives the annual values of various ecoclimatic indices computed for eight localities.

Ecoclimatic Indices (Annual)	S T A T I O N S							
	Bija- pur	Dante- wada	Bhanu- prata- ppur	Jagd- alpur	Nara- yanpur	Kon- ta	Kan- ker	Kon- daga- on
1	2	3	4	5	6	7	8	9
1. Rainfall(mm)	1592	1371	1515	1304	1310	1113	1041	1056
2. Potential evapo- transpiration(mm)	1288	1288	1476	1288	1476	1288	1476	1476
3. Actual evapo- transpiration(mm)	917	870	928	1099	939	853	856	877
4. Water surplus(mm)	675	501	593	205	374	260	213	186
5. Water Deficit(mm)	371	418	548	189	537	435	620	599
6. Humidity Index(%)	52.4	38.9	40.2	15.9	25.3	20.2	14.4	12.6
7. Aridity Index(%)	28.8	32.4	37.1	14.7	36.4	33.8	42.0	40.6
8. Moisture Index(%)	35.1	19.4	17.9	7.1	3.5	-0.1	-10.8	-11.7
9. Water Status(mm)	2674	2416	2311	2230	1522	1946	1162	1164
10. Type of Eco- climate	HUMID	----	MOIST	SUBHUMID	-----	--	DRY	SUBHUMID--

**(a) Bijapur**

Ecoclimate of Bijapur is humid, second mega-thermal with little water deficiency during summers. Water surplus is recorded in three months of July to September. Availability of soil water remains sufficient throughout the year for plant growth. Water status (WS) or water present in the soil and available to the plants is always on the positive side except in the months of March, April and May. This type of ecoclimate can support moist deciduous to tropical semi-evergreen type of broad leaved forests.

**(b) Dantewada**

The ecoclimate is moist subhumid, second megathermal with little water deficiency during summers. Moisture index is 19.43 which indicates that the ecoclimate is just on the marginal boundary of humid ecoclimate. Otherwise the ecoclimatic situation is almost similar to that of Bijapur region, and can support moist deciduous type of forests.

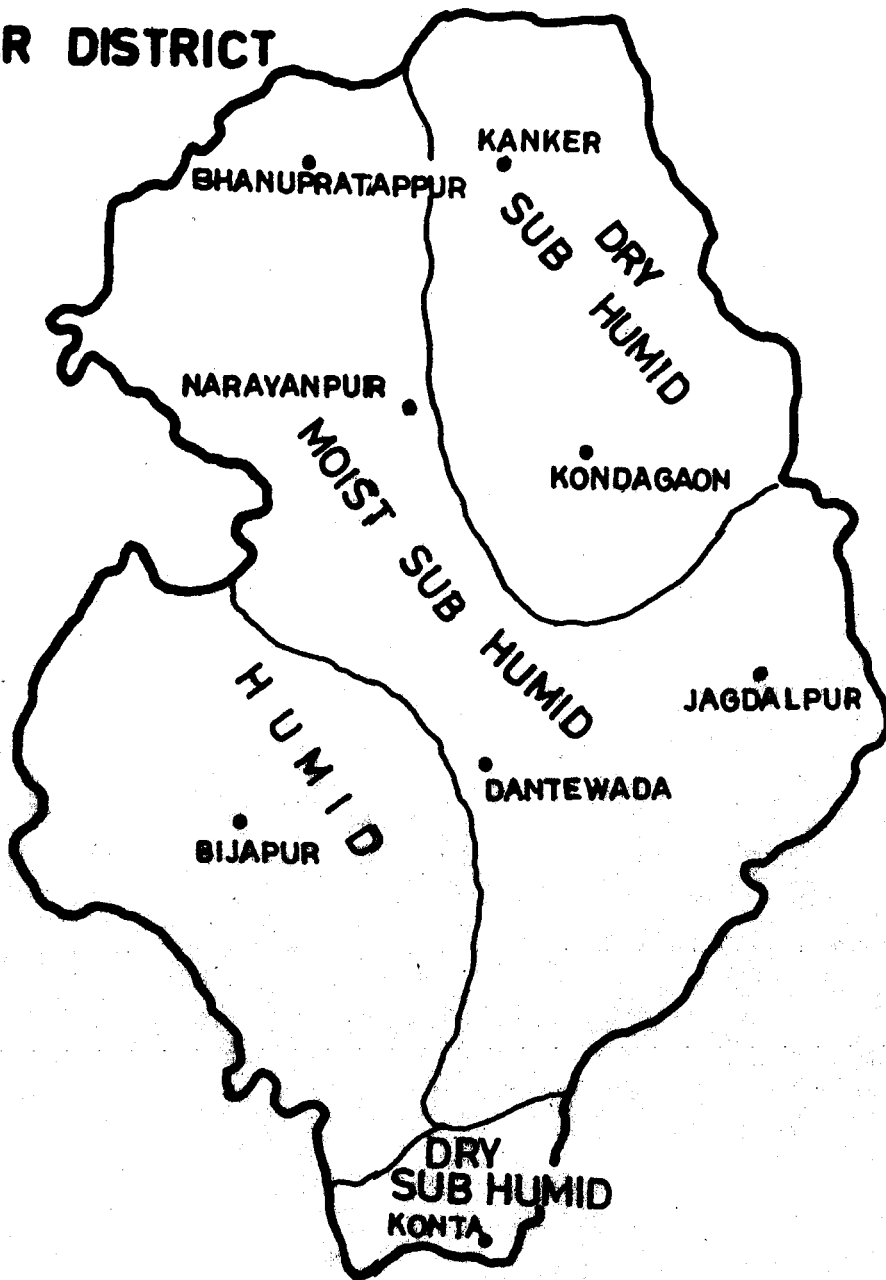
**(c) Bhanupratappur**

The ecoclimate of Bhanupratappur is moist subhumid, third megathermal with little water deficiency during summers. Out of the eight localities in the district under consideration, highest monthly rainfall of 849 mm in the month of August has been recorded in Bhanupratappur in the year 1982. During the months of August, September and October the amount of water available in the soil is more than its holding capacity. Such type of ecoclimate can sustain moist to dry deciduous type of forest.

**(d) Jagdalpur**

Jagdalpur experiences moist subhumid type of ecoclimate, second megathermal with little water deficiency. Water surplus or excess water available in the soils is in two months, i.e., August and September. Water status is always on the positive side except in the month of May. During the months of August and September the water

# ECOCLIMATIC REGIONS OF BASTAR DISTRICT



0 20 KM

present in the soil is more than its holding capacity. In this region the ecoclimate can support dry deciduous type of tropical forests.

**(e) Narayanpur**

The ecoclimate of Narayanpur is moist subhumid, third megathermal with little water deficiency experienced during summers. Water surplus is recorded only in the month of August. Moisture index of 3.51 indicates climate more towards dry subhumid type. Such type of ecoclimate supports tropical dry deciduous type of vegetation.

**(f) Konta**

Konta experiences dry subhumid type of ecoclimate, second megathermal with moderate winter water surplus. Water surplus is little during August and September months. Negative water status has been recorded from March to June. Deficiency of water remains more during the summer months. Amount of soil water exceeds water holding capacity in August and September months. Thus, dry subhumid type of ecoclimate with high potential evapotranspiration rates during summers can support scrubby, dry deciduous type of forest vegetation.

**(g) Kanker**

Kanker is also having dry subhumid ecoclimate, third megathermal with moderate winter water surplus. Water deficiency is comparatively large during summer months whereas water surplus is recorded only in August. In four months, i.e., March to June, the water status is on negative side. Soil water exceeds water holding capacity in August. Dry deciduous type of forest vegetation can be supported in such regions.

**(h) Kondagaon**

The ecoclimate of Kondagaon is dry subhumid third megathermal with moderate winter water surplus. Ecoclimate of Kondagaon is almost similar to that of Kanker region and, therefore, it can also support deciduous type of forest vegetation.

Thus, Bastar can be classified ecoclimatically in following three regions



(i) **Humid** - the southern plateau - west of Bailadilla and Tikanpalli Hills, mostly constituted of Bijapur tehsil. Usur hills lies southwest of this region.

(ii) **Moist subhumid** - Abujmar hills, north western parts of Kotri-Mahanadi Plain, eastern parts of southern plateau covering Dantewada plains, right upto Sukma and southern parts of northeastern plateau covering Indrawati plains of Jagdalpur region constitute this zone. Most of the area under Bhanupratappur, Narayanpur, Dantewada and Jagdalpur tehsils comes under moist subhumid region.

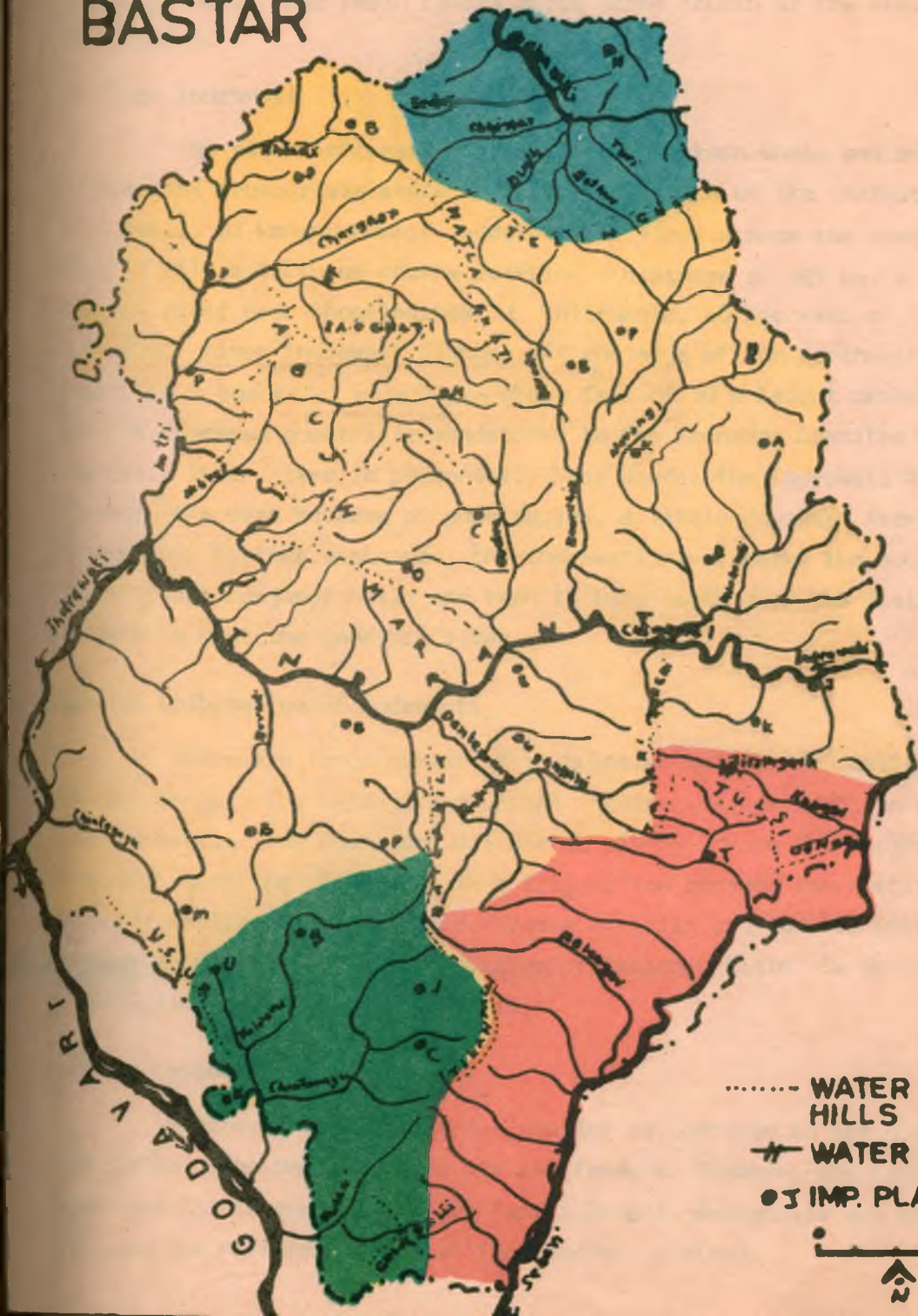
(iii) **Dry subhumid** - eastern parts of Kotri - Mahanadi plain constituted of Kanker tehsil, northern parts of Northeastern plateau covering Kondagaon tehsil and very small region south of Golapalli hills situated inKonta tehsil constitute this region.

#### **The Drainage**

Drainage of the whole district is very good owing to its physiographic conditions. Most of the rivers are perennial. Rivers swell up after receiving heavy rains during the period from mid-June to October months. Some local inundations of the lowland occur in the vicinity of some rivers, for example along the Sabri river near Konta. But in reference to their area these inundations are not significant. The volume of the river subsides during the winter season and they flow gently. During the summers volume is so much depleted that the rivers become stagnant at places. The rivers are generally small except Godavari and Indrawati, their valleys are approximately not more than 50 m wide and 10 m deep. The beds are rocky and gravelly and at few places sandy. The river courses are gently meandering, the flat plain of the Indrawati, however, being the site of big meanders.

The drainage system of Bastar divides it into two unequal parts: (i) the Godavari basin, and (ii) the Mahanadi basin. Telinghati hills form the main watershed between them.

# DRAINAGE BASTAR



..... WATER DIVIDING HILLS

# WATER FALL

● IMP. PLACES

0 10 20 Miles



### **(a) The Godavari basin**

Indrawati, Godavari, Sabri, Tel, Narangi, Gudra, Nei Bherat, Kotri, Dantewada, Dudh are the important rivers which form the Godavari basin. This basin covers about three fourth of the area of the district.

#### **(i) River Indrawati**

The river Indrawati rises from the Eastern Ghats and enters the district from Orissa state near the confluence of its tributary, the Bhaskal, 22 km upstream of Jagdalpur. It flows across the centre of the district with a tortuous course covering a distance of 385 km. & joins the Godavari river near Bhopalpatnam. At Chitrakote, 40 kms west of Jagdalpur, river Indrawati plunges off the edge of the north-eastern plateau in a beautiful horse-shoe shape fall of 30 m height descending from the Cuddapah quartzitic sandstones to the Archaean Granites and Gneisses. This river is perennial. Near Bendri the Indrawati Valley is about 90 m deep because of some rapids, a little downward from Chitrakote. Further westwards, the Indrawati river marks the southern limits of the Abujhmar hills and then it turn south near the district boundary to meet the Godavari river.

#### **Northern tributaries of Indrawati**

There are large number of tributaries meeting Indrawati on both the banks. The Narangi and Baordi drain the northeastern plateau into Indrawati. The Gudra and Nei Bherat rivers drain the Abujhmar hills and join the Indrawati in a trijunction beneath the fortified rocks of Bhairamgarh in a wild expanse of hills and forests unbroken by a single clearing. The Bhanupratappur-Antagarh Plain is drained by the Kotri, north of Abujhmar hills.

#### **Southern tributaries of Indrawati**

Southern tributaries are smaller as compared to the northern tributaries. The Dantewada and its two feeders, Sankhini and Dankani, Berudi and Chintavagu drains the Tangri Dongri, Bailadilla and Usur hills and the northern slopes of the southern plateau.

**(ii) River Sabri**

The Sabri is a big river and receives number of tributaries from the southern lowland. The southern lowland is divided into two parts with the Tikanpalli-Golapalli hills as the watershed. The eastern part is drained by the river Sabri and western parts by other small tributaries of Godavari. River Sabri forms the boundary of the district, on southeast side, with Orissa state for about 135 Km. The total length of the river in the district is 180 Km.

**(iii) River Godavari**

River Godavari forms the district boundary near Bhadrakali for about a distance of 24 Km only. It is a big river and flanked by high lands on both the banks. At this place, the Godavari valley is narrower than further downstream.

**(iv) The Mahanadi basin**

The Mahanadi basin is comparatively smaller than the Godavari basin covering only Kanker tehsil. The river flows through this area just after its source. Beyond this district Mahanadi, a small river in Kanker tehsil being in its upper reaches, is a very big river in Raipur district. Few tributaries descend from the Telinghati hills and join Mahanadi in Kanker. These tributaries fall abruptly from the Telinghati scarpment but because of their low volume, they do not make big falls. The total length of the river in the district is 64 km.

**Flora of Bastar district**

Tropical dry deciduous to moist deciduous types of forests occur in this region. An interesting overlap of the southern and northern forms of the tropical dry deciduous forest characterised by teak and sal, respectively, occurs in Bastar division. This represents the 'ecotone' or the 'tension belt' zone where two species with different ecological characteristics are trying to gain supremacy over each other. The absence of teak from certain regions is perhaps due to physical or physiological dryness of the soil conditions. Dry Peninsular Sal is found in this region. The typical quality class is of III-IV. The

natural regeneration is fair but slow except under shade. The characteristic associates are Anogeissus latifolia (Dhawra), Terminalia alata (Saja), Pterocarpus marsupium (Bija), Mitragyna parviflora (Karam), Dendrocalamus strictus (Bamboo), Gardena, Boswellia serrata, Diospyros melanoxylon (tendu), Buchnania lanzan (Char), Sterculia (Kulu), Bauhinia (Amtar), etc. Among shrubs Woodfordia, Indigofera and Carlssa spinarum are often abundant. Heteropogon contortus and Eulaliopsis binata (Sabai), are the characteristic grasses.

Eucalyptus plantation has been done by the Forest Department covering more than 10,000 ha. of area. On an experimental basis Pine was also introduced in an area of 1,600 ha. Agave sp. (Sisal) is another commercially important species and its fibre is used in the manufacture of ropes, bags, sacks, fishing nets, brushes and brooms etc. Terminalia arjuna (Arjun) and Morus albal (Mulberry) plantations are also found.

#### Fauna

Bastar region is rich in Fauna, especially wild animals. Tiger, Panther, Sloth Bear, Gaur (Indian Bison), Swamp Deer, Spotted Deer (Sambhar and Chital), Nil-gai (Blue Bull), Barking Deer, Mouse Deer and Wild Boar are common big game found in the area. Special mention may be made here of Bubulus bubalis Wild Buffalo (Junglee-Bhainsa). Though this magnificent beast has disappeared from many parts of Bastar, it is still found in two or three pockets of Bhairamgarh-Hingun-Jegur-Mingachal-Matewara tract, west of Kutru and Talperu-Chintavagu basin adjoining the Andhra State. It has been declared a "Protected species". Indravati National Park and Bhairamgarh and Pamed Game Sanctuaries have been formed in Bastar for the Protection of wild life with special attention to Wild Buffalo and Tiger.

The small game found in the area are Malabar Squirrel (Flying Squirrel), Jungle Fowl (Jungle Murgi) and Peak Fowl. The Hill Maina (Gracula religiosa) is a very famous bird of Bastar and is a matchless mimic of human voice. Bastar is the only place in peninsular India where this bird is found.

## History

The land mass of the district is quite ancient but its early history is in obscurity and very little about the area has come to light. Archaeological surveys and investigations have not so far been carried out systematically to unearth evidences regarding the antiquity and sociopolitical aspects of Bastar. Whatever little is known about the history of Bastar is by way of chronological reconstruction of events on the basis of inferences drawn from Sanskrit literature, contemporary rock inscriptions and sporadic researches based on copper plates, coins etc. found almost inadvertently in the region. Such a reconstruction of past based on scanty data naturally provides an incomplete, sketchy and discontinuous account of the history of Bastar. There appears to be some tenuous agreement among scholars that the present day Bastar region was part of Dandakaranya mentioned in Valmiki Ramayana. There is however, no such specific mention in ancient history. The Eitaraiya Bramhan has a reference regarding communities outside the fold of Aryan caste structure residing in the regions located south of the Ganga and areas along Narmada, Godavari and their tributaries. Aranyakand of the Valmiki epic contains detailed description of Dandak. Scholars of eminence like F.E. Partzitar and Cunningham have traced the routes taken by Lord Rama during his exile towards the south. Partzitar was of the opinion that Aryan saints had covered extensively various regions of the country from the north to the south and knew geographical locations of areas mentioned and described by them. In the Early History of the Deccan edited by Gulam Yazdani, Shri Anant Sadashiva Altekar has written a comprehensive article on the geography of the Deccan and has attempted to delineate the boundaries of Dandak from Tungbhadra to Mandakini of central India on the basis of Valmiki Ramayana. Shri Sundarlal Tripathi has tried to establish in his article published in Prachya Bharati that Indrawati of Bastar was in fact the Mandakini of Dandak and Chitrakut considered to be located in Dandak was the Chitrakut

of Bastar. He, however, distinguishes between the Mandakini of Bharat Milap and Mandakini of Dandak and is of the opinion that Mandakini and Chitrakut related to the epic meeting of Bharat and Ram was different than the Mandakini and Chitrakut of Dandak.

It is also claimed that during the period of early history Dandak was known as Chakrakut which included some portion of Jaypore region of present day Orissa State. The area of about 2,500 sq. miles comprising Kotpoda, Churchuneda, Rodagarh, Umarkot, Hamair Raigarh of Jaypore princely state was part of Chakrakut and continued to be the part of Bastar till the advent of British rule in the area.

However, the early history of Bastar when it was known by the name of Chakrakut is not clear owing to nonavailability of authentic records. There is also no direct archaeological evidence of Satvahan rule in Bastar but their rule in Chhattisgarh has recently been supported by a clay seal unearthed from excavation at Malhar. A coin of Satvahan ruler 'Apilaka' was found at Bilaspur. During this period it is possible that these rulers might have ruled the adjoining western and southern regions covering the region then known as Chakrakut.

The proceedings of the Indian Science Congress (1952) contained an article on prehistoric Bastar by Krishnamachari, V.D. After about two decades V.D. Jha of Sagar University claimed to have discovered stone age artifacts from twenty seven sites on the banks of rivers Indrawati, Sabri and Narmada. A few sites of tool factory, pebble tools and camping grounds have been identified around Pujari Kanker in Bijapur tehsil of south Bastar. Implements belonging to Middle Stone Age and made of Jasper, Agate and Flint have also been collected from several sites. The late Stone age sites come to light are few and the tools considered to be belonging to this age mainly comprise blades, scrapers etc. Pre-historic rock paintings have been claimed to exist in the caverns of Gupansar near forest village of Kotamsar in Kanger valley. Shri Jagdish Gupta and Shri N.S. Wakankar made this known earlier but have yet to publish the account or photographs. A neolithic cultural site has been identified near Garh Chandela about 70 km. north west of Jagdalpur. Some

megalithic monuments have also been discovered by V.D. Jha at Timmalwada, Handaguda, Sankanpalli and Nela Kanker in south Bastar.

About 350 AD Vyaghra Dev of Nala dynasty is said to have conquered northern parts of Dandakaranaya and founded his dynasty. This fact is corroborated by a historical record of the event relating to the conquest of south Koshal (Chhattisgarh) by Emperor Samudra Gupta, whereby he also subjugated the chiefs of Mahakantar (extensive forest area) in the south of south Koshal. The principal of these chiefs was Vyaghra Dev. The second King of Nala dynasty known to history as reigning over Bastar area was Bhavadatta Varman. The Edengra hoard (Kondagaon tehsil) of 32 gold coins worked with the figure of a bull distinctly reveals the name of a member of the dynasty with crescent in front and the legend 'Shri Arthapatrayasya'

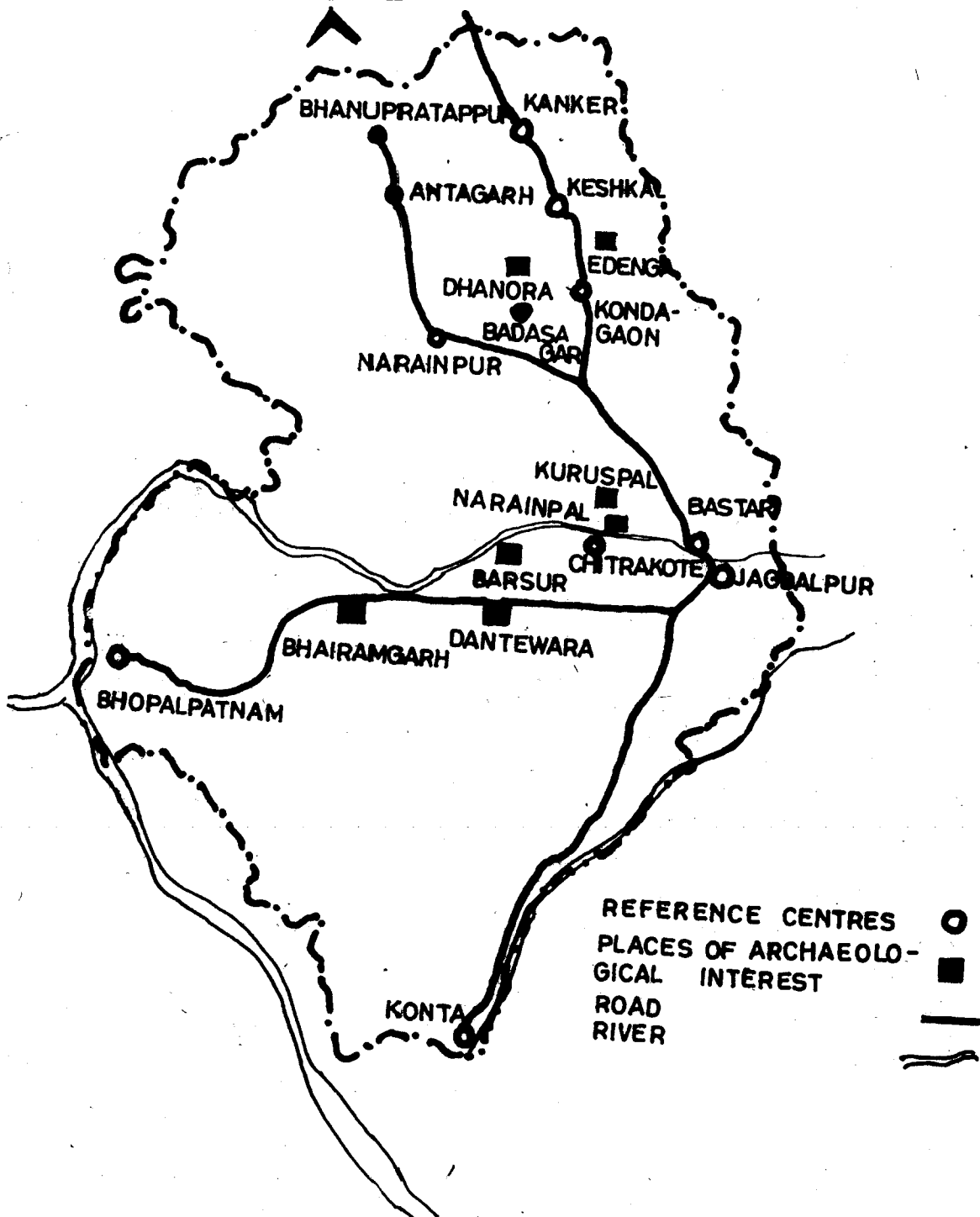
During and after the later half of 5th century AD the history of the adjoining area of Bastar was of fluctuating fortunes of Nala, Trikuta, Vakatkas and rulers of Sharabpuri. These dynasties were engaged in intermittent battles and skirmishes for the control of the area. It seems that rulers belonging to these dynasties ruled Bastar for short periods. Some more copper plates of the period belonging to Nala dynasty have come to light. What seems probable is some decisive outcome of the aforesaid turbulence in favour of some other dynasty, since thereafter, Nala dynasty seems to have passed into obscurity.

The area, thereafter, seems to have passed into the control of Naga dynasty known as Chhindaka Nagas of Chakrakot Mandala which is the old name of Bastar. These Chhindaka Nagas claimed to belong to Kashyap gotra. Their royal insignia consisted of a tiger with a cub and their banner was marked by the representation of a cobra (Phani Pataka). A number of inscriptions belonging to this ruling family have been discovered in Bastar region. The Naga Kings in these records describe themselves as the Lord of Bhogwati, the best of the cities. These Nagas gained strength and played a significant role during the 11th Century A.D. It appears that Chhindaka Nagas belonged to the



# IMPORTANT PLACES OF BASTAR

0 20 M



REFERENCE CENTRES ○  
PLACES OF ARCHAEOLOGICAL INTEREST ■  
ROAD —  
RIVER ~~~~~

same stock as the Sindas of Bagalkat and Yelburga of Bijapur district and Hallarpur and Belagutti of Mysore. Dr. D.C. Sircar has observed, "There is no doubt that the family name of Chhindaka preferred by the Nagavansis of Bastar is the same as Sinda of Kannada country."

The earliest known record of Chhindaka Nagas of Chakrakot according to Hira lal is a fragmentary inscription from Errakot about 16 km. from Jagdalpur. The name of the King referred in the inscription has been partly lost but it has been deciphered as Narpati Bhushan or Kshitibhushan. The inscription is dated in Saka year 945 corresponding to 1023 A.D. However, there exists evidence which proves the existence of Naga rule in this area long before the date of inscription. In the second half of the 9th century A.D. the Nagas were invaded by the eastern Chalukya King Vijayaditya III (A.D. 848 - 892) who claimed to have burnt the city of Chakrakot and captured the elephants of the King of Koshala who was apparently none else than the Somvansi king Janmejaya I (A.D. 850 - 885). This also indicates that Somvansis of Koshal were rendering help to Nagas of Bastar.

The army of Rajendra Chola of the South invaded Chakrakot in the year 1022-23 A.D. and occupied it. Although the decisive outcome of the invasion is not clearly known, there can be no doubt that Chakrakot came under the sphere of influence of the Cholas. No other record of Chhindaka Nagas till 1060 A.D. has come to light. The Barsur inscription of Telagu Chola feudatory chief Mahanandaleswar Chandraditya Maharaja dated in Saka year 983 corresponding to A.D. 1060 refers to Chhindaka Naga King Dharva alias Jagdekabhushan. Another King named Madhurantaka is known from the Rajpur inscription dated in Saka year 984 (A.D. 1065).

King Madhurantaka was ousted by Dharyarsha's son Someshwara I. The fragmentary Kuruspal inscription A.D. 1097, purports to testify that Someshwara killed Madhurantaka and assumed sovereignty of Chakrakot, through the grace of goddess Vindya vasini. The new King after his accession, continued the fight against the Chola King, Kulothunga I of Vengi. Both of them claimed victory over each other in their

respective records in the form of inscriptions. The most significant event of the reign of Someshwara was his invasion of South Koshala. The Kuruspal inscription testifies that he not only subjugated Bhadrappattana and Vajra but also occupied a large number of villages of Koshala. The Narayanpal inscription A.D. 1110-11 speaks of Kanhardeva, son of Someswardeva, as the ruler of Chakrakot. His dynasty continued to rule over Bastar upto 14th Century, A.D. The Nagas and their feudatories played a significant role in the history of Bastar and eastern Koshala. A large number of gold coins of Chindaka Naga rulers have been discovered which indicate their prosperous rule. They were great builders of temples and theirs was the golden age of Bastar.

The post - Naga Bastar was ruled by the eastern Chalukyas of Godawari region. Rai Bahadur Hira Lal in his book, Inscriptions in C.P. and Berar has published a genealogy of Raja Annam Deo whose lineage ruled Bastar from 15th Century onwards. Before the arrival of Annam Deo there was a nominal suzerainty of Warangal over most of the tribal organisation. The ruined temples at Barsur, Bhairamgarh, Dantewara, Kuruspal and elsewhere indicate an advanced Hindu civilization in the area directly administered by Telgu Nagvansi chiefs of Chakrakot. It was a country worth invading and inscriptions tell of many raids between AD 844 to 1150 by eastern Chalukya, Chola, western Chalukya etc. There are signs of Telangana villages that still survive like islands in the heart of Bisnorn Maria and Koya tracts chiefly in and around administrative and religious centres of the old Kingdoms such as Dantewara, Barsur, Bhairamgarh, Bijapur, and Jaggargunda. These Telangana people have now forgotten Telugu and speak Gondi or Halbi, observe Maria customs and festivals. In fact there is little to distinguish them from Marias.

After Annam Deo's arrival a curtain seems to have fallen upon this country, although legend speaks of Rajas of Tirathgarh, and of Annam Deo fighting to subdue the chiefs of Paralkot, Bhairamgarh and Barsur. History has little to relate about this period as the

existence of these Kings had practically no effect upon the history of the adjoining areas. They tended to live in isolation and had few dealings with the outer world from 1450 A.D. to 1860 A.D. In 1750 A.D. the Maratha army under Nilu Pandit intervened on behalf of the younger brother of Raja Dalpatdeo and captured Bastar but only to be surprised and cut to pieces by Dalpatdeo. Again in 1780 Daryao Deo had to seek Maratha help and bound himself to pay annual tribute to Bhonsale Raja of Nagpur. But Bastar chief retained full independence within his territory. Owing to these unsettled conditions the chiefs or Rajas of Bastar had to shift their capital from one place to another seven times. The capital from Bastar to Jagdalpur was shifted after 1750 A.D. This also appears to be the reason for a loosely knit administration of the area in the past, utter lack of road communication and absence of settled cultivation.

Rai Bahadur Hira Lal in his geneology of Annam Deo whose lineage ruled Bastar from 15th Century onwards, mentions ten descendents from Annam Deo to Digpal Deo and eight descendents thereafter from Rajpal Deo to Rani Prafulla Kumari. According to the Feudatory States Gazetteer Annam Deo died in Samvat 1415 that is in 1473 A.D. In his book Maria Gonds of Bastar Griegson accepts Annam Deo to have established his princely rule in Bastar in 1424 A.D. With the beginning of Annam Deo's rule Chakrakot came to be known as Bastar. The family of the Raja of Bastar is ancient and is said to have come from Warangal in Andhra Pradesh at about 1320 A.D. when muslims extended themselves forcefully in that area and caused these rulers to flee from there towards the north of Godawari. According to the traditions of the family, Annam Deo established himself in Bastar under the protection of goddess Danteswari. In 1853 it came into direct political relations with the British. The last Raja in the line was Pravir Chandra BhanjDeo who ruled the State till its merger with Madhya pradesh.

The area of present day Bastar district was then divided into two feudatory States of Bastar and Kanker. Bastar State consisted of

5 Tehsils and 4 Zamindaris, while Kanker State was a homogenous unit having two tehsils.

The administration of Bastar State was carried out by the Maharaja as head of the State and he was assisted by a Diwan. The Diwan had powers of a District and Sessions Judge and he carried out his functions with the assistance of two subordinate Judges. The State for purposes of administration was divided into 5 tehsils viz. Narayanpur, Kondagaon, Jagdalpur, Bijapur and Konta and 4 zamindaries viz. Kutru, Bhopalpatnam, Pamed and Sukma. Originally there were 7 zamindaries but three of them got subsequently merged in Bastar State. The Tehsildars and Managers had power of a Munsiff and were enjoying the powers of a second class magistrate.

The land record department consisted of one District Revenue Inspector, 4 Revenue Inspectors and 33 Patwaris. One Patwari had about 60 to 70 villages under his charge and one Revenue Inspector had 8 to 10 Patwari circles in his jurisdiction.

The people of the area are simple, honest and are not usually given to litigation. Nevertheless, the Civil, Criminal Procedure codes and the Indian Penal Code were in operation and Stamp, Limitations and Excise Acts were also in force. The whipping Act, Cattlepond Act and Court Fees Act were also followed as far as possible. The police force consisted of one Inspector, 3 Sub-Inspectors, 9 Chief Constables, 48 Head Constables and 274 Constables. One member of the police force had to look after about 948 persons and had to cover about 96 sq.km. of territory. In addition one officer, 2 head constables and 24 constables, formed the reserve force at the capital. The State was having 10 police station and 26 outposts.

The system of land revenue was on the basis of plough. Writing in 1856 Captain Elliot stated that the land tax was levied like Chhattisgarh on the plough and the tax varied from eight annas to one rupee (present day Rs. 0.50 to Rs. 1.00). In many parts of the State plough was not used and soils were cultivated specially in

hilly terrain by an instrument called Korki which resembled a hoe. Tax rate on a hoe ranged between four annas to eight annas (present day 25 paise to 50 paise). Mr. Chapman wrote in 1898 that the whole State was divided into parganas which were under paid officials who exercised civil and criminal powers besides collecting land revenue. The wild and distant parganas were for purposes of revenue collection under Thanedars, Negis or Hikmis. These officials were paid officers and they had under them paid servants who received a monthly payment. The system of land settlement was of the crudest description. The unit of measurement was 'nagar' representing the area of land which could be kept under cultivation with a pair of bullocks during one season. A plough was considered to be equal to 10 to 12 acres. Periodical assessment were made by collecting information from neighbouring villages about the number of cattle actually used by each cultivator in the area. Money was practically unknown and all payments which were not made in kind were paid in Cowries. The rate of assessment throughout the State used to be five dogani of cowries which is equivalent to 50 paise per plough. Rupee as a currency was first introduced in the State in about 1865 when the teak timber of the district found a market in Madras.

Mr. Barry in a letter to the Commissioner, Chhattisgarh wrote that the first Malgujari settlement was made in Samvat 1924 corresponding to 1867 AD and ploughs then existing were enumerated and all ploughs belonging to both Ryots and Malgujars were assessed for a period of five years. The rates were Rs. 2.25 in cash, Dhan (Paddy) 2½ khandis, Urad 5 paillies and oil 2 seers. The next settlement was carried out in Samvat 1929 corresponding to 1872 AD on the basis of ploughs enumerated earlier in 1867. The rates were revised to Rs. 3 in cash and Dhan 3 khandis but the quantities of other items remained the same. The enhancement was withdrawn owing to objections from the people. Again in Samvat 1934 (1877 AD), a ten year settlement was made based on the number of 1867 ploughs. The rates were raised to Rs. 3 in cash, dhan 3khandis and the quantity of urad and oil remained

same as before. The enhanced demand entirely fell on Ryots and Malgujars and Thekedars were immensely benefited. In Samvat 1936 corresponding to 1879 AD a reenumeration of ploughs was again attempted, but finally the number as arrived at in 1867 was made the basis of assessment. The rates were enhanced to Rs. 3-15-0 (Rs. 3.94) in cash but quantities of other items remained the same. However cash raise was again reduced to Rs. 3 on representation by Ryots. In December 1897, a cadastral survey of the whole area was commenced with a view to arriving at a regular settlement but this remained confined to the most fully developed areas of Jagdalpur Tehsil. For the rest of the State assessment on the basis of plough was adopted. In 1898, a summary settlement of the State was completed by Rai Sahib Pandit Alamchand and new rates fixed per plough were between Rs. 4 to Rs. 7 in cash. A share of 20 to 25 per cent of the village assets was guaranteed to the village headman.

It would thus appear that both the land revenue and system of settlement were against the cultivators and extremely favourable to Thekedars and Malgujars. The amount of cash rent and levies in terms of commodities were too much for the tribal cultivator and it is no wonder that tribals did not improve the way of their cultivation. The system also worked against the State, since the settlement was done on the basis of the number of ploughs enumerated in 1867 and the Thekedars collected land revenue on the basis of ploughs actually used in the village at the time of sowing.

However, the tenure was simple. A Ryot could not be dispossessed as long as he paid his rent timely. The rents could not be enhanced during the currency of the settlement. Cultivator could have sublet his land with the consent of the Thekedar but such sublease would not operate beyond the settlement period or dispossession of the leasee. No new Ryot could come into the village without the consent of the Thekedar and similarly no new land could be broken without his prior consent. The Thekedar was allowed to have 3 days

free labour from every Ryot every year. Thekedar was not permitted to transfer his village. If a Thekedar held the village for more than 12 years and had improved the willage, he was given a protected status while others were liable to be ejected. The Zamindar also could not transfer any land or village by sale, gift or mortgage without prior permission of the Raja of Bastar. The State also gave revenue free grants to the members of the ruling family, Danteshwari temple and other important temples.

The State also levied taxes on drinking water known as Panpai, Patwari cess, Dashera, Tikka etc.

The administration of Kanker did not differ substantially from that of Bastar. The Raja of Kanker had full revenue, civil, and criminal powers. He was assisted by a Diwan who had judicial powers. For purposes of administration, the State was divided into two Tehsils viz. Kanker and Sambalpur (present day Bhanupratappur) under the Tehsildars. The Tehsildar was assisted by a Naib Tehsildar. The administration of land records was carried out through the Inspectors and Patwaris. Indian Penal Code, Criminal Procedure Code Civil Procedure Code and Acts relating to evidence, excise, limitations, forest and court fee were also in operation. There were two police stations and five outposts. The police Department was manned by one circle inspector, two sub-inspectors, one court inspector, 13 head constables, 3 lance constables and 55 constables. The method of land revenue settlement in Kanker was practically the same as in Bastar. The unit of assessment was "the plough" but one plough was equivalent to an area of 11and which 2 pair of bullocks could cultivate. There was no system of Thekedar. The village headman used to collect revenue and deposit into the State treasury directly. The land revenue assessed per plough varied from Rs. 4 to Rs.30. Tenants were required to pay cash rental ranging from Rs. 2.50 to Rs. 7 per plough. In addition Rs. 1.50 was also taken in kind per plough. Other taxes included forest dues at the rate of 50 paise



per plough, Patwari and school cess equivalent to 1/16 of total deposits of village and Begar or free labour worth one rupee per year per Ryot. Rakhi and Daahara Tikka and some other general taxes such as Haldi Sari, Lal tika, Churitax etc. were also levied on special occasions. There was also some sort of sales tax levied on sales in markets and which was known as 'Ughai'.

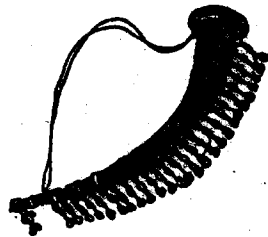
This state of affairs continued upto the merger of these States in the former M.P. State. The district in its present form was constituted in 1948 by merging feudatory States of Bastar and Kanker and it was named after the former of the two merging feudatory States. With the formation of the district most of the rules regulations, procedures as were applicable in other parts of the State were made applicable to Bastar. The district was administratively constituted of 8 tehsils.

There are 26 Revenue Inspector Circles and 378 Patwari halkas. For development purposes the district has been divided into 32 development blocks. The Integrated Tribal Development Agencies have been constituted and located at tehsils headquarters. The entire district has been made part of the tribal sub-plan area. Looking to the exigencies of administration and the development needs of the area, particularly in view of the predominance of tribals the district has been accorded a higher status by declaring it a revenue division under the charge of a senior officer belonging to Indian Administrative Services. The District was declared Revenue Commissionery on 16th February, 1981. Subsequently, with a view to decentralising the administration further a few more tehsils have been added viz. Bhopalpatnam(8.1.82) Antagarh (11.2.82) and Charama(31.7.82). The District is now having full complement of administrative and development functionaries covering sectors like Agriculture, vCooperation, Medical and Health, Irrigation, Building and Roads, Public Health Engineering, Forest, Animal Husbandry, Fisheries, Horticulture, Power and Industry. These sectors are being supervised and guided by senior state service personnel. The District now has a regular Superintendent of Police

of the cadre of Indian Police Services. There are 27 police stations in the district. A Bastar Development Authority has also been constituted with a view to formulating and implementing development plans with proper strategies as may be required by the standards of people and compulsions of the area. In short the district has now entered the main stream of administrative and development activities.

The concept of the village is based on the production function. It is a cluster of producing household units which have assembled within a given territory either on account of clan, community or mutual production interdependence. The whole structure of administration arises out of such existence of producing units. The district being tribal dominated area it possesses characteristically tribal habitations. They are widely scattered, mostly small in size and are generally monotribe settlements which have sprung up according to the needs of the producing communities. The villages, particularly smaller villages do not manifest heterogeneity. The concept of a revenue village when applied to these widely scattered human habitations results in the formation of the main village with a single or a number of satellites. The emphasis of revenue and development administration being different often produces contradictions if viewed from only one amalgamated point of view. Presently there are 3,388 inhabited revenue villages in the district, out of which about 55 per cent are single whole village units while the remaining about 45 per cent villages are multiunit settlements having one or more subsettlements. As against the total number of inhabited villages there are 7,033 inhabited sub-settlements or hamlets. The development problem would thus be seen in the context of total human settlements which would number 10,371 inhabited settlements. The administrative need of all these settlements can be met by forming groups of villages but developmental needs particularly infrastructural facilities and some of the social inputs have to be provided to all the settlements keeping in view the terrain and distances involved between human habitations.

The urban area in the district covers about 54 sq.km. which includes Jagdalpur, Kondagaon and Kanker towns. Kirandul and Bachel area under the Bailadilla Iron Ore Project is non-municipal urban area. Kanker, Kondagaon and Jagdalpur which is also the headquarter of revenue division and district, are towns having municipalities.



## RESOURCES

### Land

The land is the primary resource which provides for most of the other physical resources. The land itself, apart from the source of other material assets, is harnessed into raising agricultural, horticultural and fodder crops which are essential for the sustenance of both human and animal life. The district, with its characteristic undulating land surface has denuded top lands with the deposition of soils in the valleys. Soils of the districts pertain to laterite and alluvium categories. In the greater part of the district light clay soils with an admixture of sand are generally found. Yellow and red soils found on hill tops and plateaus are deficient in nitrogen, phosphoric acid and lime. Primary laterites are found as a cap on the top of the trap and gneissic rocks and are poor in nutrients. Secondary laterites are usually found in valleys and low lying lands. Soils are not usually very deep and possess little natural fertility. The configuration of the country is generally a succession of undulating ridges with intervening valleys. The valleys certainly contain some admirably suitable land for cultivation but the ridges and slopes which form by far the largest proportion of the area are covered with thin stony yellow soils which do not look very promising for cultivation.

The total geographical area of the district is 3911400 hectares, out of which 2470600 ha. is under forest and 5400 ha. form the urban area of the district. The forest constituting about 63 per cent of the total geographical area emphasises the richness of the district in forest wealth. Out of the remaining land as per 1981-82 land use statistics, about 81,000 ha. are under non-agricultural uses and about 125,900 ha. constitute barren and uncultivable waste land. These two categories put together form about 5.3 per cent of the total non-urban land area. The area under permanent pastures and other grazing

land is 152,200 ha. It appears that about 3,59,100 ha. of land is thus not available for agricultural purposes. Out of the balance of 10,76,300 ha. 168,800 ha. has been classified as culturable waste and about 54,700 ha. is under old fallows. Thus, there remains about 852,800 ha. of land which constitutes cultivated and current fallows. Assuming that the entire land under culturable waste would be brought under cultivation with increasing pressure of the demand for foodgrains and other agricultural outputs, the maximum total land available for cultivation would be about 10,21,600 ha. In terms of percentage the availability of land for agriculture purposes would be limited to about 27 per cent of the total non urban land area. The net area sown during 1981-82 was 806,900 ha. which in the coming years can be increased upto 10,21,600 ha. with the assumption that forest area will not be reduced and all the available land area under culturable waste would be made suitable for agricultural operations by taking up various conservation and development measures. It is felt that extra area in addition to the above estimated cultivable area above can not be brought under cultivation without disturbing the area under forest. It may however be pointed out that the area under forest, should not be reduced for the purposes of increasing the availability of cultivable land owing to the importance and role of forest in maintaining ecological balance. The district is one of the few areas in the country where good and considerable forest is still available. Such type of energy capturing green reserves are becoming rare on this biosphere. It would, therefore, be advisable to make every effort for preserving and maintaining, of course, with proper working, the existing forest reserve in the region. With the availability of modern technology and yield increasing inputs, it should not be difficult to produce additional food requirements from the existing area under cultivation and the additional availability as per estimates above.

Demand for fodder is increasing day by day with the increase in livestock population. The grazing pressure on the already denuded land is resulting into its further deterioration. To meet the quantitative

and qualitative demand of fodder the area under barren and uncultivable waste land and other grazing lands can be made use for development of pastures. This would help in the conservation of soil as well as increase in the supply of quality fodder to the growing livestock population. Area available in the district for this purpose is 278,100 ha. Part of this land may be made available for industrial purposes also as and when need arises.

For the development of horticulture 54,700 ha. of land under old fallow can be utilised. Depending upon the suitability and need, part of cultivable waste land can also be taken for horticulture development purposes.

Thus, based upon the existing land use pattern the eleven tehsils of the district can be categorised into following three groups for taking up various developmental programmes :

#### I. Forest Intensive Programmes.

1. Kondagaon
2. Narayanpur
3. Antagarh
4. Bijapur
5. Bhopalpatnam

#### II. Agriculture Intensive Programmes.

1. Kanker
2. Charama
3. Jagdalpur
4. Kanta
5. Bhanupratappur
6. Dantewada

#### III. Pasture Development and Animal Husbandry Programme.

1. Jagdalpur
2. Kanker
3. Charama

#### 4. Bhanupratappur

Bastar district has a livestock population of over 1.76 million (Livestock and Animal Statistics, 1981-82) which is equivalent to 1.25 million Adult Animal Cattle Units (ACU)\*. The requirement of dry fodder by an ACU is 2.6 metric ton per year. Thus, the present annual requirements of dry fodder by the livestock population in the district is 3.25 million metric ton, whereas at present the estimated production of forage and fodder from barren and uncultivable land, permanent pastures and other grazing lands, protected forest land, cultivable waste land, old fallows and crop residues of Jowar, Maize, Wheat and Paddy is 2.15 million metric ton per annum. Production of forage in reserved forests and from fodder trees has not been included in these estimates. Thus, there exists annual deficit of 1.10 million metric ton of dry fodder in the district.

#### **Water resources**

The district is rich in water resources. It is drained by the Godavari and Mahanadi basins. As compared to Godavari basin, the Mahanadi basin is quite smaller, covering only Kanker tehsil. Main rivers of Godavari basin are Indrawati, Godavari, Sabri, Tel, Narangi, Gudra, Nei Bharat, Kotri, Dantewada and Dudh. Most of the rivers are perennial and swell up after receiving rains during the monsoon months. Volume of the water subsides during winter season and they flow gently.

Total drainage area of the district is 39114 sq.km. Out of which Godavari basin (36,474 sq. km.) is constituted of Indrawati, Sabri and Lower Godavari sub-basins of 26,554, 5,680 and 4,240 sq. km. drainage area, respectively. The drainage area of Mahanadi basin in the district is 2,640 sq. km. Longest river which flows across the district is Indrawati covering a length of 372 km. whereas the lengths of Sabri, Godavari and Mahanadi rivers flowing through the district are 180, 24 and 64 km. respectively.

Average annual rainfall of the district is 1485 mm. Rainfall is recorded at various rainguage stations in the district. The average

\* ACU is equivalent to 250 Kg. live body weight of the animal.

rainfall values and dependability of rainfall at 50 per cent, 75 per cent, and 90 per cent level of nine stations are given below :-

Dependability of rainfall

S.No.	Name of rain gauge station	Average rainfall ( mm )	Dependability at		
			50 per cent	75 per cent	90 per cent
1	2	3	4	5	6
1.	Bhanupratappur	1377	1436	1304	915
2.	Narayanpur	1389	1408	1186	957
3.	Kondagaon	1411	1373	1253	1023
4.	Keskal	1517	1464	1388	1041
5.	Jagdapur	1439	1469	1336	1091
6.	Dantewada	1412	1380	1247	922
7.	Bijapur	1560	1591	1395	1082
8.	Bhopalpatnam	1601	1660	1346	1123
9.	Sukma	1336	1332	1151	1015

Dependability at 50 per cent and 90 per cent is highest at Bhopalpatnam, whereas the lowest dependability at 90 per cent is at Bhanupratappur, followed by Dantewada.

**Surface water**

The annual inflow data is recorded at four gauge discharge sites in Indrawati and Sabri sub-basins located at Jagdalpur, Chitrakot, Konta and Incharam. In Mahanadi basin gauge discharge site is located at Arod, but the figures are not available of this site. The annual inflow data at four gauge discharge sites are readily available for the period 1966 to 1971 which are produced below :-

Sub. National Systems Unit,  
National Institute of Educational  
Planning and Administration  
17-E, Sri Aurobindo Marg, New Delhi-110016  
DOC. No.....S.N.S. 1029  
Date.....19/1/87



Annual in-flow ( $Mm^3$ ) series at four gauge discharge sites of Indravati and Sabri rivers of Godavari basin in Bastar district for the period 1966 to 1971.

S.No.	Year	Sub-basin			
		Indravati		Sabri	
		Jagdapur	Chitrakote	Konta	Incharam
1	2	3	4	5	6
1.	1966	3884	5637	15267	7199
2.	1967	5636	5952	14948	9544
3.	1968	3750	4120	10810	6788
4.	1969	5193	6293	16931	11746
5.	1970	4609	4380	14637	10241
6.	1971	3509	4227	10173	6651
Average in-flow		4430	4900	13794	8695

This data is not sufficient for computation of yield for the whole catchment area. From the observed rainfall series, the 75 per cent dependable yield has been worked out for different river basin of the district which varies from 0.39 to 0.48  $Mm^3/sq.km.$  By using this yield factor total yield of the district works out to be 18365  $Mm^3$ .

Sub-basin	Catchment area in district (sq.Km.)	Yield rate ( $Mm^3/sq.km.$ )	Total Yield ( $Mm^3$ )
1	2	3	4
1. <u>Godavari</u>			
(a) Indravati	26560	0.48	12710
(b) Sabri	5700	0.46	2632
(c) Lower Godavari	4620	0.47	1997
2. Mahanadi and tributaries	2660	0.39	1026
	39180	0.45	18365

## Ground Water

In some of the blocks of Bastar district geohydrological surveys have been carried out. According to the latest norms for ground water assessment the ground water recharge in the district is  $8,820 \text{ Mm}^3$ . If 50 per cent of the ground water recharge is taken into consideration as net recharge, which can be utilised for different purposes, then the ground water availability would be  $4,410 \text{ Mm}^3$ . The present annual draft is  $61 \text{ Mm}^3$ . Therefore the balance available of the ground water for future development in the district would be  $4,349 \text{ Mm}^3$ .

## Utilisation of water resources

Water resources are mainly utilised for irrigation, generation of hydel power, fisheries and industrial purposes. Considering the availability of water resources in the district there exists very good potentiality to exploit it for irrigation, power generation and development of fisheries.

### 1. Irrigation

The district has got vast water resources which can be utilised for irrigation purpose. The quantum of surface water availability for consumptive use in the district is  $18,365 \text{ Mm}^3$ , calculated at 75 per cent dependability through Indrawati, Sabri, Lower Godavari and Mahanadi rivers, whereas, the availability of the ground water has been estimated at  $4,410 \text{ Mm}^3$ . Regeneration by assuming a recharge of 10 per cent of water from irrigation use works out to  $137 \text{ Mm}^3$ . Thus, the total availability of the water through surface, ground and regeneration works out to  $22912 \text{ Mm}^3$ . This water resource is adequately sufficient to meet the irrigation needs of the district. About 1000 thousand hectares of land can be brought under irrigation through this source which makes about 27 per cent of the total geographical area of the district.

The total irrigation potential created in the district by the government sources and Dandkaranya Authority till the end of June 1982 is 42,704 ha. through nine lift irrigation schemes, two medium projects and 205 minor projects. The potential created through private sources is estimated at 5380 ha. during the same period. Thus, a total irrigation potential of 48,084 ha. has been created in the district upto June 1982 which is likely to consume  $392.26 \text{ Mm}^3$  of the water resources.

By the end of the Sixth Five Year Plan the additional irrigation potential of 35,696 ha. is likely to be created which will make total irrigation potential of 78,400 ha. in the district. The total consumptive water use for this created irrigation potential would be  $630.40 \text{ Mm}^3$  thus leaving a balance of  $22,281.60 \text{ Mm}^3$  for future exhibition.

The net area sown in the district is 781,200 ha. which is about 75 per cent of the total culturable area available. The area under irrigation is 11,980 ha. which is 1.50 per cent of the net area sown. However, the statistics obtained from the Irrigation Department shows total irrigated area from government sources as 1.85 per cent of the net area sown. If irrigation from private sources is added it will be improved to about 2.4 per cent which is too low, particularly when there exists a potential of 5.3 per cent from government sources alone.

## (2) Generation of hydel power

The district has got an immense potentiality to generate hydel power. Increasing demand for power in the State, in future, can be well supplemented by using the hydel potentials of the district.

Indrawati basin has a large potential for hydel power generation. The total potential is estimated to be around 3,650 Mw to be generated through ten major hydel power generation projects. The sites of these projects and their potential are : Chitrakote, (45 Mw), Matnar (80), Bodhghat (500), Kutru I (150), Kutru II (150), Nugur I (150), Nugur II (600). Kotri-Kodur (150), Matti Marka-Bhopalpatnam or Indra Sagar (1225), and Inchampalli (600). Out of these ten projects, Nugur II, Kotri Kodur and Matti Marka are inter-state projects

with Maharashtra state, whereas Inchampalli is with Maharashtra and Andhra Pradesh States. Bodhghat project is located at about 8 km. from Barsur and work has already been started on this project. Apart from the potential of Indrawati basin the district has additional hydel potential for generating incidental power on small rivers owing to the falls of water of exploitable heights due to hilly topography. Generation of such incidental hydel power would be for limited period in a year but in some cases it can be possible to generate power throughout the year by constructing small dams.

There are few ideal sites for pumped storage schemes due to the proximity of high level upper reservoir sites on fringe of the power project reservoirs. The ratio of height to the length of the water conductor system is small in these cases which makes the pumped storage scheme technically viable and financially economical. The survey and investigation of actual schemes for mini hydel power generation has to be taken up to know the potential of incidental hydel power. However, the preliminary estimates show that the approximate power generation from six identified mini and micro projects in the district would be around 4,125 Kw.

### **(3) Fisheries Development**

In Bastar district vast resources of culturable water areas such as tanks, ponds, irrigation reservoirs, etc. are available for the development of fisheries. The assessment for the water wealth, from the point of view of fisheries development, can be divided into three parts : (a) village ponds, (b) man made lakes, and (c) natural river system.

The district has two major river systems the Godavari and Mahanadi. Godavari basin covers about ninety three per cent of the total area of the district. Other important rivers of the district are Markande, Narangi, Guda, Dankini, Sankhini, Chintawag, Nibra, Kotri, Doodh etc.

There are about 3,330 village ponds spread over 27 blocks covering 8,301 ha. area under water. Number of irrigation tanks/ reservoirs are 133 in 26 blocks, covering an area of 9,327.84 ha. Thus, the total estimated productive area in the district from the above mentioned area would be 13,826 ha. But the availability of water in some of the village ponds is seasonal and these are not suitable for pisciculture. Therefore, presuming that 25 per cent of the village ponds will not be available for this purpose and thus, the net culturable area available in the district would be 11,725 ha. the Department of Fisheries has set the target to cover an area of about 4,437 ha. of irrigation tanks by the end of the Sixth Five Year Plan. Therefore, the potential area available for fisheries development in future would be 6,200 ha. under village ponds and 1,088 ha. under irrigation tanks.

For pisciculture development fish seed of good quality should be made available. The present level of production of fish seed in the district is 90 lakh fry, whereas the future demand would be around 240 lakh fry for implementing development programme. At present five fish seed farms have been established at Kanker, Charama, Jagdalpur, Balinga and Pakhanjore. The triabl sub-plan was initiated in 1976-77 and till the year 1982-83 the number of tanks stocked were 157 with 74.39 lakh fry which approximately yielded 60.51 tonnes of fish.

There exists a vast potential for the development of Fisheries in the district. An integrated approach should be adopted, with the active involvement of the tribals, for the success of the programme. It should be linked with the establishment of hatcheries for production of fish seed, development of village ponds, tanks, reservoirs and riverine fisheries, training programmes, adequate storage and marketing facilities to get optimum benefits.

### **Forest Resources**

Bastar region is very rich in forest wealth. Out of the total geographical area of 39,114 km. of Bastar district, the area under

forests is 24,706 km. which is about 63. per cent of the total geographical area. This represents 3 per cent of the country's and 13 per cent of State's forest area.

According to the revised survey of forest types of India by Champion and Seth (1964) the district of Bastar has following five types of forests :

- (1) Moist Peninsular Sal
- (2) Southern Moist Mixed Deciduous
- (3) Moist Teak Forests
- (4) Dry Teak Forests
- (5) Southern Dry Mixed Deciduous Forest.

### 1. Moist Peninsular Sal

The vast stretches of Sal dominating forest areas are confined to the northeastern parts of Bastar district in Keshkal and Kondagaon regions. The ecoclimate of this region is dry subhumid. Sal; the dominant species of the overwood, constitutes 61.1 per cent of the total stand, forming nearly pure stands in patches but its percentage distribution decreases in very moist localities, on hill slopes, hill tops and rocky areas. The common associates of Sal are Terminalia tomentosa-sin (5.2), <sup>1</sup>Petrocarpus marsupium-Bija (4.7), Anogeissus latifolia-Dhawada (4.3) Dilospyros melanoxydon-Iendu (4.3) and Mangifera indica-Amba (1.1). Thus, only eight species make 86.7 per cent of the total stand. Occurrence of bamboo as an understorey is a common phenomenon in the forest areas south of Indravati river but it is conspicuously absent from the forest areas of East Bastar. Variations of site quality of Sal exists from All India I to III but major area belongs to II quality. The crop is generally healthy and vigorous. Dry rot in Sal trees is rare. Seedling regeneration of Sal is adequate over the major area. Regeneration is inadequate on drier patches, adjoining areas of the villages and bamboo infested

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1. Botanical names are followed by local names and figures in parenthesis are percentages in relation to total stand.

areas. Enumeration results indicate that in sal areas, on an average, there are 560 trees (5 cms. and over in diameter at breast height) standing per hectare out of which about 400 trees are sound, 110 trees half sound and 50 trees unsound.

### (2) Southern Moist Mixed Deciduous

This type occurs along the water courses, damp valleys and hill slopes and mostly confined to moist subhumid zone comprising south eastern parts of the district. The density of the canopy varies from 0.5 to 0.9 but even full stocking is quite common. Variations in site quality exists from All India I to III but major area belongs to II quality. The forest crop is usually over-mature and unhealthy with scattered big size trees.

These forests have variety of floristic composition depending upon lithological and adaphic factors. Percentage composition of the species is not available. The important species of the overwood are Sal and Teak (in small percentages). Other constituent species are Terminalia tomentosa, Pterocarpus Marsupium, Adina cordifolia, Anogeissus latifolia, Mangifera indica, syzygium cumini, Salmalia malabérica, Mitragyna parviflora, Schrebera swietenoides, Garuga pinnata, Lagerstroemia sp. and Dalbergia latifolia.

The understory contains Schleichera, oleasa, Lanea grandis, Careya arborea, Diospyros melanoxylan, Emblisa officinalis Morinda tinctoria etc. Dendrocalamus strictus and Bambusa arundinacea are the typical bamboos at the drier and moister ends, respectively.

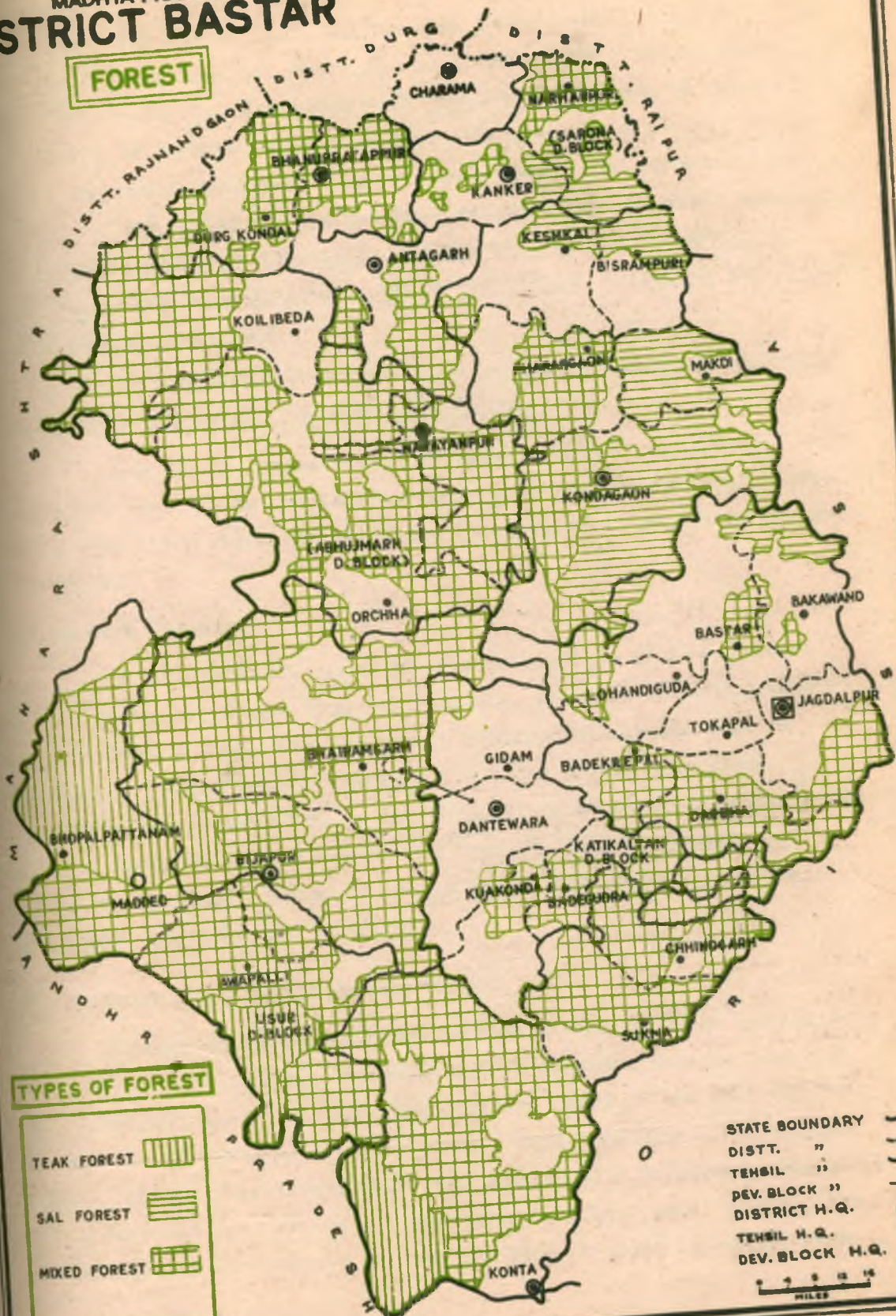
Moist mixed deciduous forests have not been worked out in the past. These forests contain high percentage of mature and overmature trees. In absence of improved fellings and thinnings the trees have grown wild with rampant climber growth and undesired branches.

### (3) Moist Teak Forests

Moist Teak forests occur in patches in the humid ecoclimatic zone around Bhopalpatnam region, Usur hills and southwestern parts of Konta tehsil. Teak is the most characteristic and valuable species which attains its finest development on suitable soil and geological

# MADHYA PRADESH DISTRICT BASTAR

## FOREST



### TYPES OF FOREST

TEAK FOREST	
SAL FOREST	
MIXED FOREST	

STATE BOUNDARY

DISTT. "

TEHSIL "

DEV. BLOCK "

DISTRICT H.Q.

TEHSIL H.Q.

DEV. BLOCK H.Q.

0 2 4 6 8 10 12 14  
MILES



formation. The belief that teak has got a preference for basic geological formations and soils is widely prevalent. In the more moist parts where teak is associated with Bambusa arundinacea or dense understorey of Dendrocalamus strictus, the proportion of teak is low and its natural regeneration is extremely poor. The percentage composition of these forests has not been worked out. The other associates of teak are Terminalia tomentosa, Pterocarpus marsupium, Dalbergia latifolia, Anogeissus latifolia, Adina cordifolia, Mitragyna parviflora and Salamalia malabarica.

The middle storey consists of Embluca officinalis, Buchnanian lanzan, Careya arborea, Cleistanthus collinus, etc.

Absence of regeneration of valuable timber species is conspicuous and may be due to heavy undergrowth and occasional fires. Teak regeneration which can withstand these harmful factors is present in patches.

#### (4) Dry Teak Forests

In dry subhumid type of climate dry type of teak forests occur. Bamboo is absent from such regions, which is the characteristics of moist type of teak forests and is replaced by grasses such as Andropogon, Saccharum and Erianthus. But the climax dry type of teak is characterised by a fair proportion of bamboos in the understorey. Important associates of dry type of teak are Anogeissus latifolia, Buchnanian lanzan, Bauhinia malabarica, Sterculia urens, Terminalia bellerica and T. chebula.

#### (5) Southern Dry Mixed Deciduous Forest

There is an interesting overlap of the southern and northern forms of the tropical dry deciduous forest characterised by teak and sal respectively in the northern parts of the district in dry and moist subhumid climatic zones. This represents the 'ecotone' or the 'tension belt' zone where two species with different ecological characteristics are trying to gain supremacy over each other. The main associates of teak and sal are the same as given under dry teak

forest type. Percentage distribution of the tree species has not been worked out in these forests.

### Plantations

In Bastar district plantations of Eucalyptus, Teak, Bamboo and Pine has been taken up by the Forest Department. Upto the end of fourth plan period Eucalyptus was planted in more than 10000 ha. area. Forest Development Corporation started Experimental Tropical Pine Plantation Programme in the district in 1975-76 and 1600 ha. area has been planted upto the year 1981. Later on this scheme was abandoned.

A pre investment survey (PIS) of forest resources was conducted between 1965 and 1972 to investigate the economic availability of raw materials. The findings of the pre investment survey have indicated superiority of Bastar district, with 3 per cent of the country's forest area, in terms of growing stock of timber and bamboo. The estimated growing stock in the district, according to PIS, is to the tune of 187 million  $M^3$  which works out to some 7 per cent of the total growing stock of the country. The Bamboo potential has been estimated as 4.2 million tonnes. The potential annual cut from these forests works out to nearly 3.14 million  $M^3$  of timber and fuel and 0.32 million tonnes of Bamboo. As has been stated earlier the forests in the district can be broadly classified as teak, Sal and Mixed types which contain almost all the assortment needs to cater to the demand of various forest based industries. The average assortment of annual cut of 3.14 million  $M^3$ , in major utility classes from these forests is estimated as 2 per cent special size timber of Sal, 2 per cent plywood and veneer logs, 18 per cent sawmilling material, 8 per cent poles and small timber and some 70 per cent pulpwood and fuelwood. These figures may vary for each forest type individually but they certainly provide an indication of tremendous potential for exploitation. The annual potential of pulpwood would be nearly 2.2 million  $M^3$ , but all this material can not be useful because of the limitation of Bamboo occurrence. Taking the annual Bamboo potential as 300000 tonnes (after allowing for local consumption), and the ratio of Bamboo to pulpwood as 60 : 40, the

availability of pulp would be 200000 tonnes per year.

Three industrial catchments comprising the middle zone of Bastar district can be demarcated. These catchments are Jagdalpur, Barsur and West Bastar. Some of the main features of the inventory of these catchments are as follows :

Name of Catchment and area in Km <sup>2</sup>	Forest Type	Mean Gross volume M <sup>3</sup> /ha.	Mean error per cent at 95 per cent probability level
1	2	3	4
1. Jagdalpur 2754 Km <sup>2</sup>	Sal	89.81	15.4
	Teak	102.30	27.6
	Miscellaneous	56.84	24.6
	Others	-	-
	All	81.08	12.9
2. Barsur 2454 Km <sup>2</sup>	Sal	96.19	10.5
	Teak	72.68	25.2
	Miscellaneous	68.50	10.04
	Others	5.12	168.5
	All	79.79	7.7
3. West Bastar 4385 Km <sup>2</sup>	Sal	-	-
	Teak	66.09	10.76
	Miscellaneous	55.58	4.06
	Others	-	-
	All	55.66	5.39

Taking the above figures into consideration the total growing stock existing in the three catchments works out to the tune of some 66 million M<sup>3</sup> which is more than the one-third of the total growing stock of Bastar, i.e., 187 million M<sup>3</sup>.

The forest based industries which can be set up based upon the existing rich resources, are Pulp Mill, Particle Boards mill, Vegetable Tannin extract plants (250000 tonnes annual capacity), a Co-ordinated

Saw Mills (using 170000 M<sup>3</sup> of saw logs) etc. The world Bank Identification Mission has also recommended the establishment of a Pulp Mill of 250000 tonnes annual capacity and a Co-ordinated Saw Mill with a capacity utilisation of 170000 M<sup>3</sup> of saw logs.

#### Current Forest Produce

At present the important forest produce in the district are timber, fuelwood, bamboo, tendu patta, sal seeds and myrobolans. The details of the current production are as follows :-

Forest Produce	Average annual production
1	2
1. <u>Timber</u>	
(a) Logs	225000 No.
(b) Poles	145000 M <sup>3</sup>
2. <u>Fuelwood</u>	50000 Tonnes
<u>Bamboo</u>	
3. (a) Commercial	55000 Tonnes
(b) Industrial	30000 Tonnes
4. <u>Tendu Patta</u>	325000 Standard bags
5. <u>Sal seed</u>	16000 Tonnes
6. Myrobolans	50000 Tonnes

Other important minor forest produce in the district are Harra, Gum, Tamarind, Phool bulan, Honey, Shikakai etc.

#### Value of the Forest Produce

The total annual value for the forest produce as calculated for the production during the year 1982-83 was estimated at about Rs. 437.00 million. The break-up of the value according to various major and minor forest produce is as follows :

Forest Produce	Value (million Rs.) 1982-83
1	2
1. Timber	320.30
2. Bamboo	26.85
3. Tendu Patta	52.25
4. Sal seed	18.78
5. Other minor forest produce	3.42
6. Income from the forest produce which are not nationalised	15.21
Total :	<u>436.81</u>

The value shown above is based on the forest out-turn during the year while the potential of Bastar forests is much larger provided its working is improved. It is estimated that with the provision of proper transport linkages alone the income from forests would increase to about Rs. 100.00 crores per year. There is a likelihood of further enhancement due to better and scientific working of the forests

#### **Livestock Resources**

Livestock plays a vital role in the social and economic life of human community, especially in rural area. It becomes more important in the tribal dominated Bastar region which is at the threshold of agricultural and industrial development. The role of cattle is very much significant in terms of dependable source of power, both for agricultural operations and transportation of produce to the markets. Similarly the sheep, goat and poultry are also associated very closely with the tribal's life.

#### **Population of livestock**

Total livestock population (1981-82) in the district was 2.025 million. Number of total cattle was 1.335 million, buffaloes 0.148 million, sheep 0.017 million, goats 0.417 million, pigs 0.106 million and other livestock 0.002 million. There were four heads of cattle

for every five persons. The growth of cattle and buffaloes during decade 1972 to 1982 has been 5.8 per cent. The average annual growth comes to about 0.6 per cent. Individually, cattle and buffaloes increased at an annual average of 0.5 and 0.1 per cent, respectively.

There has been a significant growth of milch cattle over a decade ending in 1982 the growth being 5.4 per cent of cows and 7.2 per cent of buffaloes. Youngstock constitutes about 30.0 per cent of the total cattle and about 16.0 per cent of the total buffaloes. Distribution of cows and buffaloes has been concentrated in the central region of the district comprising Kondagaon, Jagdalpur and Narayanpur tehsils. These share about 43 per cent of total cows and 67 per cent of total buffaloes in milk, of the district.

Presently, the cattle of the area is non-descript breed except in southern region where Ongole breed of cattle is being reared by the people. However, the cattle is mostly reared for draught and not for the supply of milk.

Goats are reared for the purpose of their sale and meat production, whereas pigs are exclusively meant for meat supply. However, their per capita availability is so poor that they can hardly suffice for providing nutritional levels to the people, in general.

Poultry is very popular among tribals of the district. Although they do not consume eggs but they keep poultry for their use at religious and ceremonial occasions. They sell their birds when they need money. Total number of birds in the district was 0.91 million in 1981-82.

#### **Livestock Products**

There are no significant quantity of livestock products, being produced in the district except traditional products like milk, hide, bone, meat and eggs.

In absence of any reliable estimate for determining the size of the production of hides and bones, it has been rendered difficult

to produce proper assessment of the by products from the livestock resource of the district. It is however, plainly conceivable that with a cattle and buffalo population of the size the district possesses, the quantum of byproducts such as bones and hides must be sizeable. Due to lack of communication facilities and organised collection system quite a substantial part of these must be going waste in the deep forest where predatory animals are active or otherwise too in case of natural mortality.

These limitations notwithstanding an attempt has been made to assess the availability of bones and hides. Data on birth and death rates are also not available and hence the estimates depend upon reverse calculations. The number of breedable cows and buffaloes roughly form about one-third of the total livestock. Assuming on an average, about sixty per cent of the breedable stock in a state of being pregnant and further assuming the incidence of abortion and other factors for reducing mature births calving is presumed from about fifty per cent of the breedable cattle and buffaloes. The combined average annual growth rate being 5.8 per cent it gives a mortality rate of about 10 per cent for the whole livestock population. Based on such a rough estimation the number of hides in a given year would be in the vicinity of about 1.5 lakh.

The mineral contents of the animal body are estimated to vary from 2 to 4 per cent of the body weight. Assuming therefore a maximum of 4 to 5 per cent of the animal body weight to be constituted of bones it is estimated that total availability of bones would range between 1485 to 1856 tonnes per year. The estimates of horns and hoofs are 297 tonne and 445 tonne per year, respectively.

Emphasis on the cattle development for milk produce has not been given much in the district. The rate of milk yield is very poor due to lack of proper maintenance, deficit in availability of fodder and improved breeds. On an average the daily yield of milk per animal for cow is 0.646 litre and for buffalo it is 1.6 litre. This yield is further reduced to 0.399 and 1.07 litres for cow and buffalo,

respectively if total population of milch cattle is taken into consideration. Accordingly, milk production comes to about 128526 litres per day for the district as a whole which makes per capita milk availability of about 70 gms. per day as against the average daily requirement of 200 gms. Production of other livestock products is not much significant.

#### **Fodder supply**

Development of livestock depends largely upon the quality and quantity of feed made available to them. Free and overgrazing of the land by animals have resulted in the deterioration of land and thereby decrease in the fodder production, both qualitative and quantitative particularly in the northern parts of the district. As has been stated earlier, the present annual requirement of dry fodder for livestock, in the district, is 3.25 million metric tonnes whereas the estimated production of dry forage and fodder is 2.15 million metric tonnes per annum. Production of forage in reserved forests and from fodder trees has not been included in these estimates. Thus, there exists an annual deficit of 1.10 million metric tonnes of dry fodder in the district.

#### **Livestock development programmes**

For the development of livestock in Bastar district emphasis should be laid down on the breed improvement programme of cattle and goat population, development of piggery and poultry and animal health cover. By the end of Sixth Five Year Plan facilities to cover 82000 cattle for breed improvement has been created. Looking to the need of breed improvement the cattle resource has to be improved with a sense of urgency during the Seventh Plan. The remaining breedable cattle should be covered for breed improvement. It would need to create facilities for covering about 2.5 lakh cattle population. Simultaneously, efforts should also be made for the fodder production programme and range management. Infrastructure should be developed for procurement and marketing of livestock products. The livestock development programme can provide an alternate source of income to the tribals, if organised and developed in a better way.



## I. Mineral Resources

Bastar district is very rich in mineral resources, especially, iron ore. Other important minerals are Bauxite, Limestone, Dolomite, Tin ore, Copper ore, Quartz, Garnet, Corundum, etc. Bastar district accounts for 9.37 per cent of the total royalty of the State from mining and minerals. Its place is third in the State. Bastar district is producing 15.68 and 63.16 per cent of iron ore of the country's and State's total production, respectively.

Following is the description of the different types of minerals found in the district in various geological formations.

### Dharwar formations

Dharwar rocks are sedimentary and metamorphic ones. These occur in three tracts in the district, namely (i) the Raoghat hills in Abujhmar region; (ii) the Bailadilla hills in Dantewara tehsil, and (iii) Chain of hills running from the midst of Pratappur and Koelibeda in Narayanpur tehsil northwards to Bhanupratappur tehsil. Dharwar formations have very good quality of iron ore. The metallic content of these ores varies between 60 and 64 per cent.

### Iron ore

The Bailadilla range of hills runs north-south along the western boundary of Dantewara tehsil and is about 35 kms. long and 9.5 km. wide. It rises sharply, at least 300 m, above the surrounding plateau. Its elevation above sea level is over 900 m. A longitudinal valley divides it into two ridges. Estimated iron ore in Bailadilla ranges is about 3,000 million tonne. Iron ore is exported to Japan from here and a large part of it has been kept reserve for Vishakhapatnam, Steel Plant. In this region a big reserve of 'blue dust' has also been formed of about 68 million tonne.

The second biggest reserve of iron ore is deposited in Raoghat hills situated on the northwestern border of the Northeastern

Plateau of Bastar. They lie on the northern part of the Narayanpur-Kondagaon border. Estimated reserves of iron ore in these hills is about 1,064 million tonne. Out of this deposit 400 million tonne of ore has been kept reserved for Bhilai Iron and Steel Plant.

Apart from these two big iron ore reserves there are many other small reserves located in the district. Important one is in Punnam hill near Avapali where 8 million tonne of iron ore reserves of good quality have been estimated.

## 2. Vindhyan formations

The Vindhyan occur in small patches on the west and east of Keshkal along the tehsil boundary between Kanker and Kondagaon. These are youngest of the Bastar rocks. Bauxite occurs in these rocks.

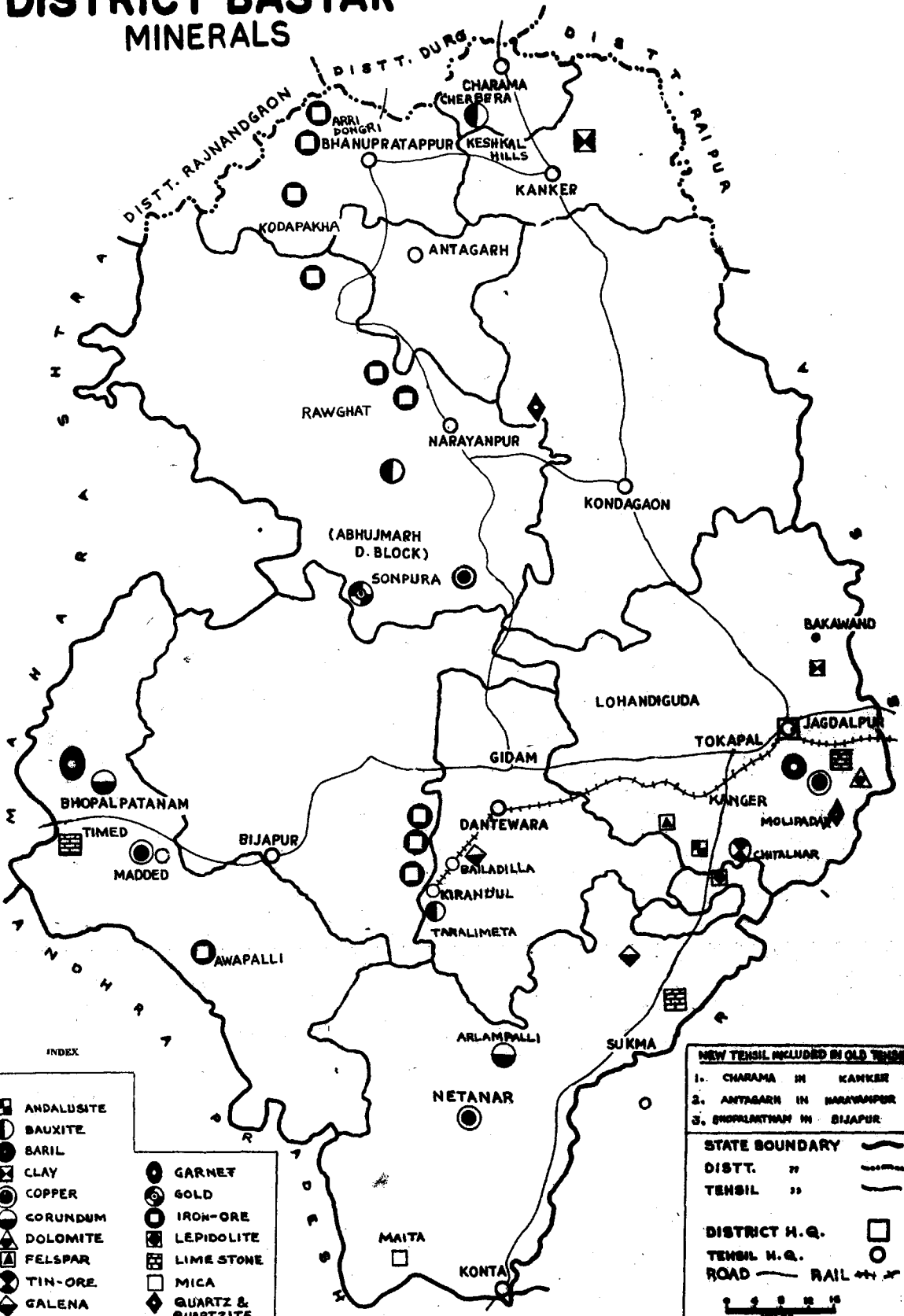
### Bauxite

Bauxite is considered as a rock. Commercial bauxite is composed of the minerals (i) gibbsite (Aluminium hydroxide) and (ii) diaspore plus silica, iron oxide, clay and other impurities. In Bastar district high quality bauxite is found in Bandhanwara, Kua, Kudarwahi, Cherbera, Budhiarmari, Patdongri, etc. regions of Keshkal valley. About 9.0 million tonne reserves of Bauxite are present in this region. This type of Bauxite can be used in Refractory, Chemical, Abrasive and Cement industries. The occurrence of about 0.83 million tonne of mixed type Bauxite in Taralimeta region of Bastar district has also been confirmed. This apart Bauxite is also found at few places in the laterites of Abujhmar hill ranges.

## 3. Cuddapah Formations

Four areas are covered by the Cuddapah formations in Bastar district. The largest one extends from Mardapal in Kondagaon tehsil to Tirathgarh in Jagdalpur tehsil and from Chitrakote to Jagdalpur. Remaining areas are from Bhopalpatnam in the northwest to Kotapalli in the southeast and in Abujhmar hills between Paralkote and Sonapur in

# MADHYA PRADESH DISTRICT BASTAR MINERALS



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| □ CLAY       | ● LEPIDOLITE         |
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**NEW TEHSIL INCLUDED IN OLD TEHSIL**

1. CHARAMA IN KANKER
2. ANTAGARH IN NARAYANPUR
3. BHOPALPATNAM IN BIJAPUR

**STATE BOUNDARY**

DIST. " ————  
 TEHSIL " ————

**DISTRICT H.Q.**

TEHSIL H.Q. ○  
 ROAD ———— RAIL ————



the Narayanpur tehsil. Limestone, Dolomite, Corundum, Tin ore, Lepidolite and Garnet occur in these Cuddapah formations.

### **Limestone**

There are large reserves of limestone present in Bastar district and most of these are of suitable quality for the manufacture of Cement. Kanger valley near Jagdalpur has the largest reserve of 850 million tonne. Potnar-Baranji area of this valley is also having a limestone reserve of 22 million tonnes which can be used for manufacture of cement. Limestone reserve also occurs near Bhopalpatnam in Bijapur tehsil and Kondagaon tehsil.

### **Dolomite**

Dolomite is also one of the most important mineral occurring in Bastar district. Flux, blastfurnace, S.M.S. and refractory class of dolomite reserves are found in Machkot, Tiriya, Kumli, Sadartera, Aaurabhata, Kropal, Tipodoro, Siritwada, Sarni-Jodi, Jiram, Pattajodi, Pulsa etc. regions near Jagdalpur. In Kumli-Tiria region 45-115 million tonnes of flux type of dolomite has been proved, whereas Pulsa region 3.30 million tonnes of flux and refractory class of dolomite reserves have been demarcated. These can be used in Iron and Steel Industries.

### **Corundum**

Corundum is found in the adjoining regions of Bhopalpatnam and Kuchnur villages. Corundum, which is the second hardest mineral known, is alumina containing 52.9% aluminium and 47.1 % oxygen. Corundum found in Bastar district is ruby-coloured. 25.0 tonnes of Corundum reserves have been proved in the district.

### **Tin Ore**

The first ever tin deposits of the country have been found in the Tongpal-Govindpal and Chitalnar regions of Bastar district. About 265.23 tonnes of primary and 957.50 tonnes of placer tin ore deposits have been discovered. Deposits of 420.20 tonnes of tin ore

have also<sup>been</sup> found in Bodawada, Kudripal, Murgel and Vedhanpal regions. Thus, in total about 2,790 tonnes of tin ore reserves have been demarcated which would give 1,981 tonnes of tin metal.

#### **Lepidolite**

Lepidolite is lithium mica, a complex silicate of aluminium, potassium and lithium with fluorine and water. This is found in Mundwal, Chitalnar and Kachhiras regions. It is presumed that about 3,456 tonnes of Lepidolite would be present in this region. Lepidolite can be used in ceramic and refractory industries also apart from extruding lithium metal.

#### **Garnet**

Garnet occurs near Kuchnur village in Bhopalpatnam region of the district. Estimates of garnet production have not yet been made.

#### **4. Archaean Granites and Gneisses**

Granites and Gneisses are widespread over about three-fourth of Bastar district. All other formations lie as patches over them. The granites of Bastar are intrusive, acid igneous rocks and are composed of the minerals, quartz and felspar, with some ferromagnesian minerals like biotite (black mica) and hornblende. On metamorphosis they become gneiss.

#### **Quartz and Quartzite**

Quartzitic sandstones are contained in both the Cuddapah and Vindhyan formations of Bastar and, thus, are found in Jagdalpur, Kondagaon, Kanker, Narayanpur and Bijapur tehsils. About 4.5 million tonnes of quartz is deposited in Gojhia dongari, Dangur dongri and Pultongi dongri regions which can be utilised in manufacture of glass.

#### **Copper ore**

Indications of chalcopyrite (copper ore) mineralisation have been found in the regions of Mundatikara, Kesarpal, Pakanar, Modenar and Madded villages. Detailed survey of these reserves is under progress.

## 5. Other minerals

Apart from the above described minerals occurrence of some other minerals has also been found like Felspar, Magnesite, Gold, Graphite, Garnet, Galena, Mica, Sillimanite, etc. In Sukma, Kanjipani and Netnar areas of the district Marble deposits of 1.7, 3.0 and 5.0 million tonnes respectively have been indicated.

### Infrastructure

During the course of various Five Year Plans infrastructure, within the meaning of creation of organisational and material structures for ensuring timely and, as far as possible, adequate availability of primarily necessary inputs, has been created in different sectors of the economy with a view to raising the levels of production, awareness, nutritional and health standards, skills etc. of the people of the district. The creation of such infrastructure is a necessary concomitant of a planned economic and social development since they aid in optimising resource utilisation and help transform the quality of the people of the area who themselves are an important resource for bringing social change. The infrastructural level achieved so far is given below according to the sectors in which it has been created.

### Agriculture

The district economy is mainly dependent upon agriculture. About seventy five per cent of the possible cultivable area is already under the plough and one fourth is available for further extension. Kharif is the main sowing season and paddy the principal crop followed by minor millets. Rabi crops are in their infancy as they cover a very small area. Basic inputs for agriculture development are fertilizers, irrigation, high yielding varieties of seeds and credit. The levels of 1981-82 are summarized below :

The consumption of fertilizers in 1981-82, from a position of non consumption, has improved. The consumption of NPK reached upto 484 tonnes of nitrogen, 215 tonnes of phosphate and 75 tonnes of potash.

The level of fertilizer consumption is no doubt poor since it is hardly 0.93 kg. per hectare as against the State average of 10.9 kg. per hectare yet persistent efforts in a tribal area have yielded results and a modest beginning has been made towards better performance.

Irrigation facilities from microminor sources have been created. Irrigation wells numbering 7778, tube wells 8 and 9 government lift irrigation schemes are in existence for exclusive use for irrigation. Lift irrigation from private sources has also been created and there are 330 electric pumps and 1201 diesel pumps in operation in different parts of the district.

The use of High Yielding Varieties of seed is a major break through in the direction of improving yields per unit of area. The coverage under high yielding varieties of seeds is mainly under paddy and wheat. Coverage in case of paddy is about 30800 hectares i.e. about six per cent of the total sown area under paddy crop. Wheat is being introduced in the area and therefore has advantage over other crops for having larger proportion of area under HYV. About 2000 hectares out of the total wheat area of 3000 hectares was already under HYV.

Credit facilities for the purchase of fertilizers, seeds, construction of tube wells, purchase of pumps, electricity connections and bunding of fields have been provided. Storage capacities for the produce have also been created. Apart from the capacity created by FCI and SWC the cooperative sector has created a capacity for storage of about 10000 mt. produce. Combinedly, the storage capacity is about 34600 mt.

Infrastructure for raising the quality seeds is another area of both research and action. The district possesses 4 agricultural farms for producing quality seeds which are run by the department of Agriculture. In addition 2 seed production farms are functioning under the management of Seed Corporation.

Agriculture University has established a Research Centre for developing appropriate technology and management practices suitable for tribal backward areas.

### Animal Husbandry

The cattle wealth of the district is as follows :

Cattle	Buffaloes	Sheep	Goat	Pigs	Poultry
1	2	3	4	5	6
1335.8	148.7	17.1	416.8	106.5	887.9

The cattle is of nondescript category having poor capacity for work as well as for milk supply. However, Dairy Corporation of the State has popularised milk production in the northern and central parts of the district.

With a view to take care of the health of animals and save them from diseases infrastructure for medical care has been created. There are 36 veterinary hospitals, 58 veterinary dispensaries and 13 veterinary health centres. For checking contagious diseases one mobile unit and seven ambulatory units are functioning. As a measure to eradicate Rinderpest two quarantine stations and one followup unit has been established.

Cattle development programme has been taken up and one unit under controlled cattle breeding programme, two artificial insemination centres, one key village block and 42 cattle breeding extension units have been established. Facilities for insemination with exotic semen have also been created. Breeding facilities with Ongole breeding bulls have been created at Bijapur. Improved breeding coverage has been created for 82000 cows.

A farm for improving the egg laying capacity of local birds at Kondagaon and one farm for producing cross breed birds at Jagdalpur has been established. A pig breeding farm at Bastar and 39 centres at



various places for goat development have been established.

Training facilities for tribal people has been created at Jagdalpur. At present one veterinary institution is for every 18000 heads of livestock.

### **Fisheries**

Out of the total productive water area(11725 ha.) in the district about 4437 ha. would have been developed by the end of Sixth Plan. For developing fisheries in the district there would be a demand of about 240 lakh fish fry while the capacity so far created is for 90 lakh fry. Five fish farms at Kanker, Charama, Jagdalpur, Balinga and Pakhanjore have been created. An area of 557 hectares have been brought under intensive Reservoir Development Programme. Two circular Pool type (chinese) hatcheries have been established.

Training and extension facilities for tribals have been created. Tribals and tribal couples are trained in improved techniques of fish culture, exploitation of fish, net making and its mending. They are given free equipment initially and are helped in getting established.

### **Forest**

The Plantation Division of the Forest department took up large scale plantation in the district. An area of 1000 hectares has been planted with eucalyptus. Development corporation took up experimental plantation and an area of 1600 hectares has been planted with tropical Pine. By the end of Sixth Plan plantation of various species would be completed over an area of 10225 hectares. In addition 62000 fruit trees would also be planted.

Training programme for tribal youth has been taken up with a view to developing local competence in forest management. About 150 tribal youth are likely to be trained by the end of Sixth Plan.

## **Irrigation**

The district has vast water resources. Water resource availability has been estimated, to be 22912 cubic million meters from all sources, the largest being surface water flow. Irrigation potential has been created to cover 25288 hectares. By the end of 1984-85 the potential is likely to be of the order of 78400 hectares through Government and Dandakaranya Authority sources. Irrigation potential created by private sources would be additional. The likely potential by the end of Sixth Five Year Plan is estimated to be about 84000 hectares. About 3.5 per cent of the total water wealth of the district would thus be utilised leaving a huge balance for future development. The present annual draught is not included in the above estimates which is about 6143 cubic thousand meters mainly out of ground water resources.

The utilisation of the created potential is certainly poor, the irrigated area of crops being about only two per cent of the net sown area. However, further extension in the created potential would be needed to correct the areal imbalance with regard to the availability of irrigation facilities.

By the end of Sixth Five Year Plan there would be 20 lift, 6 medium and 302 minor irrigation projects completed and ready for utilisation from government sources. Dandakaranya Authority would be completing 11 minor projects. The combined potential including the existing potential would be capable to cover slightly more than 10 per cent of the sown area by the end of 1984-85.

## **Power**

The potential for generating hydroelectric power in the district is considerable. The Indrawati alone has a potential of generating 3650 Mw of hydel power, and plan for its commission into

generating power is at the anvil. The construction of one of the projects at Bodhaghat with a capacity of generating 500 Mw. power has already begun and agreement with the world Bank has been signed for financial assistance. However, at present there is no electricity generating unit in the district.

The district is served by a number of transmission lines. Bhilai-Barsur line of 220 Kv., Barsur-Kirandul line of 132 Kv., Barsur-Jagdulpur line of 132 KV., serve the district. Second circuiting of all these lines has been completed. In addition an interstate 220 Kv., lines between Barsur and lower Sileru in Andhra Pradesh has been laid mainly for meeting the peaking demand. The second circuiting of this line is also proposed to be completed soon.

At present, all tehsil and 30 development block headquarters have been electrified. Under rural electrification programme 637 villages have been electrified upto March 1983 which is about 18.8 per cent of the total inhabited villages of the district. By the end of Sixth Five Year Plan 850 villages out of the total of 3388 inhabited villages are likely to be electrified, thus bringing the rural electrification level to about 25.0 per cent of the total inhabited villages.

### **Cooperation**

Long medium and short term credit needs of the members of cooperative societies and other people are met by Central Cooperative Banks and Land Development Bank which have 23 and 7 branches operating in the district. Besides this credit infrastructure there are 50 branches of Rural Banks and 43 branches of other Banks. Rural areas are mainly served by 96 largesized Agricultural Multipurpose Cooperative Societies which also have 7 branches. These societies are located at development block and hat levels. Marketing activities are carried out by the Apex Marketing Federation and Marketing Societies.

### **Marketing**

There are 22 Industrial cooperative societies, 17 weavers societies, 9 Fisheries cooperative societies. 3 Milk supply cooperative

societies, 11 Housing societies and 5 labour societies. In all there are 208 Cooperative societies with a combined membership of 131617.

The storage capacity in the cooperative sector has been created. Marketing cooperative societies possess 17 godown with a storage capacity of 6200 mt. The LAMPS have a storage capacity of 1250 mt.

### **Roads**

Pucca road mileage available in the district is 1973 kilometers which gives 5.05 km. of road length per 100 sq.km. of area. All tehsil headquarters, 28 development block headquarters and 25 police stations are connected by pucca roads. Out of the total of 3388 inhabited villages 481 villages and 108 Hat centres out of 290 are connected by roads. The length of unsurfaced morrum and kaccha roads is 1475 km. In addition 2315 km. road length is under forest roads.

By the end of Sixth Plan road length under pucea roads is likely to go up to 2269 km. The distribution of road infrastructure among various sub regions of the district is poor.

### **Water Supply**

The district has 3388 inhabited villages and 7033 hamlets out of which 3268 villages and 6770 hamlets were problem villages and hamlets. The basic facility of providing safe and adequate drinking water would have been created for 3141 villages and 5696 hamlets by the end of Sixth Plan. All towns in the district have been provided with safe drinking water through piped water supply.

### **Medical and Health**

Medical institutions made available in the district are one District hospital, two civil hospitals, 34 Primary Health Centres, 32 Additional Primary Health Centres, 48 Mini Primary Health Centres, 6 Civil Dispensaries and 48 Ayurvedic Dispensaries. The total number of beds available in these institutions are 436. There are 497 sub health

centres. In addition to these one 50 bedded hospital at Kondagaon, 3 Primary Health Centres and two dispensaries are being run by Dandakaranya Authority. Similarly one hospital and one Mini Primary Health Centre are being operated by NMDC at Bailadilla Iron Ore Project.

At present one medical institution is available for about 15000 persons and one bed for nearly 4300 persons. According to area one medical institution serves for about 320 sq.km.

### Education

The literacy level of the district in 1981 was 14.13 per cent of the total population. The males had 20.99 per cent of the total male population as literate while in case of females it was 7.29 per cent of total female population.

Educational infrastructure consists of 3347 Primary Schools, 542 Middle Schools, 62 Higher Secondary Schools and 51 Ashram Schools. The level of enrolment in 1981 in case of boys belonging to age group 6-10 was 83.02 per cent, 11-13 age group 17.42 per cent and 14-16 age group 13.48 per cent. In case of females, levels for the same age groups were 39.39 per cent, 6.46 per cent and 4.41 per cent respectively.

Infrastructure for post HSS education has also been created in the form of eight colleges, of them 2 are in north Bastar and 3 each in central and south Bastar. This includes one college for girls located at Jagdalpur.

One Engineering College with courses in Civil Engineering has been established. Three Training cum production centres are in existence at Dantewara, Narayanpur and Kanker. In addition two ITI at Bastar and Bade Bacheli are functioning.

Besides these infrastructural facilities for education, 2 Rural Functional Literacy Projects and two Nagrik Shiksha Projects have been provided for Adult Education Programme.

## Markets

Market institutions both of regulated and unregulated categories have been established for ensuring better and equitable operation of exchange activities. There are 8 Regulated Agricultural Produce Markets with 22 sub markets which handled 45547 M.T. of agricultural produce during 1982-83. However average area per market and sub market centres comes to 1302 sq. km. which requires to be reduced in subsequent years.

Tribal economy of the district has autonomously created an institution known as Hat which performs basic functions of the market and serve the people of a given area. Such 'hat' markets number 292 in the district and average number of villages covered by each hat centre comes to about 12 villages. Since most of these hat markets have evolved out of the functioning of tribal economy and social conditions their distribution is uneven in various areas of the district. The number of development blocks according to average number of villages served by hat centres are as follows :

Number of Development Blocks	Number of villages served per hat markets
1	2
12	4 to 9
8	10 to 15
6	16 to 21
3	22 to 27
1	28 to 33
2	more than 33

Keeping in view greater intervillage distances obtained in the district these hat markets are insufficient to serve the area effectively.

## THE PEOPLE

The concept of planned development is people oriented in approach since it is conceived, implemented and achieved by the people for the people. In evolving a developmental frame for any area the human resource available there should necessarily form part of the total resource inventory as development to a large extent depends upon, apart from material resources, the quality of the people inhabiting the area. The approach has to be to improve the productive capacity of the people in the context of a wider market as well as for self consumption. The people are the cause of development and also the recipient of the gains therefrom. If the people of the area are not benefited their standard and quality of life remain unaffected, they are made to toil without commensurate returns or are left just passive onlookers, then the process of development is not tempered with social justice. It is for this reason that development strategy should go beyond the abstraction of the term people and should identify the people who are to be developed in their sociocultural context and historical compulsions. Development comes through the application of the people, their skills, entrepreneurship and above all their collective will. These attributes in aggregate make the subject a social resource for development.

The people of Bastar are a variegated lot. Of the total population about 67.8 per cent are tribal comprising various subgroups of different communities, both large and small, having cultural and social variations. Another about 5.5 per cent belong to scheduled castes. The total population of the district as per 1981 Census was 1842854 out of which 920321 were males and 922533 were females. There has been a continuous increase in the number of people in the district over the last 80 years. The growth expressed in percentage decadal variations is given below :

1901-11	1911-21	1921-31	1931-41	1941-51	1951-61	1961-71	1971-81
1	2	3	4	5	6	7	8
+36.65	+5.15	+12.13	+18.54	+16.64	+27.77	+29.85	+21.56

The percentage increase in every decade except the last was more than the State and in some decades substantially large such as 1901-11, 1911-21 and 1941-51. Such large increases do not appear to be on account of natural growth and immigration seems to have played a significant role. The Thekedar system of administration and immigration of Gonds should be responsible for population increases in the past. Griegson has mentioned in his 'Maria Gonds of Bastar' that people who had migrated earlier to the district were inviting their relatives and people from outside the district were coming in large numbers. This phenomenon gradually reduced the proportion of tribals in the total population. The increases in the decades 1951-61 and 1961-71 again appear to be on account of migration in which, apart from government functionaries, Dandakaranya Rehabilitation and Bailadilla Iron Ore Project must have played an important part. The decrease in the rate of increase during 1971-81 appear due to restrictions on the purchase of land of the tribal which resulted in halting the influx from outside and associated with it, to a lesser degree, might be the impact of family welfare programme.

The general rate of growth of population in the district during the decade 1961-71 was 29.85 per cent which declined to 21.56 per cent in next decade of 1971-81. During these two decades the tribal population registered a growth of 22.5 per cent and 20.8 per cent respectively. The rural growth of population during 1961-71 was 27.9 per cent which came down to 18.6 per cent during 1971-81. The corresponding figures for the growth of tribal population in rural areas was 22.2 per cent and 19.8 per cent respectively. Variation in population during the last two decades is shown below :



Year	Category	Population variation		
		Total	Rural	Urban
1	2	3	4	5
1961	General	1167501	1140602	26899
	Tribal	843749	841214	2535
1971	General	1515956 (29.85)	1459321 (27.94)	56635 (110.5)
	Tribal	1033950 (22.54)	1028374 (22.2)	5576 (119.96)
1981	General	1842854 (21.56)	1731148 (18.6)	111706 (97.2)
	Tribal	1249197 (20.8)	1232038 (19.8)	17159 (207.7)

(Figures in brackets are percentages. Population for 1981 given above are final figures).

It will be observed that tribal population in both rural and urban areas has grown with a higher rate in 1971-81 while there was a decline in general growth of population. In spite of this phenomenon the proportion of tribals in total population went down in both these decades. The proportion of tribals in the total population of the district was 72.3 per cent in 1961 which declined to 68.2 per cent in 1971 and further reduced to 67.8 per cent in 1981. The decline in the proportion of tribals during 1961-71 appears to be a contribution of migratory factors in addition to natural growth while in 1971-81 migration appears to have considerably reduced. This phenomenon may be helpful in raising the share of tribals in the gains of development.

The distribution of population in various areas of the district reveals higher concentration of population in Jagdalpur tehsil followed by Kondagaon and Kanker tehsils. These three tehsils have the advantage of being conveniently connected with Chhattisgarh region in the north. Tehsilwise distribution of population and their percentage share is shown below :



ADIVASI BELLE

Tehsil	Population	Percentage
1	2	3
1. Jagdalpur	508438	27.6
2. Kondagaon	312933	17.8
3. Kanker	219164	11.9
4. Narayanpur	196682	10.7
5. Dantewara	194676	10.6
6. Konta	161445	8.8
7. Bijapur	153472	8.3
8. Bhanupratappur	93719	5.1

The population is mainly rural in character. As high as 94.0 per cent of the total population comprising 1731148 persons is in rural areas and only a small proportion of 6.0 per cent i.e. 111706 persons constitute urban areas of the district.

The growth of population during the 1971-81 decade is characteristic in the sense that it was of a higher order in low density areas of the district. The tehsilwise position is as follows :

Tehsil	Percent growth of population	Tehsil	Percent growth of population
1	2	1	2
1. Bijapur	30.5	5. Narayanpur	21.0
2. Kondagaon	26.1	6. Jagdalpur	20.4
3. Bhanupratappur	25.5	7. Kanker	17.8
4. Konta	22.2	8. Dantewara	13.1

The first four tehsils have experienced population growth bigger than the district. Kanker and Dantewara have registered lower growth than the district. Even Jagdalpur tehsil which is by far the most developed tehsil of the district and also the headquarter of most of the government agencies/departments has shown marginally lesser growth than the district average. The tendency of higher population growth in areas where population density was less is indicative of other causal factors than the natural growth.

The growth of population according to tehsils was highest in Bijapur during the decade 1971-81 but it remains the least densely populated area. The density of population of constituent states in 1931 was 19 persons per sq.km. of area for Bastar state and 27 persons per sq.km. for Kanker state. The increase in density for the same area increased to 22 and 31 per sq.km. respectively in 1951 and 45 and 59 per sq.km. respectively in 1981. The over all density for the district in 1981 was 47 persons per sq.km. of area. The density variation for different areas are given below :

Tehsils	Density per sq. km.		Percentage variation
	1951	1981	
1	2	3	4
Kanker	39	74	89.7
Bhanupratappur	20	40	100.0
Jagdalpur	41	74	80.5
Narayanpur	14	37	164.3
Kondagaon	23	50	117.4
Dantewara	28	52	85.7
Bijapur	10	20	100.0
Konta	19	40	110.0
District	23	47	104.8

These characteristics show that population concentration has a tendency towards the centre of the district. It may also be seen that population

concentration during the last thirty years has also been more in relatively less developed and far away areas of Konda and Bijapur in the south, Bhanupratappur in the north and Narayanpur in the west which have low share of population of the district.

The population according to sex composition is reflected by a sex ratio of 1003 females per 1000 males. The females outnumber males in Konda and Dantewara tehsil in the south and Kanker and Bhanupratappur tehsils in the north. Jagdalpur, Kondagaon and Narayanpur tehsils in the central parts of the district are having less females where they range between 973 to 997 per thousand males. Bijapur tehsil in the south also has marginal male preponderance with a sex ratio of 993 females per thousand males.

Literacy level of the population is poor. According to 1981 Census 259993 persons constituting about 14.13 per cent of the population were literate. Literacy among males was about 20.99 per cent and that among females 7.29 per cent. Of the total literate males about 81.8 per cent were located in rural areas and similarly about 67.0 per cent of the literate females. While the coverage of population from the point of view of literacy is poor it is significant that composition of literate population is mainly rural particularly in case of literate males. It is also indicative of the fact that such social asset formation has begun in rural areas and with concentrated and sincere efforts educational and comprehension levels of the rural population can be improved without much social resistance. Educational facilities created in the district are being utilised by the people which is evident from the fact that at primary school level about 83.0 per cent of the boys and 39.0 per cent of the girls belonging to the age group 6 to 10 have been enrolled in the schools. Similarly for the age group 11-13 enrolment is 17.4 per cent for boys and 6.5 per cent for girls and age group 14-16 it is 13.5 per cent and 4.4 per cent for boys and girls respectively.

The census 1981 collected data regarding workers in two categories, viz. main workers and marginal workers. Main workers in the

district were 818109 constituting about 44.5 per cent of the total population. Work participation as a proportion of workers in total population was 60.6 for males, 28.4 for females. There was no major variation as to the participation rates for males and females in rural areas as they were almost equal in size i.e. participation rate for males was 61.3 and 29.4 for females. In urban areas total participation rate was 31.8 with a breakup of 49.9 and 11.9 for males and females respectively. The total participation rate was 45.3 in rural areas.

Marginal workers were 124106 constituting about 6.7 per cent of the total population. Females formed the major part of this category by being about 93.7 per cent of the total marginal workers. The concept of marginal workers is based on the duration of engagement in work for less than 183 days during the year. These workers may as well be taken to mean workers who for one reason or the other could not work for the stipulated period. If these workers are added to the size of main workers the proportion of workers in total population goes up to about 51.0 per hundred population.

The composition of workers is characterised by a overwhelming majority of cultivators who form about 72.0 per cent of the total main workers. Adding about 17.0 per cent of workers who were classified as agricultural labourers and who also depend mainly on agriculture the total work force engaged in agricultural activity swells up to 89.0 per cent of the main workers. The remaining workers constituting about 11.0 per cent were distributed among other occupations out of which about 2.0 per cent were engaged in household industry.

The work pattern as it emerges from the above categorisation of workers emphasises the primacy of land cultivation. The comparison of categorywise distribution of workers as obtained in 1981 with that of 1971 further indicates that the proportion of cultivators has increased.

Persons	Percentages							
	Cultivators		Agricultural labourers		Household Industry		Others	
	1971	1981	1971	1981	1971	1981	1971	1981
1	2	3	4	5	6	7	8	9
Persons	67.08	71.82	22.13	16.98	2.26	1.65	8.53	9.55
Males	71.37	74.13	17.06	12.46	2.25	1.76	9.32	11.65
Females	51.59	66.93	40.39	26.58	2.31	1.43	5.71	5.06

It would appear that proportion of workers engaged as cultivator has increased in 1981 as compared to 1971 and the proportion working as agricultural labourers has decreased. Similarly number of persons engaged in household industry has reduced while there has been an increase under the category of other workers. This change appears to be the direct consequence of allotting land for cultivation by government to agricultural labours and assisting small and marginal farmers. The increase in the category of other workers is probably on account of construction activities under various development programmes.

The analysis above does not provide a clear picture with regard to the tribal population which is its major constituent. The analysis of growth or decline of tribal population is not possible at present on account of the paucity of information regarding tribewise number of people over the past decades and attempts at segregating tribewise figures from the combined figures may not conform to ethnological criteria. For this reason tribewise socioeconomic changes can also not be studied. There is urgent need to attempt socioeconomic studies for various tribes. The census organisation of Madhya Pradesh has promised a detailed socioeconomic study of Abujhmar area of Bastar district which is yet to be published. However there are other studies dealing with a single tribal community but they are old and need to be supplemented by fresh data and analysis.

The final population figures for 1981 are 1842854 persons out of which 1249197 are tribals constituting about 67.8 per cent of the total. Their distribution among various tehsils is as under :

Tehsil	Total population	Soc. Tribe	Rural	Urban
1	2	3	4	5
Bhanupratappur	93707	66202 70.64	66202	-
Kanker	219356	126164 57.51	123678	2486
Narayanpur	197074	111687 56.17	111687	-
Kondagaon	313385	219756 70.12	215576	4180
Bijapur	153638	124040 80.73	124040	-
Dantewara	194895	140044 71.85	137242	2802
Konta	161789	138516 85.61	138516	-
Jagdapur	509010	322788 63.41	315097	7691
	1842854	1249197	1232038	17159

The tribal population is mostly rural since about 98.6 per cent of the tribals are in rural areas. Out of the total population of the district tribals constitute about 67.8 per cent and its distribution in rural urban breakup shows only one percentage point in urban and 66.8 in rural areas. This necessitates that any programme aimed at their development shall have to have a rural base and will have to be designed according to the need of rural areas.

It is also necessary to find out areas of tribal concentrations since in areas where they are overwhelming in number social and economic change can only be contemplated within the framework of functional society available there. In areas where the tribals are interacting with nontribals strategy of change may be different. Keeping this in view the areas of tribal concentrations have been attempted by means of density and tribal concentration has been worked out in terms of proportions. These are expressed in the following table :



Tehsil	General density per sq.km.	Tribal density per sq.km.	Non-tribal density per sq.km.	Tribal concentration in percentage
1	2	3	4	5
Kanker	74	43	31	58
Bhanupratappur	40	29	11	73
Jagdapur	74	47	27	64
Narayanpur	37	21	16	57
Kondagaon	50	35	15	70
Dantewara	52	37	15	71
Bijapur	20	16	4	80
Konta	40	34	6	85

The highly tribal concentrated areas are Konta, Bijapur and Dantewara in the southern parts, Kondagaon in the centre and Bhanupratappur in the north of the district. Konta, Bijapur, Kondagaon and Bhanupratappur are the areas where population growth is of a higher order than the district.

The census data have so far not provided figures of tribals according to their work patterns. However, looking to their heavy concentration in rural areas it can safely be presumed that their work pattern must not be different than the general work pattern as has emerged for the total population. They are, ergo, mostly cultivators. Supporting evidence comes from the distribution of land holdings among different classes of people. The table below gives the absolute and percentage distribution of land holdings in 1980-81 :

Holdings	Classes of people			Total
	Scheduled Tribe	Scheduled Caste	Others	
1	2	3	4	5
Number of land holdings	155339 (72.8)	12309 (5.8)	45634 (21.4)	213282 (100)
Area of land holdings	752465 (80.1)	29056 (3.1)	157475 (16.8)	938996 (100)

The tribals possess about 80.0 per cent of the area under landholdings.

The data and inferences arrived at above however, do not provide an insight into the organisation and way of working of the tribal society. A workable basis can nevertheless be found out if area distribution of tribal communities are identified according to geographical sub-regions of the district. It will also help in determining the size of the tribal community. The tribal population is not a single homogenous society but is constituted of a number of small and big groups and sub groups of tribes different in social structure. They are isolated on account of geographical barriers and cultural variations. They are mainly concerned with their clan or at best their community to which they belong. Their economic and political organisation conforms to community boundaries although traditional rigidity is on the wane. However in their social ethos they are still traditional.

The tribal population mainly belong to Muria and Maria tribes. Other prominent tribes are Gonds, Halwas, Bhatras, Parja or Dhurva, Dorla and Gadhava. These tribes are distributed all over the district and are individually concentrated in specific geographical pockets of the district. The Murias are concentrated in Kondagaon, Antagarh, parts of Narayanpur, Bhanupratappur and Jagdalpur tehsils. They are mostly found in the north of Indrawati river which bisects the district in almost two equal halves. Marias occupy areas of Dantewara, Bijapur, Kanta, western parts of Narayanpur and Jagdalpur tehsils. The northern tehsils of the district i.e. Kanker, Bhanupratappur are mostly inhabited by Gonds and Halwas although the latter are also found in Kondagaon tehsil. Bhatras are limited to the north eastern parts of Jagdalpur tehsil bordering Orissa. Parja or Dhurva tribe is restricted to South eastern parts of Jagdalpur tehsil and extends onto Sukma of Kanta tehsil. Dorlas are concentrated in a narrow strip on south western, southern and south eastern boundaries of the district and are mostly limited to Kanta tehsil. The distribution of these tribal communities according to geographical locations on space brings out two prominent features, viz. (i) Murias and Marias are far more numerous than other tribal communities and cover larger

area of the district and (ii) other tribes are small groups of tribal people retaining their identity in isolated pockets in different parts of the district.

Population figures according to different tribes of the district are difficult to obtain. It was in 1931 census that tribewise figures were presented but their reliability was not acceptable to Mr. Grigson who devoted considerable space in his book 'Maria Gonds of Bastar' on the possible adjustments on ethnological considerations. Nevertheless, figures produced by 1931 Census are the only available basis to conjecture about the strength of different tribal community groups. Mr. Grigson adjusted those figures for Bastar State as it was formed at that time and have little relevance to the area covered by Bastar district today. Subsequent censuses have also not provided population figures for different tribes. It is, therefore, difficult to give any dependable account of the growth or decline of population of different tribal communities. The census 1971 has again provided tribewise figures to a certain extent but it has also lumped together population of major tribal communities. The census of 1981 is also not likely to provide tribewise figures very different from 1971 census.

An attempt has however been made to estimate tribewise population figures by arranging tribal population according to the regions of their preponderance. The areas of some tribal communities are well delineated but they are not free from geographical overlapping and it was found difficult to determine the size of any area specific tribal community with absolute certainty, and the estimates only represent the likely size of individual communities, hopefully not wide off the mark. Areawise tribal population figures as per 1981 Census are as follows :

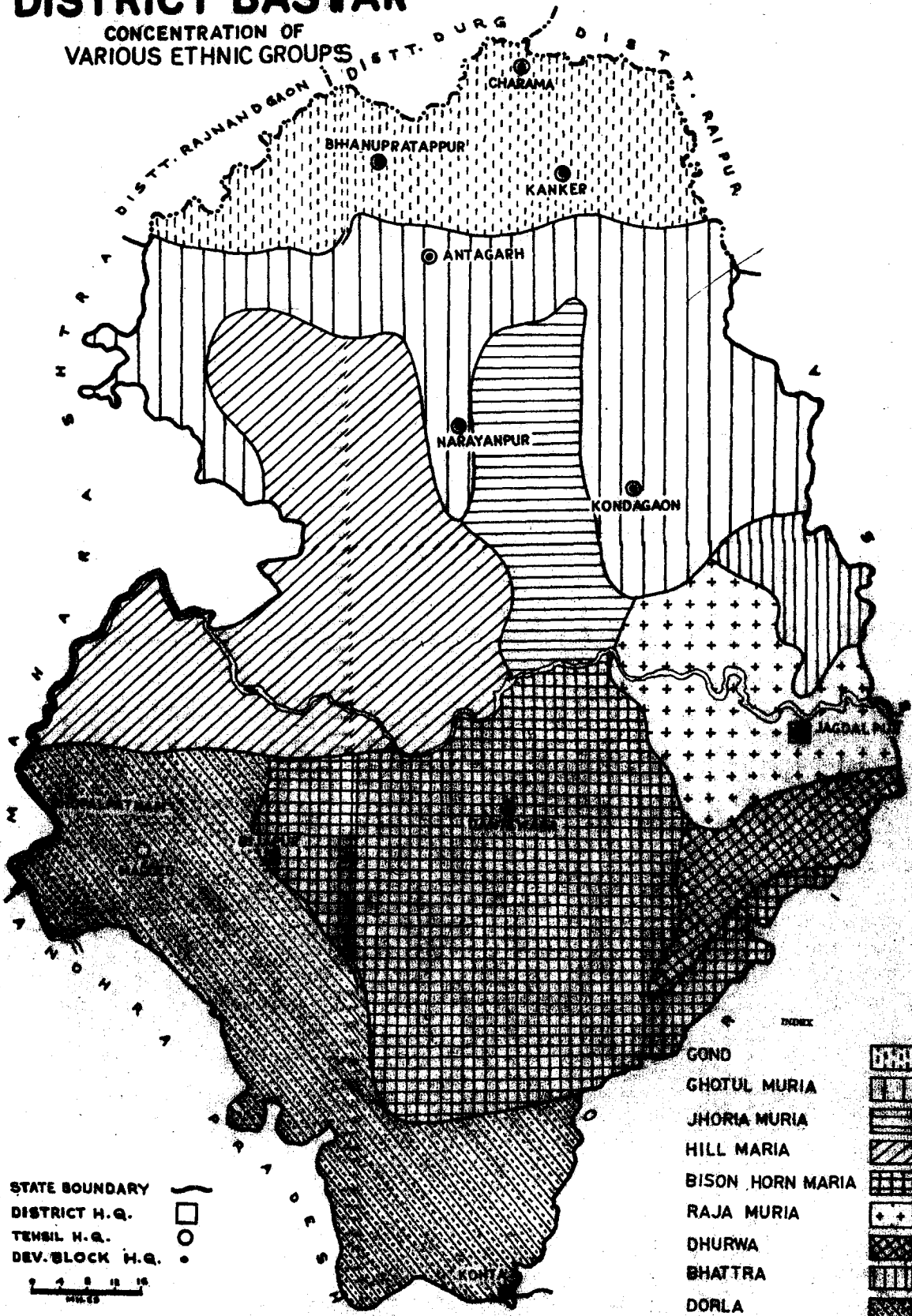
Area/Development Block	Population		Main constituent tribes
	Total	Tribal	
1	2	3	4
A. Charama			
Sarona			
Kanker	297978	189880	Gond, Halwa, Muria
Bhanupratappur			
Durg Kondal			
B. Keshkal, Makdi, Pharagaon, Kondagaon, Baderajpur Narayanpur, Antagarh, Koilibeda, Bastar, Bakawand, Orchha	679333	445719	Muria, Gond, Hill Muria, Halwa, Bhatra
C. Jagdalpur, Tokapal, Bastnar, Lohandiguda, Kuskonda, Geedam, Dantewara, Katikalyan, Bijapur, Bhairamgarh, Chhindgarh, Darbha, Sukma.	625145	487679	Maria, Muria, Parja or Dhurva, Dorla.
D. Bhopalpatnam, Usoor, Konta	128692	108770	Maria, Dorla

The above distribution of different communities represents the rural dispersal and does not include their respective strength in urban areas. The tribal population in urban areas is however very small with a distribution of 2486 persons in Kanker area and 14673 persons in Bastar area thus making a total of 17159 persons.

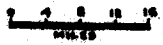
According to 1981 census the strength of the main tribes is likely to be as follows : (unpublished)

# MADHYA PRADESH DISTRICT BASTAR

CONCENTRATION OF  
VARIOUS ETHNIC GROUPS



STATE BOUNDARY  
DISTRICT H.Q. □  
TEHSIL H.Q. ○  
DEV. BLOCK H.Q. ●



- INDEX
- GOND
  - GHOTUL MURIA
  - JHORIA MURIA
  - HILL MURIA
  - BISON HORN MURIA
  - RAJA MURIA
  - DHURWA
  - BHATTRA
  - DORLA



Halwa	69755	Dorla )	
Bhatra	118741	Maria )	
Gadhawa	1526	Muria )	1046861
Parja	900	Gonds )	
Others	11414		
	<u>202336</u>		<u>1046861</u>

The biggest chunk of 1046861 has been shown under Gonds which include the main tribes off Gonds, Maria, Muria, Dorla and a host of other small tribal groups. It will also appear that Parja have been shown to be only 900 while in 1931 they were 17569. In 1971 they were reduced to 7256. This indicates that Parjas returned themselves as Gonds and about 43000 Parjias have been included under the generic name of Gond. Again there were about 37157 tribal persons returned as unspecified in 1971 census. In 1981 census other tribal people come to about 11414 which means that the major part of the growth of these people i.e. about 70000 persons of this category have also been included under Gonds. By applying the general rate of growth of population over 1931 census figures the following picture emerges for the main tribes :

1. Dorlas	33104
2. Maria	356410
3. Muria	304875
4. Gonds	<u>220383</u>
	<u>914772</u>

To this estimate if about 43000 Parjas and 70000 unspecified tribes are added the figure is raised to 1027772. Accordingly, the strength of four above mentioned tribal communities may be taken to be in the vicinity of the estimated figures. Or alternatively, the remainder may be proportionately distributed among the four communities accepting the judgement of the people who have returned themselves as Gonds. Such a step will inflate these figures to Marias 407925, Murias 348464, Gonds 252084 and Dorlas 38388. The revised strength also does not appear to be wide off the mark.

Analysis regarding the strength of different tribal communities brings to focus two characteristics of the tribal population, viz.

(i) that tribal community possesses considerable degree of heterogeneity and (ii) that they tend to live in homogenous groups covering a territory, distinct and defined. The bigger communities too are composed of small communal groups and it is the convenience of the observer which makes them a bigger area-composite groups. Within themselves they are different. Major tribal communities of Gonds, Murias and Marias have more than ten sub groups each and if these subgroups are considered to be target groups for development then these communities are also to be treated as 'small'. However, bigger communities have the advantage of intramingleing among subgroups as well as with other communities and display social poise, patience and understanding.

The problems of these communities vary according to their size. Smaller the community lesser is its capacity to offer resistance to exploitation. Subgroups of bigger communities also tend to develop herd tendencies of cohesiveness and quickly adept themselves to deprivation without demur accepting the inevitability of the circumstance. The problems of development therefore would be different for different communities and it is felt that development of the tribal in the context of his community would be more suited. Within the framework of general tribal development emphasis on different programmes for different smaller tribal communities should be placed so that economic forces unleashed in the area may not suddenly disrupt their social life and may provide them sufficient time and chance to adjust them-selves to social change in the offing. A brief acquaintance with the character, social modalities and work pattern of some of the major communities would therefore be in order. The tribes hereafter described are named as they are presently known.

### **Gonds**

Gonds are concentrated in the northern parts of Bastar in the area which was once the princely State of Knaker. The area is a plain country and more akin to the Chhatisgarh plains which are spread towards

its north. The Gonds inhabiting this area not only have much in common with the Gonds of Chhatisgarh living in Raipur, Durg and Rajnandgaon districts of the State but are commensal with them.

The Gonds constitute about 52 per cent of the total population of the area of their preponderance. They are subdivided into groups such as Raj Gonds, Dhur Gonds, Naik Gonds etc. They are settled cultivators. A distribution of main workers of this area shows 68.8 per cent of the total workers engaged in cultivation and 21.6 per cent as indirectly dependent on agriculture in the capacity of agricultural labourers. This shows that about 52 per cent of the total population is dependent upon cultivation. The main crop of the area is paddy.

The Gonds live in more organised villages and their houses are constructed with mud and roofed with baked tiles.

### **Bhatras**

Bhatras are confined to north eastern parts of Jagdalpur and to some extent in the south eastern parts of Kondagaon tehsils. They have over flowed in large numbers into Orissa. Their language is influenced by oriya dialect. They wear sacred thread. Grigson thought them to have come with the Raja of Bastar but in the course of time any trace of dravidian influence over their language has banished and they speak a language akin to Halbi with oriya accent. They have considerably changed over to Hinduism and depending upon the degree of change their community organisation has changed. They are subdivided into Bade Bhatra, Pita Bhatra, and San Bhatra. The last subdivision is more tribal in its ways.

Bhatras live in open country and are good farmers. They have given up the practice of shifting cultivation and have even taken up to growing wheat which has still not fully spread in the district. They fish expertly from fields, ponds and streams. They keep ducks for meat and eggs beside goats.

Bhatras are rich in folkore and folk theatre. After harvesting their crops they engage themselves in cultural activities including singing, dancing and performing Nat.



According to 1981 census Bhatras were 118741 coming fourth in terms of strength of the communities.

#### **Parja or Dhurva**

Grigson mentioned that Bastar Parjas were averse to calling themselves Parja and instead called themselves Dhurva. This statement is proved by the fact that in 1931 they were recorded to be 17569, in 1971 to be 7256 and 1981 to be only 900. In 1981 census they appear to have been included under Gonds. This tribe is concentrated in south eastern parts of Jagdalpur tehsil and extend thinly upto Sukma. There are isolated families of Parjas around Jagdalpur. Parjas are the best dancers having varied and pleasanter dance movements.

The tribe is more backward as compared to Bhatras and their neighbour Bison horn Marias. They are mainly cultivators and gatherers of forest produce. Their dwindling number either on account of their selfwill or otherwise make them an exposed community which need economic protection.

#### **Halbas**

Halbas are scattered over most of the north and central parts of Bastar. Their language Halbi has become the principal language of Adivasis in the area of former princely State of Bastar. They have undergone acculturation to the extent of being almost Hinduised.

The strength of Halbas according to 1981 census is 69755 persons. They have shown a steady growth since 1931 and their growth registers slightly over 6.6 per cent per annum during the last fifty years.

They are mainly cultivators and their exposition to outside influences have made them more suitable to adapt themselves to the changing social conditions as compared to other tribals. They consider themselves superior to Gonds whom they consider backward and uncivilized. Their agricultural practices, however, are not above those commonly practised in the region.

## Dorlas

Dorlas are concentrated in Konta and Bijapur tehsils at the border of the district in a narrow strip where it meets Andhra Pradesh and Orissa. The tribe is believed to be Gonds. Their name is believed to have come from Dor Koitor i.e. Gonds of low land area. They have been greatly influenced by Telugu culture and language. The exact strength of the tribe has not been given in 1981 census, but they are estimated to be 30 thousand to 38 thousand strong. Dorlas are relatively developed as compared to their Bison-horn Maria neighbours but those living in the deeper regions of the forests are poor and closer to their Dandami Maria cousins.

Dorlas are settled cultivators and live in permanent villages. Their villages have invariably a rest house known as thanagudi. Dorla houses are flimsy and roofed with leaves of Toady palm where they are not thatched. They select the site of their villages by the side of water on account of the climate which is hot and dry and water is a constant necessity. They are good farmers and prepare their fields with ploughs. Their crops are paddy and a few varieties of millets. They take jowar. In spite of the fact that they live by the side of water they do not irrigate their fields generally.

Dorlas keep cattle in addition to poultry and pigs. They milk their cows and prepare ghee. They possess Ongole breed of cows. Nistar land is used for grazing cattle. However, bullock carts are not common.

## Murias

Murias can broadly be categorised into three main types ; (i) Murias (ii) Jhoria Murias & (iii) Raja Murias or also known as Jagdalpur murias. Murias as a tribe has been made known by their famous institution of Ghotul which sets them apart from other tribes culturally. The institution is losing its prominence among Murias as a result of their growing interaction with other classes of people where different standards of morality are in vogue. Jhoria Murias are the community

inhabiting eastern foot hills of Abujmar hills and extending upto Kondagaon tehsil. From Mardapal they are spread northwards occupying parts of Narayanpur tehsil and extending into Antagarh through the valley of Rowghat and Metalghat hills. The term Jhoria Muria has become less current in use. Raja Maria are a community which is concentrated in Jagdalpur tehsil and more so around Jagdalpur towards Bastar development block. They are Murias who have changed substantially as compared to other Murias owing to their frequent interaction with the State officials as well as people belonging to different religions and social systems. The term Raja as a prefix is considered to be on account of their being associated with the service of the State of Bastar. They consider themselves superior to the Murias of the north. They have lost most of their old culture and have contracted Hindu traditions in whose constant contact they are living. They are greatly exposed to external influence. The Murias of the north are also exposed to external influence particularly that coming from their neighbouring areas. They have also changed greatly. Probably owing to the existence of Ghotul they as a community are less tense and social distortions are the least in this community.

Murias are generally cultivators and they practice settled cultivation. The land is not under communal appropriation. Their method of cultivation is not different from that of northern parts of the district. Murias have permanent fields which are properly ploughed and sowed. Murias living near the hills also practise shifting cultivation but to a very small extent. This form of cultivation is mostly motivated by the necessity of having something to eat till the harvest of their cultivated fields arrives: The most intensive form of cultivation is seen in the Bari or enclosures near the house of Murias. The Bari is a field of varying size situated close to their house mostly in the front or in the back of the house. The field is most carefully fenced, manured and enriched with sweepings of the house and droppings of the cattle throughout the year. Bari is used for sowing oilseeds like mustard, til etc; condiments, beans vegetables, fruits and tobacco. The techniques of agricultural operations are traditional. Sowing, harvesting, threshing, winnowing etc; are generally carried out by males. They also function

as food gatherers from forest but this mostly engages women and old man. They also work as agriculture labourers and willingly work with government agencies for wages.

Murias do not take milk or ghee. Even the children are not given these items of food. They are not professional fishermen but they eat fish and catch it from tanks and fields. They like drinking and do it with pleasure. Mahua liquor is offered to the Gods at festivals and they consider it duty to drink it. But they also take juice of sagopalm and lenda, a form of rice beer.

Clan and family dominate murias social life. A large number of cross consin marriages are performed amongst them and majority of marriages are according to parents' wishes in spite of the institution of Ghotul where young boys and girls live together and develop intimate relations. Social control is in the hands of clan elders and their decision for the clan is final. Not that there is no exception but as a rule clan and community is still the binding force for murias.

Murias have Hindu religious beliefs. They believe in the continuity of all existence but their relationship with God is personal.

Murias are clean and industrious. They are good cultivators. They believe that they should not fail in their agricultural pursuit. They are hardy, active, well behaved. They are poor but hospitable people. During the independence movement few Murias in the western parts of the district were influenced by Gandhi and bought Gandhi cap at the time of Satyagraha agitation. Murias in Jhoria region are beautiful, charming and hospitable. They are said to be Marias from Abujhmar who crossed the hills and never went back.

Murias live at permanent village sites. The houses in the village are arranged in streets and open onto one another. Their houses are poorly but spaciouly constructed and they are generally kept clean. They treat their neighbours well. They can withstand change better than other tribal communities.

## **Marias**

" The Marias of both kinds are very hospitable . The occasional stranger from other Kaitor villages or minor state official is housed and fed, provided he does not outstay his welcome or attempt to be exacting in his demands. Cooperation, in service to the State, in village festivals, in felling for Penda cultivation, winnowing and storing of grain, in fishing and hunting, is the key to the social life of hill maria who is a natural communist; his hospitality is perhaps mainly an expression of his ingrained cooperation. The Bison horn Maria is more of an individualist, or rather less of a communist, than the hill man.. All Marias are extremely grateful for any benefit received and sympathy and interest" Mr. Grigson has observed the above in characterising the Maria of Bastar and the observation comprehensibly covers their life style, attitudes and social philosophy.

Marias of Bastar may be categorised in two main divisions, viz., Hill Marias and Bisonhorn Marias, the names given by Grigson. The former name originates from the habitat which are the high hills of Abujhmar region and the latter on account of horned headdress which these Marias don while dancing although bison is said to be nonexistent in the region and the horns used by these Marias are those of Gaur. Hill Marias are mostly concentrated to the north of Indrawati river in a region made inaccessible by high mountains. To the south of Indrawati in Jagdalpur, Dantewara, Bijapur and Konta tehsils are Bisonhorn Marias. The areas are also exclusive for these marias although a few have spilled on both sides of the river.

### **Hill Marias**

According to 1931 census Hill Marias numbered 11500 and in 1984 they have become 16026 according to the survey conducted by Abujhmar Development Agency. This gives a growth rate of less than one per cent per annum. Considering the immigration of hill Marias from Zamidari as mentioned by Grigson the rate of growth of population of Hill Marias is considerably low.

Hill Marias of Abujhmar are the only class of tribals of the district who are not influenced by outside forces. They are among the most primitive tribes and they have a distinct ethnic entity which tells them apart from the neighbouring tribes. Hill Marias are extremely shy and simple. It is surprising that these people who are not afraid of wild animals and meet the unkind nature bravely are morbidly afraid of strangers from outside the area and flee at their sight to the nearest protection of the jungle and hills. But they are friendliest persons once they get over their shyness and show quick intelligence and humour. "Actually their mental processes are not unlike ours when allowance is made of their centuries of isolation". They are hardy people with great physical powers for endurance.

Hill Marias live in small villages according to the convenience of their cultivation but not always. Their villages have traditional well marked boundaries and there is a small no mans land between two villages. Houses open onto a open space in the centre. Bari is not attached to each house. The village has generally a common dormitory and a row of granaries for storing grains. Behind each row of houses will be found rows of pigsties, at least one for each house. The village site is generally changed according to the needs of Penda or shifting cultivation. But this tendency is gradually being abandoned and cultivation of remoter slopes under penda is practised when the surrounding slopes are exhausted. The cultivation at permanent sites is also increasing. The survey conducted by the Abujhmar Development Agency shows considerable area under stable cultivation.

Total area under cultivation (ha.)	Settled cultivation	Area Penda cultivation	Penda Percentage to total
1	2	3	4
12788	6122	6666	52.0

From total Penda cultivation to 52 per cent Penda is a considerable improvement.

Hill Marias are entirely dependent on cultivation and forest produce. They do not use plough. They however, optimise the use of their Penda land. The penda land is allotted by the community according to the need of the family determined by the size of the family. Penda fields are prepared in the month of February-March and sown at the occurrence of the first showers of the monsoon. The sowing is divided in two parts, first sowing is done in a part of the field and the seed is of early variety of Kondon. The second sowing is done in the rest of the field in June, July. The first sowing is harvested by the end of July and the third sowing of Kosra and pulse is done in the harvested area of the field by the end of August. The second sowing is harvested in November-December and the third sowing in the month of December-January. It would be clear that hill maria is continuously engaged in cultivation right from May to February of each year. The crops raised are Kondon, Kutki, Bajra, Sawa, Urd, Arhar, Moong, Kulthi and vegetables. Paddy has also been introduced in areas of settled cultivation. Tobacco is also grown in some fields particularly in fields nearer home

#### **Bison horn Marias**

Bisonhorn Maria of the open tracts have given up their shyness owing to steady expansion of communication facilities and frequent visits of official and development functionaries thereby coming into contact with the outside world. They are more advanced and sophisticated as compared to hill marias but are nevertheless backward. Cultural differentiation has taken place in the tribe due to their wide dispersal over a large tract of the district. Those living in the remoter parts are still shy and more primitive. They are just taking to settled cultivation and Penda cultivation is still found among them. Bisonhorn Marias living with non tribal or in areas with easy communication facilities have taken to settled cultivation. They use plough and irrigate their fields. Paddy is their main crop but they also take pulses, oilseeds, tobacco, sugarcane, and vegetables. They have Bari attached to their house where they cultivate intensively and all important crops are grown there, such as Maize, Mustard, Tobacco, Chillies,

Tomatoes and vegetables. They have started to take wheat in their fields. Some of them fight shy calling themselves Marias and instead call Murias particularly around Jagdalpur.

Bison horn Marias are introvert as compared to hill marias and do not intrude upon others without being asked. They are touchy, have a sense of selfrespect and can wait for taking retaliation.

These are then the communities which constitute major portion of tribal population and by their activities form economic and social atmosphere. Any development strategy will have to take into consideration inherent dimensions of social polity, the quality of these people, their natural limitations and their organisations for dovetailing development programmes in order to bring social change.

#### **Social Organisation and Production**

The village is an agglomeration of production functions carried out by different producing families having a certain degree of mutual inter dependence. Tribal economy based upon internal logic of production and mode thereof assumes different organisational patterns. The most primitive organisational system is supposed to be in communities which have communal control over land and where villages are shifted according to the need of cultivation. The community controls and appropriate the asset among various families according to their need. They control a certain well defined territory within which they move about and their village has little meaning in terms of defined area. The boundaries of the village are in a fluid state yet it has a definite shape and serves as a key economic unit. Production is organised by the community with individual families working independently for themselves but cooperating in activities demanding input of labour more than the family can provide. The means of production are treated communal but the material product of labour belongs to the family. Social life arising out of such economic organisation is necessarily community or clan oriented and as such is controlled by the society. Judicial and Penal Powers are exercised by the chief of the clan or the village council. Mostly such villages are monoclan organisations and their inter village



social relationships are controlled and guided by community Panchayats. In the course of time depending upon the availability of land for meeting the growing needs of the people of the clan separate settlements sprung up belonging to different clans having specific social relationships according to the rules of exogamy.

The other organisational pattern wherein land is under private appropriation is considered more dynamic because it provides more opportunities to the owner to improve his assets both quantitatively and qualitatively. In communal appropriation there is no urge in the individual to improve the quality of his land since it is not certain that he will get the same land next time. Primitive economy based upon settled agriculture having cultivated land under private appropriation emerges after overcoming all the limitations arising out of communal control. Herein cultivated land is inherited within the family. The family is solely responsible for managing the land and organising production, retaining control over both the means of production and the produce. The demand for extra input of labour is not met from communal pool free of cost but has to be managed by paying a cost for it. Consequently, either technology base has to be improved or the loss of land compromised. Where land owned by the family falls short of the requirement it again necessitates technological improvements and diversification of economic activities. The growing pressure on land and increasing demands of the family bring modifications in the techniques of cultivation and acquisition of different skills such as carpentry, iron smithy, tool making and for meeting non agricultural needs e.g. pottery, weaving etc. But these skill practitioners continue to be cultivators. It takes further division of labour and specialisation when these become independent professions and generate inter community trade. This type of production organisation does not break the community or clan but inspite of community control on social life, economic life becomes independent.

Another organisational pattern emerges with continuous redistribution of land wherein either on account of land going to relatives

none having been survived in the family or appropriated by capital providers or going out of control for other socio-political reasons, a section of deprived cultivators is created which does not own land and members work as tenants or wage paid labourers. The tenants share the produce with the owner but do not get control over the asset. The members are however, integral part of the community to which they originally belonged.

In the existing situation the district manifests all the three forms of production organisations. The first form of organisation is available in Abujhmar region of the district although not in the purest form since, of late, settled agriculture has made inroads in that area. Yet shifting cultivation is still practised and communal control over social and economic life of the people is still evident. This is the area which has been least influenced by outside forces and a smaller population living in a bigger area still has resources to exploit in a primitive manner.

The second and third forms of production organisation are prevalent in most of the district. Some 89 per cent of total workers are dependent on agriculture; 72 per cent cultivators and 17 per cent agricultural labourers. Most of the tribal cultivators are owners of land controlling about 80 per cent of the area under land holdings. It is the tribal component of 17 per cent of the workers who have, in the course of time, lost control over the land and are now participating in carrying out production for others. The tribal component of the remaining 11 per cent of the workers is otherwise engaged.

In identification of tribes according to prevalent production organisations, Hill Marias of Abujhmar region are the only tribe where communal appropriation of the land asset is even now in evidence. Here the social, political and religious authority is vested in different authorities from Pargana Majhi to the village Gaita. In some areas the village gaita performs both as religious and secular headman. In scattered villages each has a village gaita and the gaita of the parent village can interfere with the decisions of the village gaita.

The Pargana Majhi no doubt is the authority but he cannot function without proper consultations with the village elders. This is because of natural democratic tendencies of the tribe and even the Pargana Majhi has to act according to the majority opinion since his authority can only remain unchallenged so long as he executes majority decisions. The Panchayat deals with all cases arising out of social living including small criminal cases. Bigger criminal cases are reported to the administration of the district. However, Hill Marias are not criminal minded people and there are virtually no serious criminal cases.

In areas inhabited by Bisonhorn Marias there are Pargana headmen with wide influence and authority. These Pargana headmen do not get their authority like the Pargana Majhi of Abujhmar hills. The State have conferred authority on them. They have to deal with villages of many different clans and for larger number of villages as is not the case in Abujhmar area. In Bison horn Marias village panchayat exercises more real authority and Pargana headman has greater independence in action. Here it is more important to select the right man for the area as there is a recognised rule among tribals as to which clan the headman should belong. He is the appellate authority for the judicial decisions of village panchayat. The Bisonhorn Marias have always been in contact and more ready to learn from outside world and therefore more difficult. The area being multiclans and multitribe, village panchayats are not solely based on a single clan representation but the village headman is generally from the tribe traditionally providing leadership in such matters. However, things have changed and non-tribal organisational philosophy has begun to influence the formation of panchayats.

Murias' country has Pargana Majhis and village Majhis. Panchayats are constituted according to clans. Village elders have sufficient authority. Murias, like Bisonhorn Marias, have been in constant contact of nontribals and have in the process, gradually adopted many Hindu practices. Young boys and girls generally live under the authority of Ghotul managers where there is a well defined hierarchy and

obedience to the head and his deputies is a necessary condition. Outside the Ghotul they are within the jurisdiction of village panchayat. Each village holds its own panchayat composed of a few village elders and presided by village headman. The village headman is generally a hereditary post. Over a group of villages is the authority of Sendhia who decides intra communal disputes.

Every tribe has a system of village Panchayat and a higher authority for the clan or community depending upon the area to be controlled. In bigger areas there are well defined areas for the jurisdiction of clan or community Panchayats. However, village Panchayat is restricted to the village. These organisations have lost much of their legal authority with the coming of democratically elected panchayats. Yet these panchayats play an important role in formulating social life of the tribals and influencing their responses.

#### **Economic diversification**

The major portion of workers constituting about 89 per cent is dependent upon agriculture. The rest 11 per cent constitute the work force engaged in household industries and other non-agricultural activities. Again, the major portion of this category that is about 73 per cent or 8 out of 11 are working in rural areas. Of the total workers in rural areas about 1.5 per cent are engaged in household industries and 6.5 per cent in other nonagricultural activities. The distribution of nonagricultural establishments in the district would be helpful in determining the degree of diversification of economic activities in various areas. For this purpose urban area has been left out and so also workers engaged in urban areas. These activities cover such establishments which are being run by individuals as self employment ventures with or without wage paid employees and include major economic activity groups. The distribution is presented according to development blocks in such arrangement which may, to some extent, be coterminus with areas of different tribal communities of the district.

## No. of Non-Agricultural Enterprises

Development Blocks	Major Activity Groups											
	1	2	3	4	5	6	7	8	9	10	11	12
Durg Kondal	-	231	-	2	70	4	-	-	6	5	76	-
Bhanupratappur	-	410	-	-	278	30	5	3	12	35	222	-
Charama	-	1055	-	1	239	8	-	7	8	12	194	-
Kanker	-	717	-	1	204	22	5	4	6	18	183	-
Sarona	-	506	-	-	226	25	1	2	12	8	157	-
Narayanpur	-	551	-	4	268	15	5	4	8	2	567	-
Koilibeda	-	245	-	-	1738	42	10	-	6	10	232	1
Orchha	-	389	-	-	20	4	-	-	2	1	17	-
Angagarh	-	146	-	-	95	12	-	-	7	2	100	-
Keshkal	-	302	-	-	246	16	8	-	10	3	127	-
Baderajpur	-	490	-	1	182	9	-	-	4	1	101	-
Makdi	-	203	-	1	51	6	-	-	2	1	91	-
Pharasgaon	-	290	-	2	64	10	-	-	9	1	116	-
Kondagaon	-	592	-	-	70	6	-	-	4	-	127	-
Bastar	-	542	-	12	160	25	1	-	6	3	166	1
Bakawand	-	939	-	1	336	49	1	1	13	1	133	1
Jagdarpur	-	543	2	1	149	34	-	8	4	-	126	-
Lohandiguda	-	346	-	-	147	10	-	1	4	2	92	-
Bastanar	-	108	1	-	36	5	-	1	3	1	43	-
Tokapal	-	362	-	-	79	18	-	1	4	3	93	-
Darbha	1	820	-	-	30	7	-	3	3	1	52	-
Bijapur	-	86	-	-	79	11	-	1	1	3	104	-
Bhopalpatnam	-	232	-	1	123	7	-	-	4	2	91	-
Bhairamgarh	-	22	-	-	14	3	-	2	-	1	84	-
Usoor	-	13	-	-	555	3	-	-	1	2	78	-
Dantewara	12	145	10	2	197	-	-	2	12	4	177	-
Geedam	-	94	-	-	66	-	-	16	8	1	136	-

Contd..

	1	2	3	4	5	6	7	8	9	10	11	12
Katikalyan	-	53	-	-	3	-	-	-	7	-	40	-
Kuakonda	-	53	-	-	19	-	-	1	6	1	56	-
Chhindgarh	4	204	-	-	32	5	-	3	4	1	187	2
Sukma	-	144	1	-	122	15	-	-	6	32	161	-
Konta	-	84	-	-	230	11	1	10	2	2	138	-
Rural Total:	17	10919	14	29	6128	412	37	70	184	159	4271	5

Economic Census of Madhya Pradesh - 1980.

**Footnote**

Major Activity Groups : 1. Mining and Quarrying, 2. Manufacturing  
Repairing Services, 3. Electricity Gas and  
Water, 4. Construction, 5. Wholesale and  
retail trade, 6. Restaurants & hotels,  
7. Transport, 8. Storage and warehousing,  
9. Communication, 10. Financing, Insurance,  
Real Estate and Business Services,  
11. Community, Social and Personal Services,  
12. Others.

The total<sup>of</sup> establishments in rural area comes to 22245 and in them  
46998 persons are engaged as full time workers. These constitute  
slightly more than 6.0 per cent of total rural workers.

Non-agricultural establishments in urban areas of the  
district number 4783 with employment of 17793 persons. This constitutes  
about 43.6 per cent of the total urban workers.

Non-agricultural establishments if distributed according to  
the area of dominance of different tribal communities the breakup  
would be as follows :

Gond and Halba	5010	10757
Hill Maria	433	969
Maria	5629	11429
Muria	9607	20557
Bhatra	867	1804
Dorla	478	1013
Parja and others	221	469
	<hr/>	<hr/>
	22245	46998
	<hr/>	<hr/>

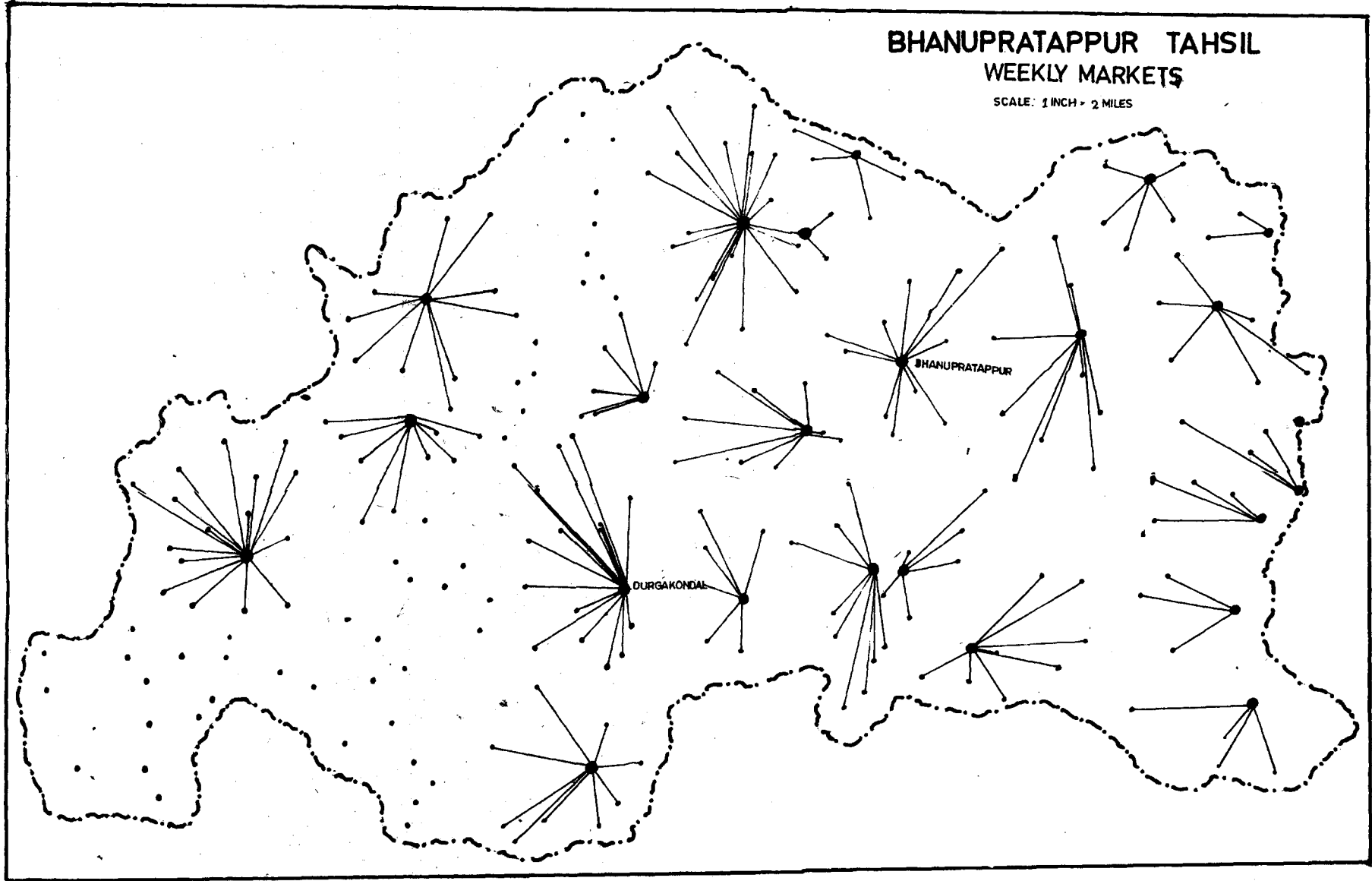
There is no way of saying as to what would be the proportion of tribal people in the above employment and what proportion of establishments would belong to them. But this distribution gives an idea of the non-agricultural sector in rural areas.

The rural area is mainly served by a chain of hat markets. Regulated markets for handling agricultural produce have been established in the district. These regulated markets alongwith their sub markets handled about 4.6 per cent of the total production of cereals and oilseeds in 1981-82. Agricultural production in the district is mainly for self consumption and there may not be much marketable surplus for the present. Nevertheless, tribal people bring part of their crop production, forest produce, and other commodities in small quantities to be sold in weekly hat markets. These hat centres play an important role in the life of the tribal both economically as well as socially since 'hat' are vital social contact points which no tribal as a rule leaves unattended.

Hat markets have evolved spontaneously and are concentrated in areas inhabited mostly by Gonds, Halbas, Marias, and Murias. Northern parts of the district possess more hat centres as compared to the southern parts and consequently average number of villages to be served by each hat market is less in northern area. Lack of markets and hat markets indicates the status of exchange economy. While

# BHANUPRATAPPUR TAHSIL WEEKLY MARKETS

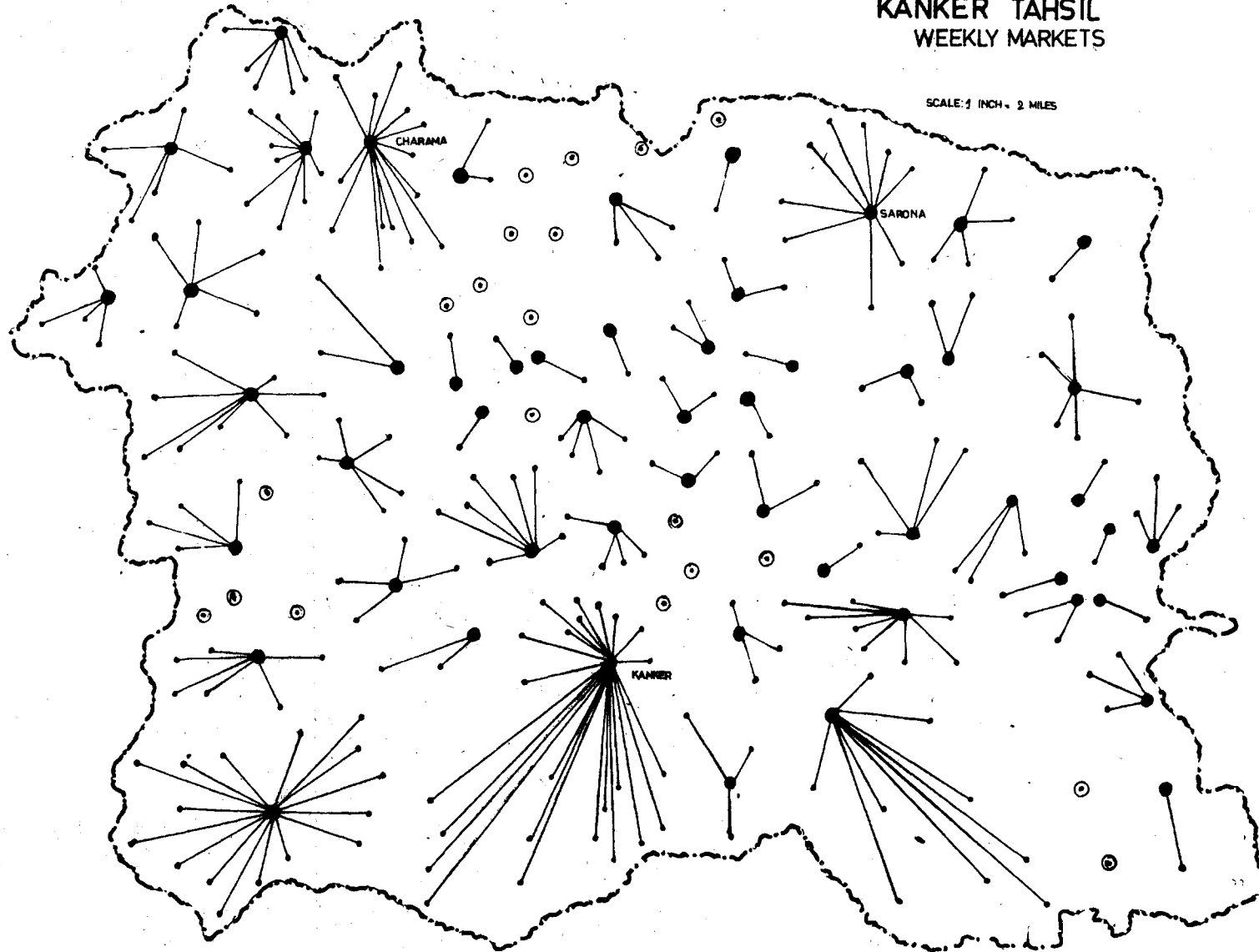
SCALE: 1 INCH = 2 MILES





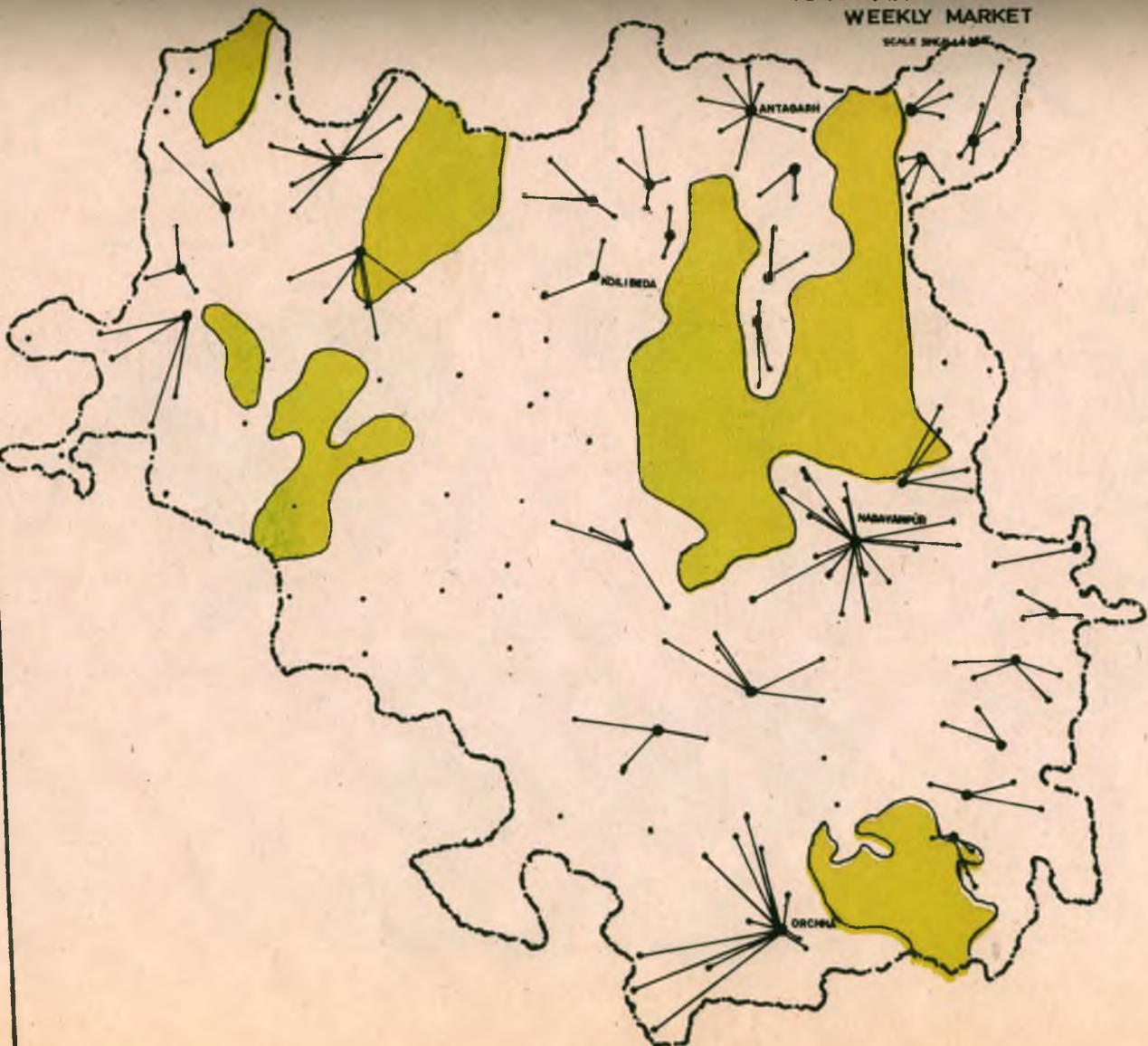
# KANKER TAHSIL WEEKLY MARKETS

SCALE: 1 INCH = 2 MILES



NARAYANPUR TAHSIL  
WEEKLY MARKET

SCALE 1:25,000



# KONDAGAON TAHSIL WEEKLY MARKET

SCALE: 1 INCH = 4 MILES



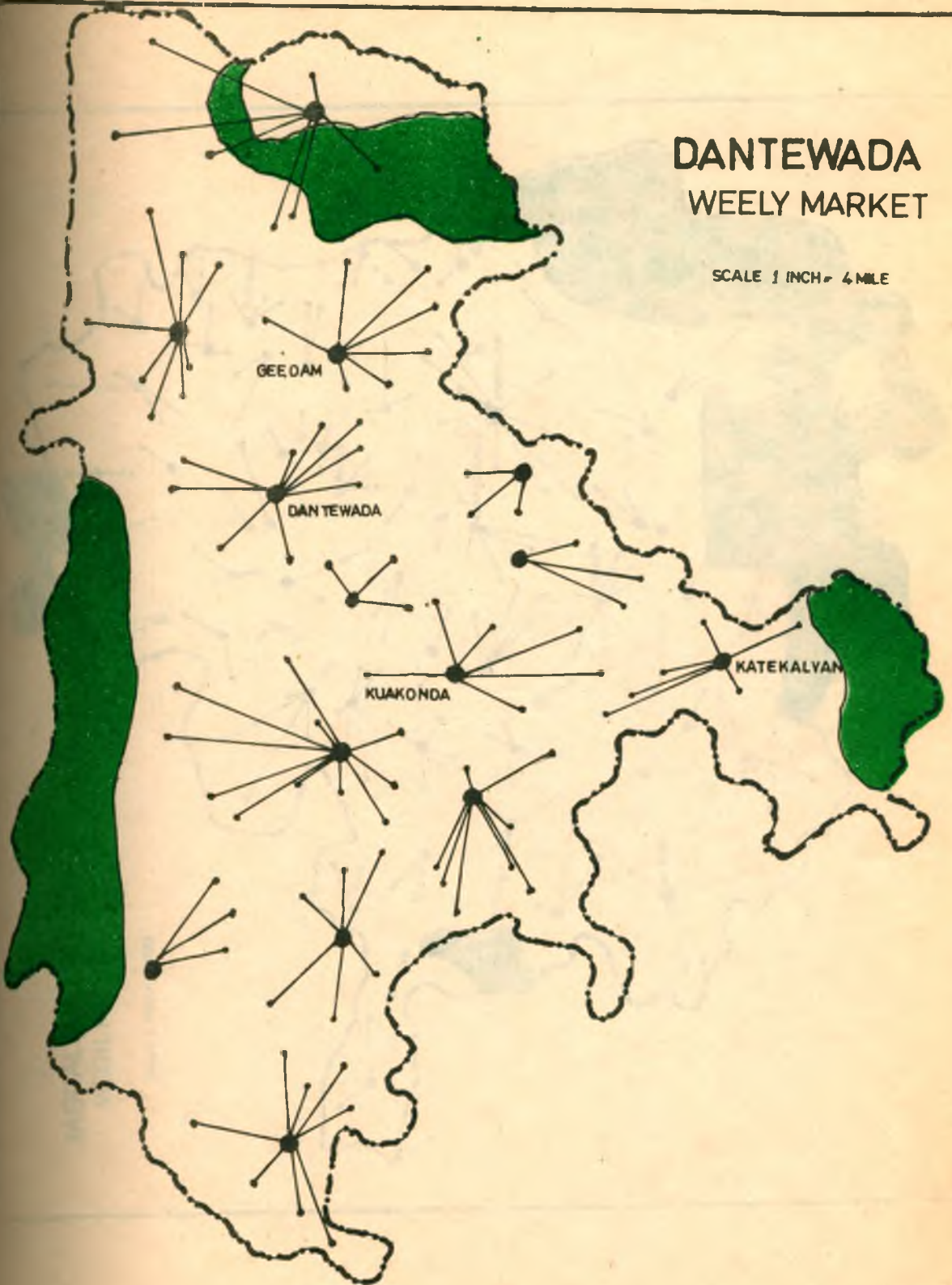
BIJAPUR TAHSIL  
WEEKLY MARKET

SCALE 1 INCH = 4 MILES



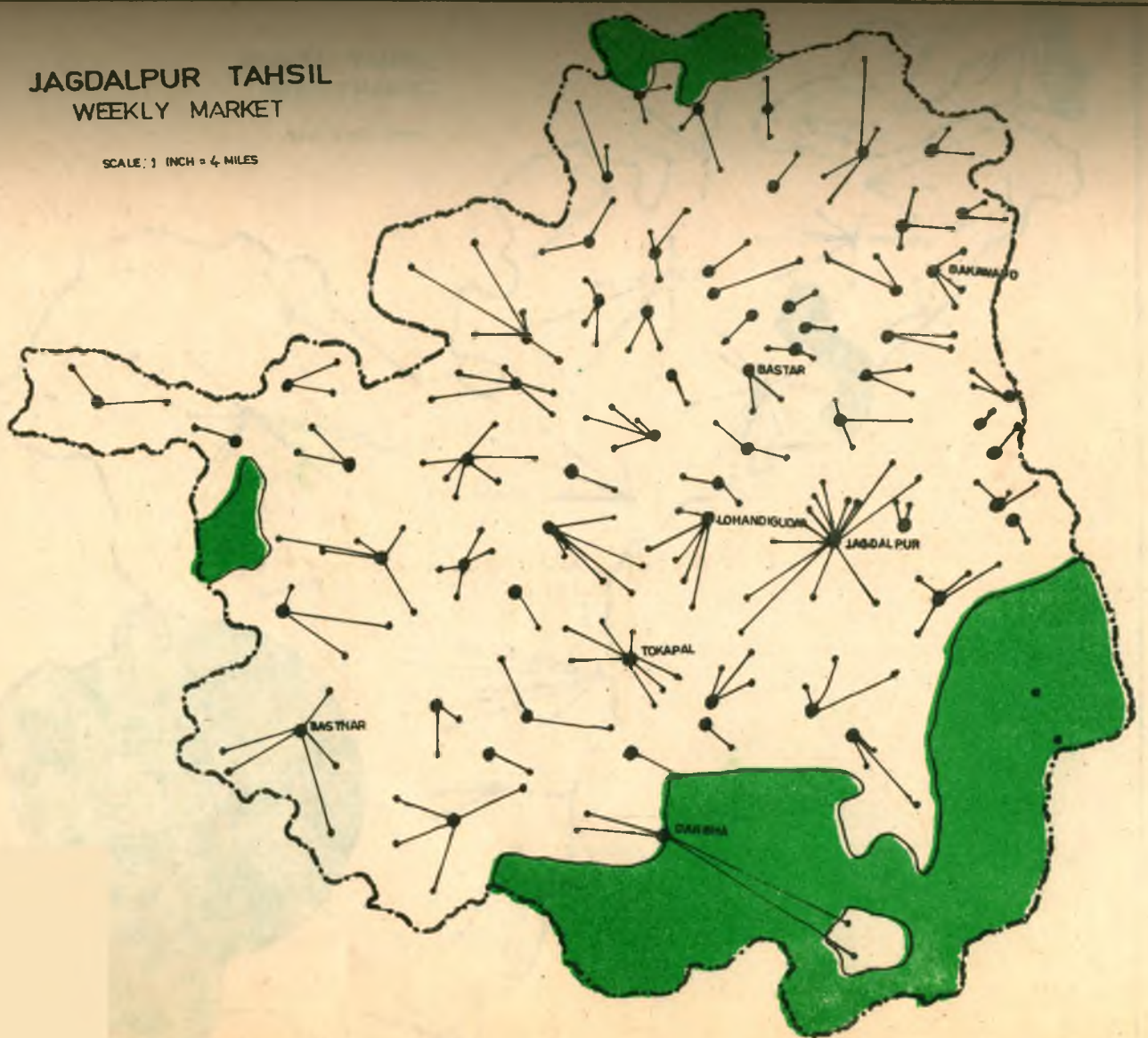
# DANTEWADA WEEELY MARKET

SCALE 1 INCH = 4 MILE



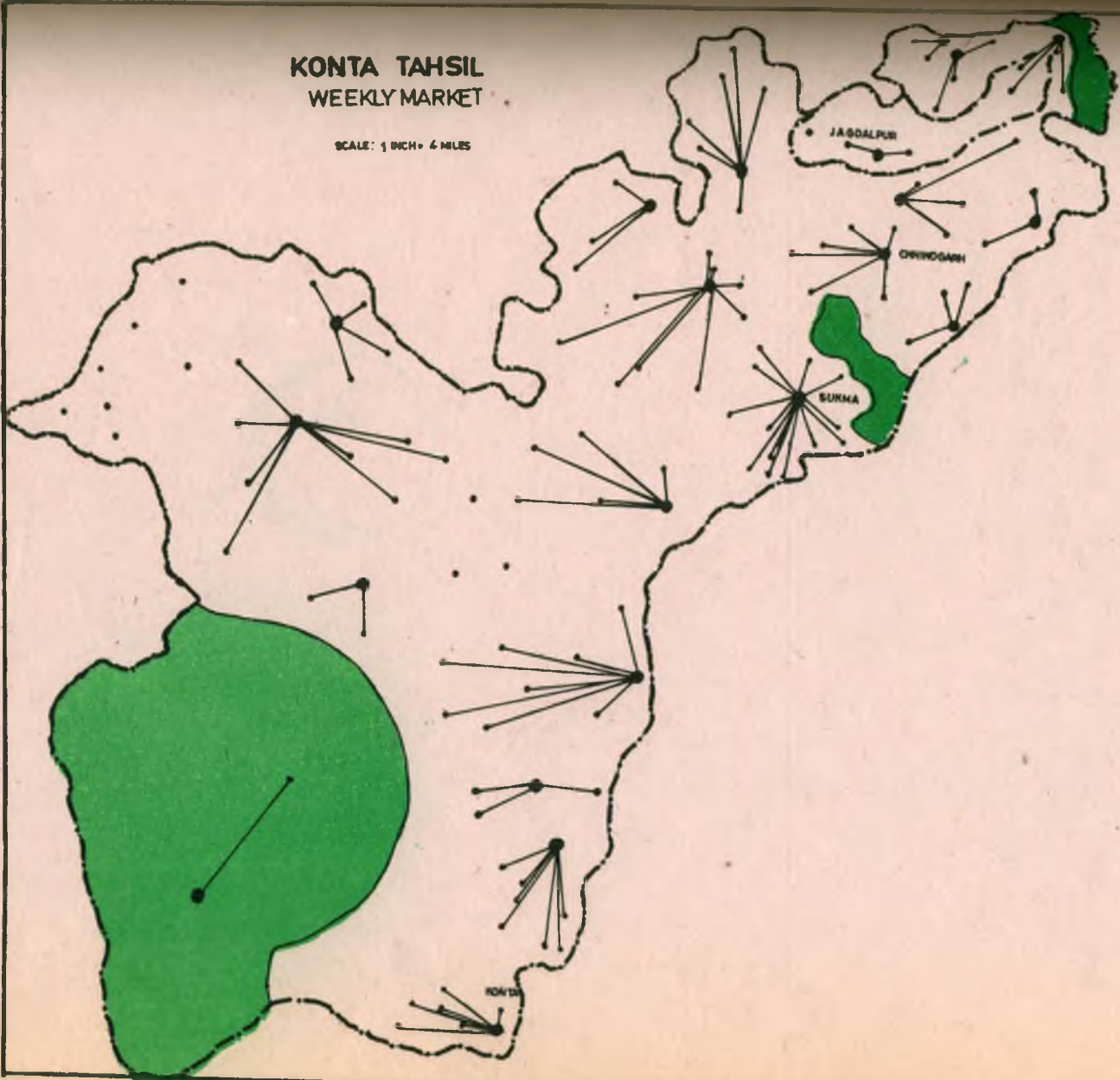
# JAGDALPUR TAHSIL WEEKLY MARKET

SCALE : 1 INCH = 4 MILES



# KONTA TAHSIL WEEKLY MARKET

SCALE: 1 INCH = 4 MILES



villages to be served by one hat market in Abujhmar area in the west of the district comes to 208, Charama in the north has only 4 villages per hat centre to be served. Similarly Usoor and Bhopalpatnam in the south have 33 and 70 villages to be covered by one hat market, Kanker in the north and Bakawand in the centre have 5 and 6 villages respectively to be served. This large variation in the number of hat markets in different areas also indicates levels of economic development.





## STRATEGY FOR THE DEVELOPMENT OF BASTAR

Bastar district is the largest district amongst the 45 districts of Madhya Pradesh. It is ironic that while this district is larger in area than Kerala and by no means less rich in resources and potential for development, it has remained one of the most backward areas of the country. It is a travesty of justice that while large amount of foreign exchange is being earned every year out of the iron ore extracted out of Bastar, not even a fraction of the value added by this largest mine of Asia has been spent on the development of Bastar. For even a casual visitor to Bastar, it presents the prospects of growth in all aspects of its economy - mineral resources, water resources, land resources, forest wealth and an excellent climate.

Bastar however is thinly populated by tribals who are primitive and who are showing keenness to develop themselves and get on to the main stream of the process of economic development. In the past development in the country had proceeded along sectoral lines, concerted efforts being made only for the development of definitive sectors like agriculture, industry etc. In concentrating their efforts to achieve certain targetted rates of growth in these sectors planners tended to forget the inbuilt tendency of such planning process to result in regional inequalities. While it is true that economists and planners have been aware of different theories of regional planning and the need to achieve a certain amount of regional balance in economic growth but, for some inexplicable reason growth in this country has not taken place in uniform manner.

In trying to evolve the strategy for the development of Bastar, we have considered various models of regional planning. We have found that these theoretical models evolved in a European situation per se did not have much relevance in the Indian context and particularly so for a district like Bastar, having unique features of

extraordinary resource endowment but a poor human resource base. Bastar also suffers from the most important drawback of total lack of communication facilities.

The focus of our attention in planning a strategy for the development of Bastar has been the Adivasi as an individual in Bastar. Our plans for development of agriculture, veterinary and animal husbandry, dairying and industry concentrate on making the Adivasi as a central point so that any development leads to the raising of his living standards. Basically an attempt has been made to improve economic conditions through improved technology in horticulture and agriculture and to develop new economic activities within the technological grasp and the ability of inhabitants of Bastar. Training in various fields will be provided with a view to make him more adaptive. Creation of a marketing structure to prevent exploitation by outside agencies has been contemplated. Evaluation of an educational pattern by which he is able to develop into a whole individual with ability to grasp modern technology and at the same time maintain his links with his traditional culture is necessary and last but not least is to make Adivasis feel that the whole strategy is designed to develop the majority of the population of the district and not with a view to exploiting Bastar's resources to the advantage of people outside Bastar.

It will be noticed from the following chapters that no attempt has been made to impose a technology which cannot be assimilated by the Adivasis. No attempt has been made to make massive investments for the exploitation of resources by setting up of huge capital intensive industries. In this we have been guided by the experience of other areas of the State where the setting up of huge capital intensive industries did contribute to the economic growth of the nation as a whole but did not have the desired impact in improving the economic conditions of the local inhabitants.

A close study of the pattern of agriculture in Bastar indicated to us that not all areas of Bastar are suited for cultivation of food crops and there are pockets in Bastar which are agro-climatically very

similar to Kerala and Karnataka. The traditional adivasi had learnt this and in his humble way has been exploiting these conditions by resorting to some primitive form of horticulture. In our strategy for agricultural development we have located these points in Bastar and will be concentrating on the development of highly productive income earning and long lasting plantation crops like coconut, cashewnut and mangoes. A scale economy approach will not be adopted but individual cultivation will be dispersed with community cultivation of these crops. Similarly in our strategy for developing veterinary and animal husbandry, we have located these areas where development of cattle wealth on modern lines would be easily acceptable and should also lead to the development of dairy industry in times to come. We have taken note of the fact that certain tribes of Bastar like the Abujmarias are opposed to the very idea of drinking milk and even milking their cows. We have also taken note of the fact that even though these parts are agro-climatically extremely suited for development of dairy industry, we have deliberately left them out because an attempt to develop it would only be an imposition on the adivasi of a culture which is totally alien to him. We have therefore chosen only those areas where this would be acceptable and would be easily absorbed. Here again we have kept the individual as the central point of our strategy.

Forest is the home of Adivasi. He has been living in the forests and out of its produce for ages. The development programme for forests in Bastar recognises this fact and envisages fuller tribal involvement so that an adivasi gets an opportunity to use the forests for his own welfare. The new plantations that have been planned, be it traditional forests or the new crops like coffee, rubber, roshagrass, bamboos, have been designed with a view to providing maximum employment opportunities. The Government of India have already declared certain large tracts of Bastar forests as biosphere reserves not to be touched by human hand but to be left alone. We believe that our strategy for the development of forests and forest wealth in

Bastar would provide enormous employment opportunities.

Irrigation development in Bastar will continue to lay emphasis on medium and minor irrigation projects. Fortunately, Bastar district has more than average rain fall as compared to other districts of Madhya Pradesh. Therefore irrigation in Bastar has not received the attention which other districts in Madhya Pradesh have received. About 25,000 hectares will be under irrigation through medium and minor irrigation schemes by the end of the VI Plan.

The development of irrigation in Bastar has therefore to be linked with the development of horticulture and agriculture. Introduction of modern agriculture has to be slow and gradual. While an ambitious programme for development of irrigation has been drawn up, the implementation will be linked with the development of agriculture.

As mentioned in the beginning there are close inter linkages of different development sectors. Under this plan, strengthening of the cooperative movement has been given a prominent place. The policy of the government is to extend and strengthen the cooperative sector of tribal areas in such a manner that the middle men are eliminated from the distribution of essential commodities as well as collection of forest produce. At present Bastar has 96 large size multi purpose societies, 11 at Block level, 82 at hat level, one service society and 2 farmer service societies. Entire structure of LAMPS would be reorganised with a view to opening one LAMP at every block headquarter and covering all the hat centres either by LAMPS or by the branches of LAMPS. The LAMPS would become the focal points for the Adivasi to market his produce, to receive credit and also provide opening to him for employment. They would also be used for the public distribution system.

As has been mentioned earlier lack of communications is a major handicap to progress in Bastar. It has been therefore given a high priority in our frame work. As far as Abujhmar is concerned there are no roads now. The proposal is to construct two or three arterial

roads in Abujhmar in such a way that the road is accessible from all villages at a distance of not more than seven miles. The centre of this circular area having a radius of seven miles is usually a big village which could develop in the future into a ground centre.

Looking to the rich mineral and forest wealth of Bastar, a Planner would be tempted to suggest rapid industrialisation of this district. Exploitation of its valuable resources might prove a boon to the State and to the nation as a whole. However, location of large industrial complexes in adivasi areas have to be done with great care so as not to create essentially an upheaval amongst them. The National Mineral Development Corporation is already exploiting in a very big way the rich iron ore deposits of Bastar. The Government of India have been considering since long the proposal for a pelletisation plant based on fines of the Baladila mines. Perhaps this proposal may be accepted during the VII Plan period.

Our plan for Bastar while it envisages the setting up of a few large units, concentrates more on providing the necessary facilities for the adivasi to develop his skills. The industrial strategy, therefore, is in two phases - the first phase envisages establishment of ;

1. Cottage and small scale industries based on resources from the agriculture and forests sectors.
2. Handicraft units.
3. Khadi and village industries.
4. Development of tassar & kosa silk.
5. Development of units that will eventually use the products of horticulture development.

All these units could be labour intensive using simple technology, that will benefit the common man in Bastar without disturbing his existing way of life. In the second phase, certain sophisticated industries have been proposed which include metallurgical industry and cement plant.

While it is not strictly relevant to mention the scope for power development in Bastar from the point of view of the strategy for the economic emancipation of the adivasis in Bastar, it is necessary to mention at least in passing the potential and the proposed programme for power development in this district. The Indrawati river alone is expected to provide potential for power generation up to 3600 M.W. The Bodhghat hydel power station is in an advanced stage of preparation. This project expected to generate 500 M.W. would be fully under implementation during the VII Plan. In addition to this, the plans are afoot to provide for another power station at Bhopalpatnam between the border of Madhya Pradesh and Maharashtra. This is likely to generate about 1200 M.W. The M.P. Electricity Board has prepared a detailed programme for laying transmission lines, electrifying villages for energisation of pumps for irrigation as well as providing domestic power connections.

In the social services' sector of Medical, Public Health and Education, the strategy envisages the coverage of the entire district. The programme that has been drawn up for coverage of medical facilities is to bring within the reach of the adivasi modern medical care through mobile clinics, free supply of medicines and continuous communication with the adivasis who has for the centuries believed in traditional forms of cure. Along with medical facility, ambitious programme of providing safe drinking water has also been drawn up to eradicate any scope for water bound diseases.

As the adivasi lives in scattered areas in Bastar and in spite of availability of a very large number of primary, middle and higher secondary schools, number of children have not been able to get the benefit. The strategy, therefore, envisages the setting up of Ashram schools where the child could live and learn in an atmosphere conducive to its way of life. Setting up hostel facilities would be provided wherever middle and higher secondary schools are available which will encourage the adivasi girls to take higher secondary education and

setting up separate high schools for them. Providing facilities for industrial training is also envisaged and community viewing centres for education through television would also be set up.

The Development strategy as outlined above is also to be viewed in the context of the existing spatial organisation in the district and what the spatial organisation would be and the standards of services that will become available after a period of development based on the strategy outlined.

The present Working Group has not gone into the question of modification of the existing administrative organisation set up as a Commission appointed by the Government is already seized of the matter. As regards the availability of different levels of services, an attempt has been made to depict them in a series of tables. The tables regarding the standards of services in Bastar as they exist now and as they would emerge on the implementation of the development plan for Bastar based on the strategy outlined earlier are enclosed as annexure to this chapter.

## APPENDIX

### Standard Services in Bastar District

Sl.No.	Major Head of Service	Standard of Service
1	2	3
I.	<u>Administration</u>	1. District, 2. Tehsil, 3. Block, 4. Revenue Circle, 5. Patwari Halka.
II.	<u>Economic Markets</u>	1. Regulated Markets, 2. Sub Regulated Markets, 3. Declared Markets, 4. Hats.
III.	<u>Educational Services</u>	1. Professional College/College 2. I.T.I./H.S.S., 3. Middle School, 4. Primary School/Ashram School.
IV.	<u>Transportation Services</u>	1. Bus stop
V.	<u>Economic Industries</u>	1. Factories 2. Household Industry.
VI.	<u>Commercial Services</u>	1. Commercial Banks 2. Co-operative Banks.
VII.	<u>Electricity</u>	1. Electrified Villages.
VIII.	<u>Medical &amp; Health Services</u>	1. District Hospital, 2. Civil Hospital, 3. P.H.C./Addl.P.H.C. 4. Civil Dispensary/Ayurvedic Dispen- sary, 5. Mini PH.H.C.
IX.	<u>Water Supply</u>	1. Safe Drinking Water



Development Plan for Bastar District  
Service Institutions emerging at the end of Seventh  
Five Year Plan

Sl. No.	Particulars	Existing	Proposed during VII Plan	By the end of VII Plan
1	2	3	4	5
<b>I. Administration</b>				
	1. Commissioner Headquarter	1	-	1*
	2. District Headquarter	1	-	1*
	3. Tehsil Headquarter	11	-	11*
	4. Block Headquarter	32	-	32*
<b>II. Educational Services</b>				
	1. Primary School	3347	-	3347
	2. Ashram School	52	150	202
	3. Middle School	542	-	542
	4. High School/H.S.S.	63	31	94
	5. Colleges	8	2	10
	6. Engineering College	1	-	1
	7. Industrial Training Institute (I.T.I.)	2	1	3
	8. Training-cum-Production Centre	3	3	6
	9. Opening of Integrated Child Development Service Project	8	24	32
<b>III. Commercial Services</b>				
	1. Co-operative Banks(Nos.)	2	-	2
	2. Co-operative Societies	110	54	164
	3. LAMPS	96	154	250

1	2	3	4	5
<b>IV. <u>Health Services</u></b>				
1. District Hospital	1	-		1
2. Civil Hospital	4@	-		4@
3. Primary Health Centres	36@	-		36@
4. Additional P.H.C.	32	-		32
5. Mini P.H.C.	50@	-		50@
6. Civil Dispensaries	68@	-		68@
7. Ayurvedic Dispensaries	48	-		48
8. Sub-Centre	497	-		497
9. Mobile Clinic	-	8		8
10. S.T.D. Clinic	1	-		1
11. S.T.D. Mobile Clinic	3	8		11
12. T.B. Clinic	1	-		1
13. National Malaria Eradication Unit	2	-		2
<b>V. <u>Economic Markets</u></b>				
1. Regulated Markets	7	22		29
<b>VI. Electrified Villages</b>				
	637	1519		2156
<b>VII. Safe drinking water (villages covered)</b>				
1. Problem villages	3141	127		3268
2. Problem hamlets	5410	1360		6770

\* Subject to change after the report of the Commission,

@ includes institutions of Dandkaranaya Project Authority.

Villages having all the 9  
Standard Services.

Sl.No.	Name of villages	No.of scores
1	2	3
1.	Jagdapur	22
2.	Kanker	20
3.	Narayanpur	19
4.	Bijapur	19
5.	Bhopalpatnar	19
6.	Kondagaon	18
7.	Bhanupratappur	17
8.	Lohandigunda	15
9.	Bastar	15
Total :		9

Villages having 8 Standard Services

S l.No.	Name of Villages	No.of scores
1	2	3
1.	Dantewara	18
2.	Charama	16
3.	Pharasgaon	15
4.	Sirana	12
Total:		4

Villages having 7 Standard Services

Sl.No.	Name of Villages	No. of Scores
1	2	3
1.	Geedam	14
2.	Konta	14
3.	Antagarh	14
4.	Darbha	13
5.	Keshkal	13
6.	Bhairamgarh	13
7.	Chhindgarh	13
8.	Koilibeda	13
9.	Bastanar	10
<b>Total:</b>		<b>9</b>

Villages having 6 Standard Services

Sl.No.	Name of Villages	No.of Scores
1	2	3
1.	Sukma	13
2.	Makdi	13
3.	Tokapal	12
4.	Bakawand	12
5.	Usoor	11
6.	Bhanpuri	11
7.	Dhanora	11
8.	Chhote Donger	9
9.	Aawapalli	8
Total:		9

Villages having 5 Standard Services

Sl.No.	Name of Villages	No. of Scores
1	2	3
1.	Kuakonda	11
2.	Bade Rajpur	10
3.	Durg Kondal	9
4.	Katikalyan	9
5.	Kutru	8
6.	Sambelpur	8
7.	Sampur	6
8.	Singanpur	6
9.	Kesherpai	6
10.	Karanji	5
11.	Salna	5
12.	Jagerguda	5
<b>Total:</b>	12	

Villages having 4 Standard Services

Sl.No.	Name of Villages	No. of Scores
1	2	3
1.	Badedonger	7
2.	Karandola	6
3.	Dahikonga	6
4.	Lakhanpuri	6
5.	Dhanora	6
6.	Koter	6
7.	Aamoda	6
8.	Hirapur	5
9.	Radhana	5
10.	Malmula	5
11.	Bibai Balanga	4
12.	Kerlapal	4
13.	Bada Tumnai	4
Total :		13



Villages having 3 Standard Services

Sl.No.	Name of Village	No. of Scores
1	2	3
1.	Kodekursi	5
2.	Mulo	4
3.	Mardapal	4
4.	Konguda	4
5.	Kahagaon	4
6.	Leda	4
7.	Govindpura	4
8.	Durdaha	4
9.	Umaradah	4
10.	Bhanbeda	4
11.	Lohatter	4
12.	Nagernar	3
13.	Dhanpuja	3
14.	Lajoda	3
15.	Piprabahagaon	3
16.	Mungapal	3
17.	Devera	3
18.	Karna	3
19.	Maragaon	3
Total :	19	

Villages having 2 Standard Services

S1.No.	Name of Villages	No.of Scores
1	2	3
1.	Dongukondal	3
2.	Bacheli	3
3.	Devera	2
4.	Lamker	2
5.	Kerpound	2
6.	Dilmila	2
7.	Ghotiyan	2
8.	Kachnar	2
9.	Sirisguda	2
10.	Paknar	2
11.	Chhote Devda	2
12.	Jabel	2
13.	Lalayguda(Lalguda)	2
14.	Bajabande	2
15.	Sergopal	2
16.	Rehaband	2
17.	Arda	2
18.	Aadenga	2
19.	Pandrabar	2
20.	Sonapal	2
21.	Golaband	2

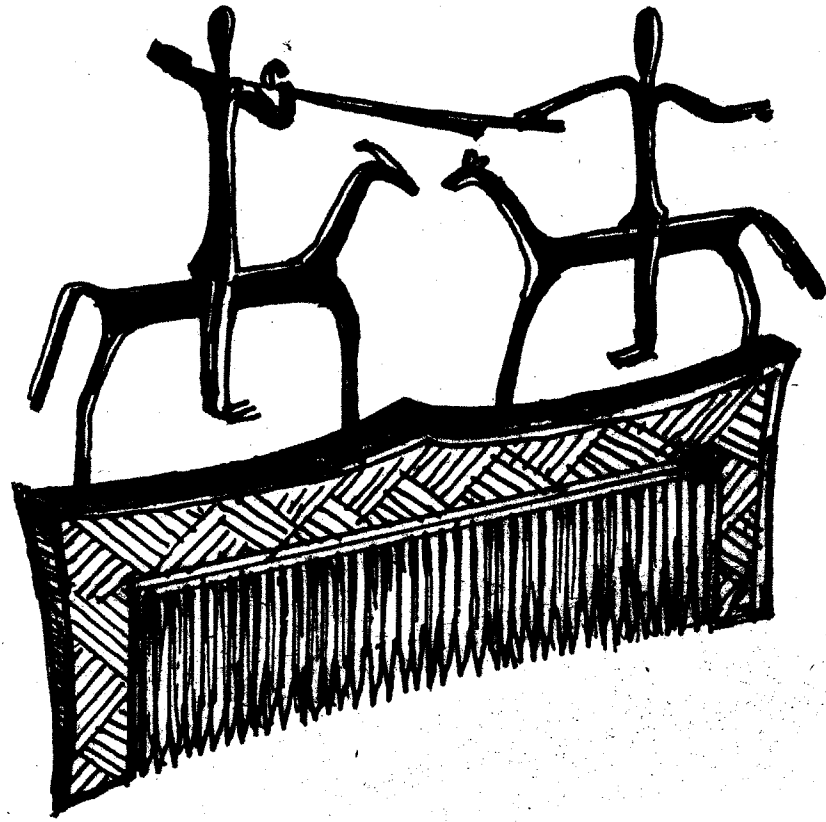
1	2	3
22.	Bamhena	2
23.	Bapana	2
24.	Borjonager	2
25.	Dornapal	2
26.	Arrabor	2
27.	Ramaram	2
28.	Pedaras	2
29.	Golapalla	2
30.	Kodrapal	2
31.	Patoda	2
32.	Porgaon	2
33.	Saletola	2
34.	Narherpur	2
35.	Sarbandi	2
36.	Badel	2
37.	Harradola	2
38.	Halba	2
39.	Pura	2
40.	Reyaband	2
41.	Wedyakor	2
42.	Benur	2
43.	Ilemido	2
44.	Warsur	2

1	2	3
45.	Nakulnar	2
46.	Palomar	2
47.	Hakondal	2
48.	Devrinar	2
<b>Total:</b>		<b>48</b>

Villages having 1 standard service

Sl.No.	Name of villages	No. of Score
1	2	3
1.	Abujhmad	3
2.	Badadonger	3
3.	Mundagaon	1
4.	Gorga	1
5.	Nangur	1
6.	Chhikapal	1
7.	Kalanar	1
8.	HurraKoder	1
9.	Alnar	1
10.	Lohagaon	1
11.	Marim	1
12.	Kadeknera	1
13.	Haragaon	1
14.	Chapai	1
15.	Bhangadader	1
16.	Jodekera	1
17.	Sarla	1
18.	Pirhapal	1
19.	Devinavagaon	1
20.	Dokela	1
21.	Kortala	1

1	2	3
22.	Kola	1
23.	Pratapur	1
24.	Dhawdaho	1
25.	Dumerkot	1
26.	Nagerbeda	1
27.	Mangloor	1
28.	Tomar	1
29.	Merpal	1
30.	Soornar	1
31.	Kadalo	1
32.	Kachche	1
33.	Nasurwar	1
34.	Mediya	1
35.	Bhanskanhare	1
36.	Selgaon	1
37.	Harkari	1
38.	Berhela	1
39.	Charari	1
40.	Amrawati	1
Total:		40



CHELIK AND MOTIHARI

# SECTORAL PLANS



## AGRICULTURE

### 1. General Review

The economy of the district is predominantly agricultural which is evident from the fact that about 89 per cent of the total workers recorded at 1981 Census were engaged either as cultivators (72 per cent) or as agricultural labourers (17 per cent). However, statuswise agriculture remains traditional and in some areas even primitive. The latter type of cultivation is prevalent in Abujmar area of the district where mostly shifting cultivation is practised. In other parts of the district settled cultivation has become common and in a few areas, in the north and central parts of the district particularly, improved technology has also been adopted. The northern part of the district has the advantage of being in the neighbourhood of relatively developed districts viz., Durg and Raipur and as a result of interaction with that area, agricultural technology has substantially been changed from that of the subsistence level practices. The western, south-western and southern regions of the district are still in the throes of traditional and rudimentary stage of cultivation.

### Soils

The soils occurring in the district differ from one region to the other. Broadly three types of soils are found in the district and are known in the local terminology as follows :

1. Marhan : It is the poorest quality of soil containing considerable mixture of pebbles and morrum and is suitable for only coarse crops of minor millets. The yield is also inferior as compared to other types of soil.
2. Tikra : It is relatively a better soil and is suitable for paddy, maize and oilseeds.
3. Mal : It is a loamy variety soil and is known to have better retentivity of moisture. It is suitable for late varieties of paddy.

The northern part of the district falling in the catchment area of Mahanadi possesses good soil which, by and large, can be classified into three categories, viz., (1) Kankar, (2) Dorsa and (3) Matasi. Kankar is heavy black soil while Dorsa is black soil having contents of sand and pebbles. Matasi is yellowish brown soil. The central parts of the district generally possess soils of a poorer grade with somewhat disproportionate mix of silica and quartz in Kondagaon area. There occurs sporadic patches of black cotton soil in the area adjacent to Orissa boarder in the east of the district. The southern parts of the district, again, are not good from the standpoint of soils. There occurs a large proportion of sand in the soils of Kanta tehsil with lower retentivity thereby making the soil suitable to only Kharif crops mostly millets and other inferior cereals. The soils in Bijapur tehsil range from loams to sandy loams and possess poor retentivity of moisture. These soils generally require irrigation for Kharif whenever rains are deficient. The soils are generally poor in nitrogen, moderate in phosphorous, moderate to high in potash and rich in forest humus.

#### Agro Climatic Conditions

The rains are received in the district both from southwest and northeast monsoons. They commence from the middle of June and continue upto September. During these months more than eighty per cent of the total rainfall is received. The rains are generally well distributed over the season as well as in the district. The average rainfall in the district ranges between 1300 mm. to 1600 mm. The variation between northern and southern parts of the district is not much as far as the dependability of rainfall is concerned. The following table gives the dependability status of rainfall based on the data recorded for over thirty years at various rain gauge stations in the district :

Region	Rain gauge station	Dependability of rainfall (mm)		
		50 per cent	75 per cent	90 per cent
1	2	3	4	5
North	Bhanupratappur	1436	1304	915
	Narayanpur	1408	1186	957
	Kondagaon	1373	1253	1023
	Keshkal	1464	1388	1041



1	2	3	4	5
	Jagdalpur	1469	1336	1091
South	Dantewara	1380	1247	922
	Bijapur	1591	1395	1082
	Bhopalpatnam	1660	1346	1123
	Sukma	1332	1151	1015

A well distributed rainfall of this intensity is a fair indication of the district receiving adequate rainfall during the season.

The climate of the district again show variations but not of a high degree. Generally, the climate of the district is hot and humid. The plateau is pleasantly cool but in the valleys and lowlands it is frequently found damp and unhealthy. The hottest month is May when temperature shoots up to about 45°C. December is the coldest month when mercury comes down to about 10°C. The period from December to February is generally dry and sometimes frost occur particularly in Abujhmar area.

Bastar district although one of the seven agroclimatic zones of the State can further be divided into four agroclimatic sub-zones, namely, northern, south-central, south-western and southern regions. Northern sub-zone covers Charama, Sarona, Kanker and Durgkondal development blocks. The agroclimatic conditions prevailing in these development blocks is similar to that of neighbouring Chhattisgarh region of the State. The rainfall is around 1200 mm. in a year and paddy is the major crop grown in this area.

South-central sub-zone is by far the largest which covers Antagarh, Koilibeda, Keshkal, Baderajpur, Pharasgaon, Makdi, Narayanpur, Kondagaon, Orchha, Bakawand, Bastar, Jagdalpur, Tokapal, Lohandiguda, Geedam, Bhairamgarh, Bijapur, Dantewara, Bastanar, Darbha, Kuakonda and Katekalyan development blocks. The rainfall in the area is around 1600 mm. in a year. The major crop of the region is also paddy but other crops have started coming up.

South-western sub-zone comprises Bhopalpatnam and Usoor development blocks where rainfall is about 1200 mm. in a year. Here also, paddy

is the major crop but jowar is equally important.

Southern sub-zone includes Konta, Sukma and Chhindgarh development blocks. Climatic conditions are similar as in the adjoining parts of Andhra and Orissa States. The rainfall is around 1200 mm. in a year but the soil conditions require water for irrigation. Crops like coconut, banana, cashew-nut, etc. can be grown in this area. However, presently, Kodon-kutki and paddy are the main crops grown in this area and in a few patches wheat has been introduced.

#### Land Use

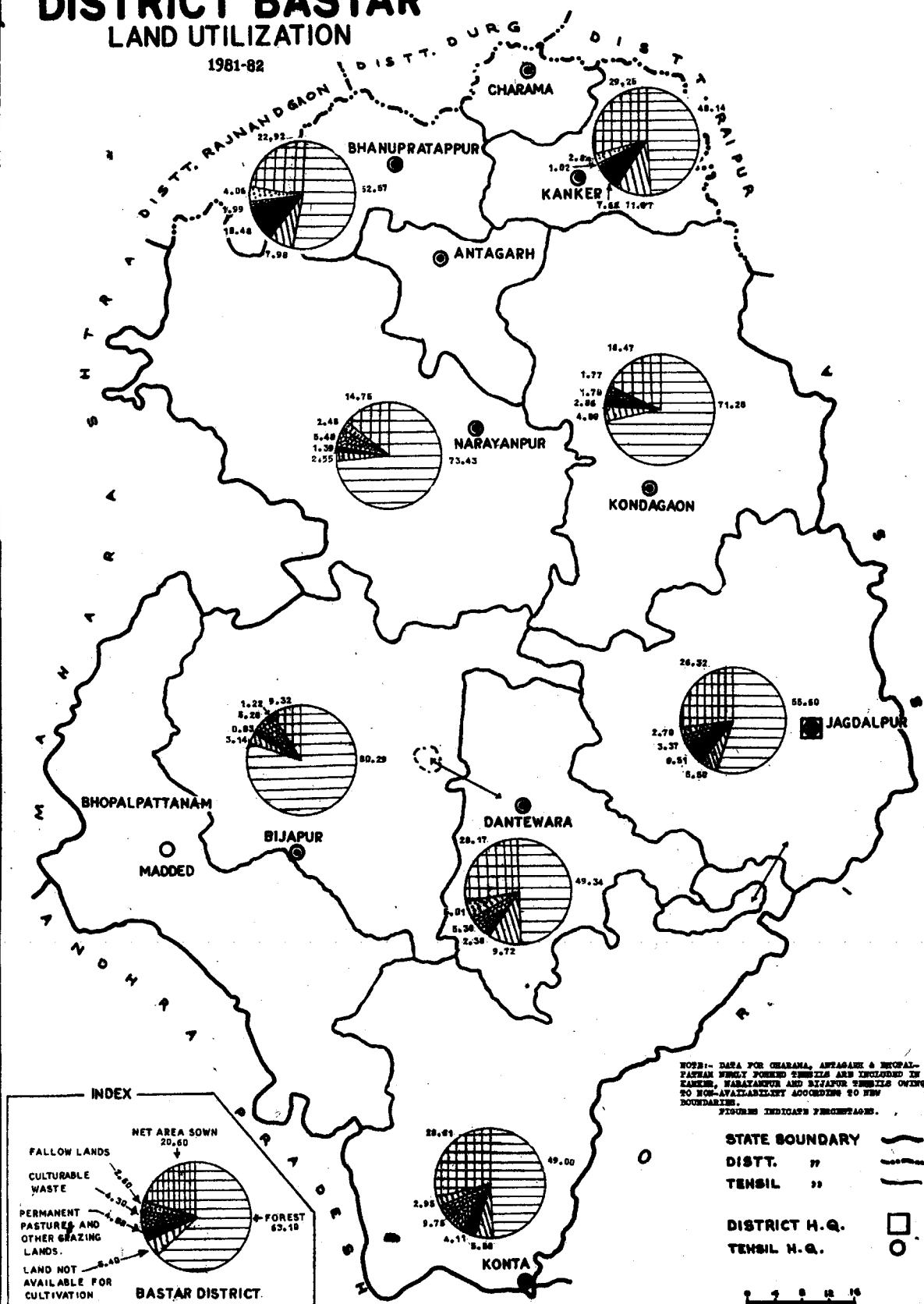
During 1981-82 an area of about 21 per cent of the total geographical area of the district was under cultivation without including the land left fallow currently. The area under current and old fallow lands was about 2.6 per cent of the total geographical area. Permanent pastures and grazing lands and culturable waste lands constituted about 8.1 per cent of the total area of the district. The following table presents the extent of the availability of land for cultivation purposes.

(based on 1981-82 data)

Land Use Classification (including old fallows)	Area ( '000 ha)	Percentage
Total geographical area	3906.0	100.0
Land not available for cultivation -		
(a) Forest	2470.6	63.3
(b) Land put to non-agri-culture uses	81.0	} 5.3
(c) Barren and uncultivable land	125.9	
(d) Other uncultivated land used as pasture and grazing land	152.2	
	<u>2829.7</u>	<u>72.5</u>
Land available for cultivation -		
(a) Cultivable waste	168.8	4.3
(b) Current fallow	45.9	} 2.6
(c) Old fallow	54.7	
(d) Net area sown	806.9	20.6
	<u>1076.3</u>	<u>27.5</u>

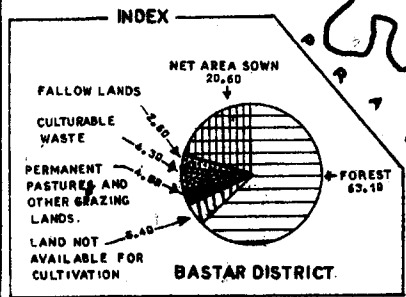
# MADHYA PRADESH DISTRICT BASTAR LAND UTILIZATION

1981-82



NOTE:- DATA FOR CHARAMA, ANTAGARH & BHOPALPATTANAM TEHSILS FORMED SUBSILS AND EXCLUDED IN KANKER, NARAYANPUR AND BIJAPUR SUBSILS Owing to non-availability according to new boundaries.  
FIGURES INDICATE PERCENTAGE.

STATE BOUNDARY ———  
 DIST. " " ———  
 TEHSIL " " ———  
 DISTRICT H.Q. □  
 TEHSIL H.Q. ○



The area available for cultivation in the district can thus be estimated on the basis of 1981-82 figures to be about 27.5 per cent of the total geographical area. However, there has occurred a slight change in the availability of area for extension in 1982-83 and it has been reduced to 24.5 per cent of the total available area. The distribution of cultivable area, net area sown and the likely balance for extension of cultivation in terms of area in the future is produced below on the basis of data for 1982-83. The regions are based on physical location on the map of the district.

S.No.	Region	No.of blocks	Total culti- vable area (ha.)	Net area sown (ha.)	Likely balance (ha.)
1	2	3	4	5	6
1.	North	5	1,66,527	1,40,812 (84.6)	25,715 (15.4)
2.	North-central	3	81,348	67,208 (82.6)	14,140 (17.4)
3.	Central	9	2,87,161	2,34,978 (81.2)	54,183 (18.8)
4.	West	3	85,356	53,965 (63.2)	31,391 (36.8)
5.	South-central	6	2,17,256	1,62,270 (74.7)	54,986 (25.3)
6.	South-western	3	71,889	37,252 (51.8)	34,637 (48.2)
7.	South-eastern	2	96,881	74,233 (76.6)	22,648 (23.4)
8.	South	1	69,912	41,630 (59.5)	28,282 (40.5)
Grand Total		32	10,76,330	8,12,348 (75.5)	2,65,982 (24.5)

Figures shown in paranthesis are percentages.

It will appear from the above that there is scope for the extension of acreage under cultivation particularly in western, south-western and southern parts of the district. It should, however, be remembered that these parts of the district still possess mostly high quality forest and although tribals have land for cultivation or can have for the asking, they do not engage themselves fully in cultivation owing to the fact that they get, in their reckoning, adequate provisions from the

forest for their proper upkeep. Their customs, traditions and annual engagement calendar have been determined very largely by their dependence on the forest. A study conducted by the Tribal Research Institute for assessment of dependence of tribals on sal forest has shown that in sal area forests they get as much as 33 per cent of their total income from forest usufruct. The development blocks located in the northern part of the district have shown about 85 per cent of the cultivable area under actual crops. Similarly, the development blocks in the north-central part of the district also have about 83 per cent of the total area under crops. Some development blocks, such as, Baderajpur and Keshkal have shown as high as 90 per cent of the total cultivable area under crops. The central part of the district also falls within the category of high cultivated area on an average. It registers about 81 per cent of the cultivable area under crops. The western sector has shown the lowest extent of the net area sown and this does not include the figures for Abujhmar area where survey and demarcation of land have not been properly undertaken and where record of rights does not exist. This is the area where shifting cultivation is still being practised largely.

Out of the total cultivable area estimated above about 87 per cent has been included in land holdings of different sizes. Marginal holdings constitute about one-fourth of the total holdings and about one-sixth fall into the category of small holdings. Semi-medium and medium sized holdings are also about one-fourth each. The large sized holdings account for only one tenth of the total. The tribals have the largest share, as expected, of the holdings. They share about 67 per cent of the marginal, 70 per cent of the small, 72 per cent of the semi-medium, 78 per cent of the medium and 86 per cent of the large sized holdings. The pattern of area distribution under different land holding classes is the same as found elsewhere; the lowest class having more holdings and less area per holding. Marginal holdings constituting about 25 per cent of the total account for only 2.6 per cent of the total area. The share increases as the size of holding becomes larger culminating in the large sized holdings which are only 10 per cent of the total holdings but possess 43 per cent of the total area. On the whole tribal people own about 73 per cent of the total



holdings covering about 80 per cent of the area. This analysis indicates the magnitude of the problem of improving the status of traditional agriculture.

Another feature characteristic for determining the strategy to be adopted for proper approach to the problem is the distribution of these holdings according to various regions of the district. The northern and central parts of the district which are comparatively developed as far as agricultural techniques are concerned possess a higher proportion of smaller holdings. Kanker and Bhanupratappur tehsils in the north share a shade more than one-fifth of the total land holdings in the size group of 0-4 ha. The central part of the district comprising Kondagaon, Narayanpur and Jagdalpur tehsils account for about 56 per cent of land holdings belonging to the above size group. The southern region consisting of Bijapur, Dantewara and Konta tehsils possesses only 23 per cent of the total holdings of the size group 0-4 ha. In the case of land holdings of size group 4-10 ha. the northern part has almost the same share as in 0-4 ha. group but the central part concedes about five percentage points and the south gains the loss of the central region. The share of large sized land holdings of 10 ha. or more comes to 15 per cent in the north, 41 per cent in the central and 44 per cent in the south. The following table gives the comparative position.

Region	Distribution of land holdings by size-group (in percentages)		
	0-4	4-10	10 or more
1	2	3	4
Northern	21.2	20.9	15.0
Central	55.6	50.5	40.8
Southern	23.2	28.6	44.2

The distribution of land holdings in different micro regions of the district highlights the increasing pressure on land in the north and central parts of the district while in the south it is relatively less. The choice is clear; efforts have to be made to augment yield per hectare in the north and central parts of the district through a programme of increasing the area under intensive cultivation methods, such as, the use

of high yielding varieties of seed, chemical fertilizers and better farm management, while in the south emphasis should be on the improved practices of intermediate level such as, proper field preparation, adoption of suitable seed rates, use of organic manure, line and drill sowing techniques, timely watering and weeding operations, etc. In this discussion considerable area of Abujhmar has been left out where rudimentary techniques of cultivation are being practised and will require cautious approach and different treatment.

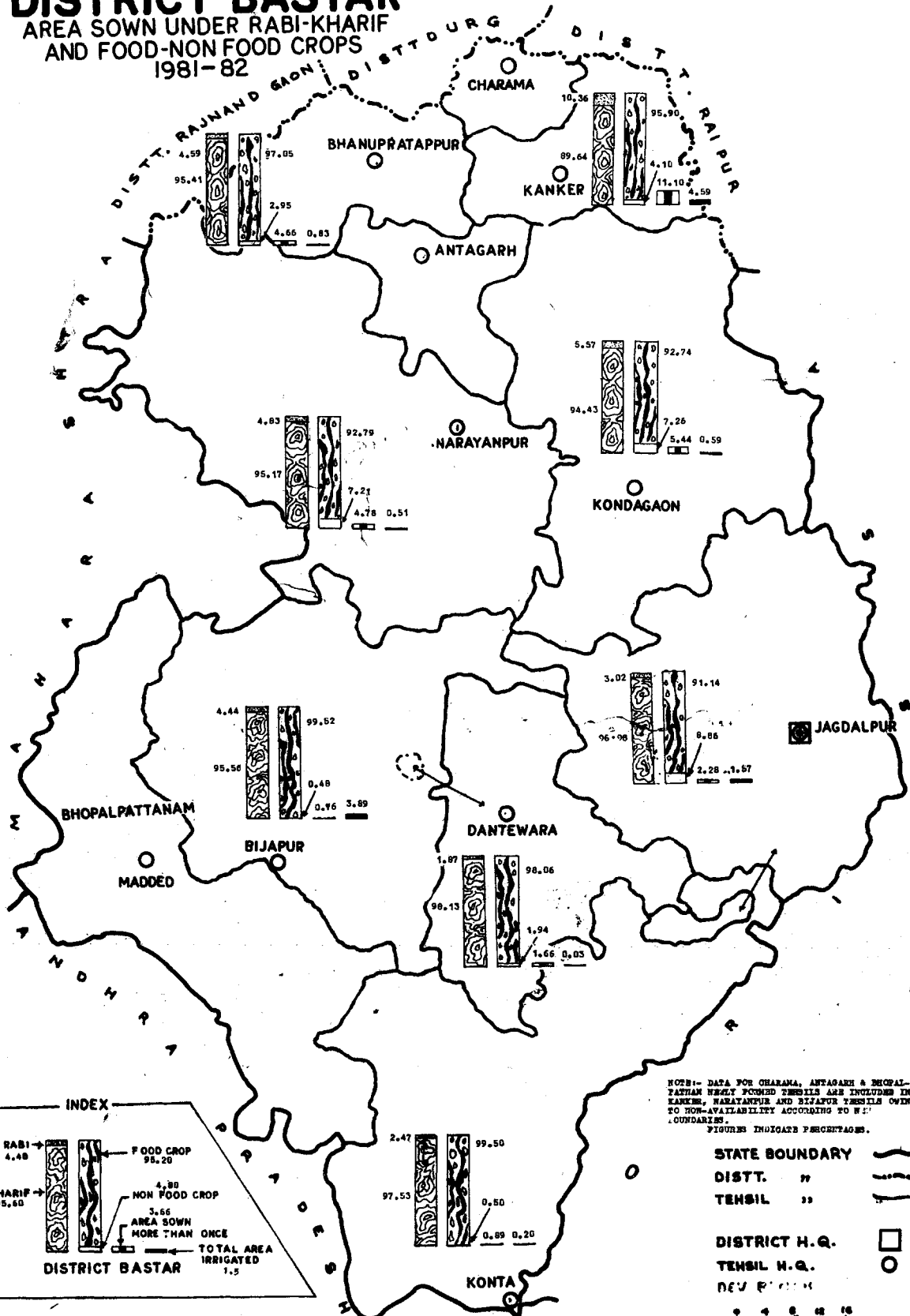
### Cropping Pattern

The cropping pattern of any area is largely a product of the geoclimatic and geophysical factors and the supporting infrastructure available to the people. The crops grown in the district are mainly Kharif and among them food crops are predominant. Rabi crops generally do not find a place in the pattern of life tribals lead. They have become so accustomed to a life of minimum need and maximum freedom that a change to a more disciplined work pattern is hard to be comprehended properly by them in their present state. Nature has also helped them in adopting such a life pattern since it has provided them with rich abundant forest, adequate and well distributed rainfall and a soil fertile enough and responding to meet their low demand. The resultant cropping pattern is predominantly rainfed. Out of the total gross area cultivated in 1981-82 the area under Kharif crops was as high as 95.5 per cent, and Kharif food crops accounted for about 93 per cent. However, total food crops were sown on 95 per cent of the gross cultivated area. Paddy emerges to be the main crop throughout the district. Tehsilwise position based on 1981-82 data is given below :

Region/Tehsil	Area (ha.)	Percentage to total sown area
1	2	3
<u>North</u>		
Bhanupratappur	31278	56.12
Kanker	64545	67.12

Contd.

MADHYA PRADESH  
**DISTRICT BASTAR**  
 AREA SOWN UNDER RABI-KHARIF  
 AND FOOD-NON FOOD CROPS  
 1981-82



NOTE:- DATA FOR CHARAMA, ANTAGARH & BHOPALPATTANAM WERE FORCED TEHSILS ARE EXCLUDED IN KANKER, NARAYANPUR AND BIJAPUR TEHSILS DUE TO NON-AVAILABILITY ACCORDING TO NEW BOUNDARIES.

FIGURES INDICATE PERCENTAGES.

DISTRICT H.Q.

TEHSIL H.Q.

NEW PATTNA

1	2	3
<u>Central</u>		
Narayanpur	48062	58.59
Kondagaon	83138	68.54
Jagdalspur	117392	63.10
<u>South</u>		
Bijapur	59331	82.89
Dantewara	48922	45.74
Konta	70850	60.82

Paddy, although spread over the entire district, is concentrated in the central parts of the district where about 48 per cent of the total paddy area is cropped. The southern region shares 34 per cent and northern region accounts for about 18 per cent. Kodonkutki, is also a common crop taken in all the regions of the district and is the second major crop as far as area is concerned. The major share in its area is of southern region where it is grown over about 48 per cent of the total area. The share of central and northern regions is about 33 and 19 per cent respectively. Maize is concentrated in the central region while jowar is in the southern region. The share of major crops according to different regions is shown below :

(Percentages)

Regions	Paddy	Jowar	Kodon-kutki	Maize	Pulses	Oil-seeds
1	2	3	4	5	6	7
North	18.3	7.4	19.5	6.9	25.6	14.0
Central	47.6	14.0	32.5	61.6	49.9	78.7
South	34.1	78.6	48.0	31.5	24.5	7.3
	100.0	100.0	100.0	100.0	100.0	100.0

Wheat crop has yet to make an impact in the district. The area under wheat was a paltry 3000 ha. constituting less than 1 per cent of the net area sown in 1981-82. The area under pulses was about 6 per cent and it was about 4 per cent under oilseeds. Vegetables and fruits covered less

than 1 per cent area and the area under spices, fibres, sugarcane and tobacco was individually negligible.

Double cropped area in the district was about 4 per cent. This is, however, more in the northern parts of the district. Kanker tehsil in the north had the highest double cropped area (11 per cent). Other tehsils in the north and central parts of the district had 4 to 5 per cent. Bijapur and Konta tehsils in the south had less than 1 per cent while Dantewara had 1.6 per cent double cropped area. The fact is that double cropped area in the district is less but there is implicit indication also that with the growth of public and private irrigation infrastructure in the district people have become aware for intensifying agriculture. This augurs well for future development. Already about one-fourth of the total irrigation potential created from all sources is being utilised and further increase in the use of water is expected.

#### Performance

The soils of the district have yet not been over-worked as is evident from the yield rate of different crops. In the case of some crops the yield per hectare is better than the State average. The average yield for the last three years (1979-80 to 1981-82) of important crops in kilograms per hectare is given below :

Crops	Bastar	State
1	2	3
Paddy	770	662
Kodon-kutki	179	162
Maize	1197	837
Jowar	835	632
Urad(Kharif)	384	216
Kulthi (Kharif)	313	253
Rape & Mustard	367	416

This phenomenon appears to be on account of generally favourable monsoon well spread over the season and the natural fertility of the soil. What people require is the direction, adequate supply of

inputs and availability of essential infrastructure to raise the productivity. Current levels of production under various important crops in the district are as under :

Crop	Production (in 000 tonnes)		
	1979-80	1980-81	1981-82
1	2	3	4
Rice	309.2	391.8	389.3
Wheat	2.4	3.1	3.3
Jowar	8.3	8.1	8.2
Maize	39.4	30.3	29.4
Kodon-kutki	27.4	14.6	22.4
Urad	3.4	3.0	3.3
Kulthi	11.8	11.0	10.8
Rape & Mustard	4.8	5.9	6.9
Niger	3.2	3.0	3.0
Sugarcane (Gur)	0.7	1.8	1.0
Sweet potato	3.9	2.9	3.2

With the adoption of settled cultivation the district which was once practicing completely out-moded and low level technologies for cultivation has gradually changed. The use of wooden and iron ploughs have increased. In 1981-82 there were 2,97,033 wooden and 47,126 iron ploughs in use which combinedly make more than one plough per holding. The number of tractors working in the district was 146. The cultivators created their own source of obtaining water for irrigation with or without government help. In all, in 1981-82, there were 7778 irrigation wells which irrigated about 9 per cent of the total irrigated area in the district. The technique of lifting water to the ground level from wells or perennial flowing nallahs and streams has also changed. The use of power in the form of electricity or diesel has been adopted. There were 899 diesel and 311 electric pumps functioning in various parts of the district. The mode of transporting the produce or other commodities and articles has also improved. People are using bullock carts for this purpose instead of carrying these things in head loads or in balancing buckets. There were 61140 bullock carts in the

district in 1981-82.

During the successive Five Year Plans special efforts have been made by various government agencies to improve the lot of tribals and they have produced encouraging results. Agriculture development programmes in the district have created an atmosphere conducive for bringing change. The cultivators of the area have started thinking about and some of them have actually taken to improved techniques. The Governmental efforts have, through a programme of subsidizing the acquisition of capital assets in the form of improved implements, land development, irrigation sources, etc., created conditions for the change in outlook. So far various measures have been taken in the fields of land development and conserving the soil fertility, such as field bunding, land levelling and terrace bunding. There is need for taking up these measures more vigorously in view of the topography of the area and in the context of increasing irrigation potential. During the last three years (1979-80 to 1981-82) 17,536 ha. have been bunded and 20 ha. have been bench terraced. Apart from creation of reservoirs for arresting the wasteful flow of surface water and making it available for use efforts have also been made to tap groundwater resources. During 1982-83 alone, 228 new irrigation wells were constructed and 30 old wells were restored for use. For utilising the perennially flowing water in rivers and streams, lift irrigation schemes were undertaken and 37 electric pumps and 251 diesel pumps were installed. The efforts to increase the area coverage under high yielding varieties have shown the acceptance of the people and about 220 thousand ha. of cultivated land under paddy, wheat, jowar and maize have been covered by HYV upto 1981-82. The area covered by HYV was largest under paddy, almost 97 per cent of the total area under high yielding varieties. Among rabi crops high yielding variety wheat sown in 2000 ha. out of the total of 3000 ha. under wheat crop. The use of chemical fertilizers has also increased and on the whole is showing increasing trend. In 1979-80 the use of fertilizer was more in Kharif crops but in 1981-82 the use of NPK in Kharif season, has come down and the increase in rabi crops is substantial. The consumption pattern for the last three years is given in the table below :

(tonnes)

Year	Kharif				Rabi			
	N	P	K	Total	N	P	K	Total
1	2	3	4	5	6	7	8	9
1979-80	189	118	27	334	191	75	19	285
1980-81	258	140	36	434	169	70	25	264
1981-82	81	28	11	120	403	187	64	654

The inference from the above data is that the use of NPK during the last three years has gradually increased but overall performance is still unsatisfactory. The consumption of fertilizers was 0.93 kg. per ha. in the district in 1981-82 while the state average was 10.95 kg. per ha. Another important input in modernising agriculture is the easy and timely availability of credit. The general policy is to provide credit for the purchase of essential inputs and acquisition of assets. Short term loans are provided to purchase fertilizers, seeds and keeping in view the poor economic conditions of the tribals a cash component in short term loans is provided to enable them to defray wage expenses on hired labour. Medium term loans are meant for the purchase of cattle, repairs of wells, construction of dry wells, installation of pumps and rehats etc. Long term loans are given to purchase tractors, construction of tubewells, field bunding and acquisition of new electricity connections. The magnitude of loans distributed to tribals during the last four years can be seen from the table below :

(Rs. '000)

Type of loan	Y e a r s			
	1978-79	1979-80	1980-81	1981-82
1	2	3	4	5
Short term	1454	1859	1859	4473
Medium term	122	47	47	173
Long term	1076	1895	2500	3604

It will be observed that loans for the purchase of fertilizers, seeds, construction of tubewells, purchase of pumps, bunding of fields and taking new connections of electricity are on the increase and it shows the direction to which the tribal intends to go.



The department of agriculture has established four agricultural farms in the district for raising quality seed to be distributed/sold among tribals and other farmers of the district. These farms are located at Kondagaon, Kokamunda, Keralapal and Pamalwaya. These farms produced 1553 quintals of seed. There are two more seed production farms, one functioning under the Seed Corporation at Khumrawand and another at Kanke under J.N.A. University. Apart from these agricultural farms a research centre at Khumrawand has been established by JNKVV under the National Agriculture Research Project. The centre has been established with the objective of providing a scientific base for the formulation of future agricultural development programmes. The centre will undertake research for identifying agroclimatic subregions; demarcation of water sheds and sub catchments for developing appropriate soil and water management technology; determining the potential and suitability of mixed farming; developing suitable management practices for the varieties of major and minor crops grown in the district; improving the breed of livestock and developing management patterns suitable for the area, evolving quick growing species of trees with focus on forage species for providing better nutrition to animals and providing training facilities and proper linkages for development functionaries. The centre has yet to become fully operational.

## II. Approach and Strategy

The detraditionalisation process among the tribals of Bastar has started and has taken a positive shape in the field of agriculture as is evident from the foregoing situational analysis. However, technological levels obtaining in the district alongwith sociocultural and structural resistance will define the extent to which exogenous push can be applied. The situation will differ from one microregion to another both on account of the people involved and physical parameters. Yet, augmented production will bring in its wake a few problems of management for sustaining as well as expanding the area of growth. These problems are to be properly understood and their solutions programmed in advance. These will relate to :

1. Efficient management of timely supply of inputs like HYV seed, adequate quantity of fertilizers and water availability for

irrigation;

2. expansion of the area under improved practices and protective cover of insecticides and pesticides.
3. easy and adequate availability of credit to the farmers for creating commensurate infrastructure for improved practices such as purchase of pumps, electricity power, improved implements and equipments etc.
4. provision of agriculture service centres to serve even far away places in the interior.
5. mopping up of surplus marketable produce from the farmers, and
6. providing market price to the cultivator at the farmsite or at the nearest mandi or collection centre.

The cultivators have to be assured that they will get the necessary seed timely and in adequate quantity at a fair price. Keeping in view the vastness of the district with extremely poor communication linkages it will not be profitable to have a longer lead for the supply of seed to the cultivators. The supply can be ensured either through a contractual arrangement with a leading grower of the area or cooperatives at the lowest levels. In the latter case management problems would be several and failure of any link in the chain would adversely affect the whole programme as well as the fragile confidence of the poor tribal. The grower, on the other hand would be on the spot for the timely supply but he can also become an exploiter. The solution lies in making the grower give seed to the cultivators of his area on barter basis in which the cultivator will pay back the original quantity of seed plus a quarter more. In the initial stage the grower-cum-distributor cultivator will be given HYV seed and other associated inputs on nominal cost with a guarantee that the produce, if not transferred to the cultivators will be purchased by the government.

The seed production programme at the farm of the contracted grower will be technically controlled and supervised by departmental agency. It will ensure optimum results in the raising of seeds and the training of the grower cultivator., With a view to transfer the knowledge

and compact production technology as well as a proper distribution of first generation seeds to other farmers it is considered feasible to organise small farmers in small production oriented groups so that they may participate fully in learning the techniques and may absorb the cost impact considerably. The grower cultivator will give first generation seeds to these groups of cultivators.

The distribution and sale of chemical fertilizers will be organized through cooperatives which are proposed to be established at every hat centre in the district. Agroservice centres are to be established where a demand exists for utilising the services of such centres. Essential mechanical and electrical repair services should be provided by planting lower order mechanics at important hat or identified growth centres with an area coverage of about ten kilometers. Efforts should also be made to train the local youth or the cultivator himself in simple repair work and service techniques with a view to eliminating the chances of nonavailability of mechanics at the time of need.

Credit is one of the most crucial elements of modern agriculture and more so in poor tribal areas. The costs of adopting modern techniques are high and beyond the reach of ordinary cultivators. This is one of the main reasons for low operational profile of modern inputs in backward areas. A network of cooperatives for assessing the credit needs and organising credit availability shall have to be established. In the mean time departmental agencies will coordinate various credit needs of the people and get them credit and subsidy from appropriate agencies. However, the objective is to establish a system wherein the cultivator could of his own approach the credit agency, as he is doing with the local money lender, and get the necessary help. The other objective is to make the loan sanctioning process least cumbersome and within intellectual grasp of the tribal. Agriculture extension service will look after the credit interests of the cultivators and will continue to educate them in matters of procedure and approach. Presently, input supplies are free or at a high subsidised rates and therefore credit requirements are limited but with the growth of agricultural output and technological needs of the cultivators, credit is going to assume a very significant role in

the whole strategy of crop production. It is in this context that credit institutions should be multiplied and located at least at large hat centres.

The district is backward in road linkages and it will take considerable time to spread a net work of roads connecting the villages with market centres. Agriculture development programme in the meantime, is expected to raise food grain and other crop production in the district. Higher crop productions without proper outlet linkages to market centres will affect the price structure to the detriment of the cultivator. In the initial stages of agricultural development market prices play a crucial role in enthusing the farmers for allocating their resources. The prices, thus, act as an anchorage in both pre and post development stages. Any programme aiming at bringing more area under cultivation as well as increasing productivity per unit of area must be backed by a price structure capable of giving economic returns to the producer. In case of tribal areas where satisfaction levels are very low and aspirations limited high financial returns can only spur people to adopt new technology for raising production and productivity. The adoption of new technology entails costs to the farmer which the tribals are not in a position to meet. The system of providing input subsidy can be extended to mitigate the cost impact of new technology. The system, however, should be operated cautiously since it tends to get structured in the system although it is a short term measure. The system can be made result oriented when the produce so augmented can fetch competitive market price. In a tribal economy subsidising inputs can function well when the tribals get access to a competitive market and acquire competence to hold back the supplies to a more opportune time. In absence of such a condition subsidies may turn simply as costs which the society should pay for the backwardness of the tribals and thus not only the system will create new dependencies but will also sever its link with the production process. In such a situation some sort of price parity with some established regulated market shall have to be artificially created in order to provide the tribals with encouraging returns on their efforts and investments. Given the fact that tribals will have to be provided with a package of technologies for increasing their production and in the initial stages the costs shall have to be neutralised by providing subsidies whether in cash or kind, a detailed exist

mechanism for the produce shall have to be worked out with a view to (i) providing reasonable price (ii) extricating them from the clutches of local kochias and (iii) ensuring that the increased production brings the benefit to the tribals and not to the middle man. Therefore, a post harvesting subsidy assumes significance. The subsidy however, may not be given to the cultivator but to the agency purchasing the produce. The system would be to purchase the surplus produce by the cooperative at a price ruling at Raipur regulated market minus the transport cost from predetermined centres in the district and these cooperatives in turn be provided with adequate transport costs in the form of subsidy.

### III. Plan Proposals

Agriculture development conveys a systematised effort of raising crop production by bringing structural changes in the pattern of cultivation, application of research in terms of high yielding technologies including crop protection measures, augment irrigation facilities and improved delivery system of inputs like seed, fertilizers, credit and equipment. Efforts in all these directions have been made in the district but they remain insufficient and have only been able to create a modicum of consciousness amongst farmers. The general level of development in agriculture sector has not improved. The methods of cultivation prevailing in the district are still old and traditional in a majority of cases. Even such agricultural practices as line sowing and intercultural operations, manuring, application of fertilizers and pesticides have not been adopted on a large scale. Irrigation percentage is low in relation to the total area under cultivation. Intensive cultivation as a concept has not yet caught the imagination of the tribal cultivator, may be, on account of cultural factors. Cropping pattern has not changed and wherever there is any change it has not come in favour of nonfood crops both edible and non edible. Rabi crops are only marginal. The tribal is not forthcoming in a big way in accepting the new and scientific methods of cultivation since there is still distrust for anything which is not local and which has not been adopted by the community or in which he has to depend upon strangers, both technocrats and bureaucrats.

The heartening feature nonetheless is the dissolution of the tribal resistance to a considerable degree. The long experience of exploitation will take some time to be erased from the tribal's mind and it will take some doing on the part of development functionaries to restore the atmosphere of trust. In certain areas tribal farmers have shown keenness in getting and adopting modern equipment of farming. They appear convinced about the efficacy of high yielding varieties but are not sure regarding the timely availability of associated inputs. In the northern parts of the district a wide spectrum of change has taken place but the crucial tribal population is concentrated in the west, south west, south central and southern parts of the district. It is in these areas that a break through has to be achieved through a gradual process of breaking the resistance of the tribal by means of demonstration of the efficacy of new methods and generating confidence by improving the delivery mechanism. The plan aiming at the economic welfare of the tribals will necessarily have to be sectorally integrated and largely innovative seeking to improve existing methods and resources. Within these parameters a set of guidelines for agriculture development in the district have been framed. These are :

- (a) to bring improvement in the soil and water management techniques through conservation of soil resources, land levelling, field bunding etc.
- (b) to bring improvement in the use of created irrigation potential through a programme of construction of water channels to the fields; utilising water resource by taking up diversion and lift irrigation schemes and by training farmers in water use and management techniques;
- (c) to take up screening of local varieties of seeds for improvement and developing new varieties of Kodon kutki and Kulthi which are commonly grown in the area;
- (d) to develop area under pulses, oil seeds and root crops;
- (e) to popularise HYV and fertilizers through miniket distribution programmes and subsidising costs;

- (f) to transfer knowledge and to create new confidence levels through demonstration of the techniques of cultivation and management of pulses, oil seeds and HYV food crops;
- (g) to introduce horticultural programmes for meeting dietary needs and for establishing processing units;
- (h) to arrange training programmes and study tours for tribal farmers and
- (i) to strengthen and establish marketing organisations for the purchase of the produce at proper prices.

In accordance with the above guidelines, the following schemes have been proposed for the Seventh Plan, which together will involve an outlay of Rs. 2296.45 lakh and are likely to raise the current production.

#### **Soil and Water Conservation**

The benefits of soil and water conservation measures have been very well understood by the farmers and there is quite a significant demand for taking up programmes for land levelling and bunding. The infrastructure for carrying out these programmes exists at Jagdalpur, Kanker, Dantewara and Kondagaon. The following schemes are proposed to be included in the Seventh Plan which will involve an outlay of Rs. 1112.50 lakh.

#### **Munda Diversion**

The construction of Munda Diversions for stopping the flows of nallas and rivulets so that the water could be diverted to irrigate the rice fields is proposed to cover 30,000 ha. during the plan period. It is proposed to subsidise the cost to the extent of 75 per cent and the rest be taken from the cultivators. Accordingly a provision of Rs.675.00 lakh is proposed for the Seventh Five Year Plan.

#### **Construction of Micro-Minor Irrigation Tanks**

Tank irrigation is being practised by the tribals of the district. In 1981-82 an area of 6.5 thousand ha. was irrigated by tanks. Such tanks are fed from smaller catchments in the area. They serve dual

purpose of irrigating the fields and of recharging irrigation wells in nearby area. The area commanded by such tanks is generally upto 40 ha. It is proposed to construct 50 tanks during the Seventh Plan. It will involve an expenditure of Rs. 250.00 lakh.

#### Land Levelling Works

The district is predominantly a rice growing area. Paddy fields need to be levelled for the proper growth of the crop. Since the topography of the district is undulating, this programme becomes important for the district. The scheme is proposed to be executed in 50,000 ha. involving a total expenditure of Rs. 200.00 lakh. It is proposed to subsidise the cost to the extent of 75 per cent. A provision of Rs. 150.00 lakh has been proposed in the Seventh Plan for this purpose.

#### Construction of Water Courses

The water has to be led from the minors to the fields for irrigation. It is proposed to construct water courses to irrigate 5,000 ha. which will involve an expenditure of Rs. 50.00 lakh. A subsidy to the extent of 75 per cent is proposed to be given and thus a provision of Rs. 37.50 lakh has been included in the Plan proposals.

The total outlay required for the Plan period under soil and water conservation will be as under :

Scheme	Targetted Area/No.	Total estimated expenditure (Rs.lakh)	Subsidy (Rs.lakh)
1	2	3	4
1. Munda Diversion(ha.)	30,000	900.00	675.00
2. Construction of Micro-Minor Irrigation Tanks	50	250.00	150.00
3. Land Levelling Works (ha.)	50,000	200.00	250.00
4. Construction of Water Courses(ha.)	5,000	50.00	37.50



### **Minor Irrigation Schemes for Tribals**

The irrigated area in the district is about 1.5 per cent of the net sown area and the crop intensity is about 104. Irrigation potential to the extent of about 10 per cent of the net area sown would be created by the end of the Sixth Five Year Plan. The distribution of this potential is expected to be equitable as far as development blocks are concerned but quite a large area would be left out of the command of the potential in each block. With a view to providing irrigation facilities to such areas and to creating a proper base for the propagation and use of HYV and fertilizers it becomes imperative to take up minor irrigation schemes. It is also felt necessary to provide cultivators with power driven equipment for utilising the flowing water by lifting it and use for irrigation by gravity flow. The following schemes meant exclusively for tribals are proposed to be included under this head which will involve an outlay of Rs. 421.50 lakh.

#### **Construction of New Wells**

Construction of 3000 new irrigation wells is proposed to be taken up during the Plan period 1985-90. The ground water resources available are of considerable magnitude of which current annual draft for all purposes does not exceed 1.4 per cent. Thus, there is good scope for expanding this source of irrigation. The cost estimates for the construction of these wells are Rs. 300.00 lakh. It is proposed to subsidise the cost to the extent of 75 per cent and as such a provision of Rs. 225.00 lakh is proposed for the Seventh Plan.

#### **Repairs of Old Wells**

There are about 7778 irrigation wells in the district which are in use but many of them have become old and are in delapidated condition. As such their performance has gone down. It is proposed to repair 2000 old wells during the Plan period. The cultivator will be required to invest 25 per cent of the total cost and the rest will be borne by the Government as subsidy to the cultivator. The total cost on repairs is estimated to be Rs. 80.00 lakh and as such a provision of Rs. 60.00 lakh is proposed for the Seventh Plan.

### Installation of Electric Pumps

Electricity is available in 634 villages in the district and by the end of Sixth Five Year Plan it is expected that 216 additional villages will be electrified. The use of electricity for irrigation purposes is being made and there are 311 electric pumps in operation. With a view to utilising the available power supply in the district and also to prepare ground for the consumption of electricity to be made available by the end of Sixth Five Year Plan and during the Seventh Five Year Plan it is proposed to install 1850 electric pumps in the district which will involve an expenditure of Rs. 74.00 lakh. The tribals are to be encouraged to make increasing use of electricity in the field of agriculture and with this end in view it is proposed to provide a subsidy to the extent of 75 per cent for meeting the cost of installation of electric pumps. Accordingly a provision of Rs. 55.50 lakh is proposed for the Seventh Plan.

### Installation of Diesel Pumps

In addition to the programme of installing electric pumps, it is proposed to continue the scheme of providing diesel pumps to the cultivators in villages where there is no electricity or to supplement the power supply where there is electricity. There are about 899 diesel pumps in operation and it is proposed to install 1800 diesel pumps during the Seventh Plan period. The cultivator will be given subsidy to the extent of 75 per cent to meet the cost of installation of these pumps. The total cost is estimated to be Rs. 108.00 lakh and accordingly a provision of Rs.81.00 lakh is proposed for the Seventh Plan.

The total outlay required for the Plan period under this head will be as under :

Scheme	Target (Number)	Total estimated expenditure (Rs. lakh)	Subsidy provision in the Plan (Rs. lakh)
1	2	3	4
1. Construction of new wells	3000	300.00	225.00
2. Repairs of old wells	2000	80.00	60.00
3. Installation of electric pumps	1850	74.00	55.50

Contd.

1	2	3	4
4. Installation of Diesel pumps	1800	108.00	81.00
			<u>421.50</u>

#### Crop Production Programme

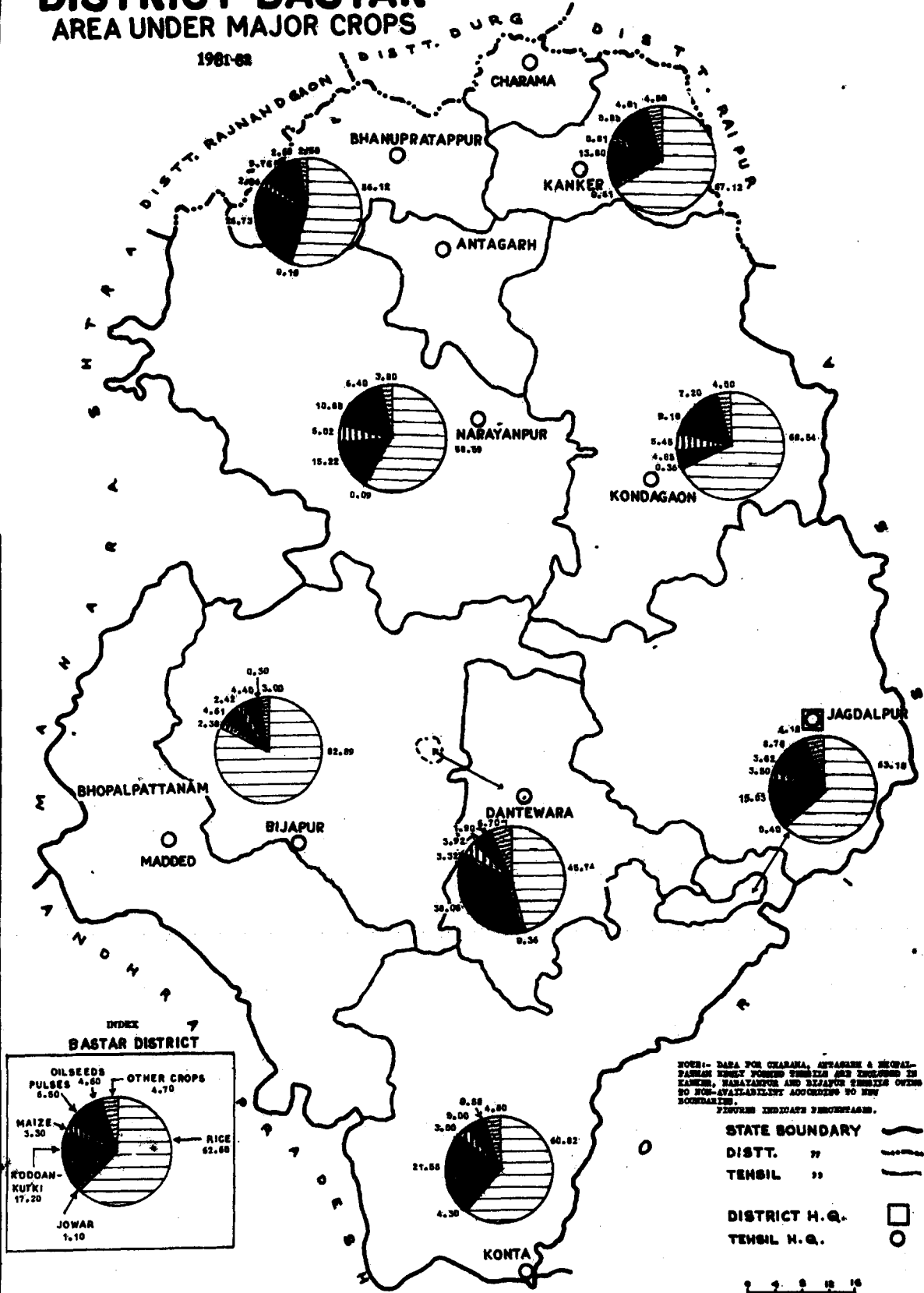
Keeping in view the existing cropping pattern, diversification for future needs and the development of irrigation potential, the following crops have been selected for special emphasis during the Plan period. The present position of these crops and the targets set for the Plan are given below :

Crop	Present level			Targets for VII Plan		
	Total area ('000 ha.)	Production ('000 MT)	Productivity (kg/ha.)	Total area ('000 ha.)	Production ('000 MT)	Production (kg./ha.)
1	2	3	4	5	6	7
Paddy	523.5	543.9	905	545.0	560.0	1050
Maize	27.9	29.4	1054	36.0	38.0	1350
Juar	9.0	8.2	877	13.5	10.0	965
Urad	8.9	3.3	204	12.0	4.3	355
Kulthi	35.6	10.8	265	41.0	15.0	330
Wheat	3.0	3.3	1140	8.5	8.6	1000
Gram	2.1	0.9	422	6.0	2.5	422
Soyabean	-	-	-	8.0	4.8	600

Tribal farmers in command areas will be encouraged for adopting the modern agricultural practices and 8,800 farmers will be selected for intensive training for 2 years. They will be persuaded to sow HYV seed of rice crop in one ha. of their own land, under the guidance and supervision of experts. The farmers will be given subsidy on the unit cost of Rs. 1350.00 for meeting the cost of seed and fertilizers etc. at the rate of 75 per cent for the first year and 50 per cent for the second year. In rainfed areas, the number of farmers to be selected will be

# MADHYA PRADESH DISTRICT BASTAR AREA UNDER MAJOR CROPS

1981-82



5,000 for the first year and 11,000, including 5,000 of the previous year for the second year. These farmers will be persuaded to sow different crops in one ha. on their fields under the guidance and supervision of the experts. The subsidy on the unit cost of Rs. 500.00 per ha. will be 75 per cent. The working of this scheme will be reviewed after 2 years and will be modified according to the experience gained during the period. The scheme will require an outlay of Rs.417.00 lakh out of which Rs. 208.50 lakh will be spent in the first 2 years and Rs.208.50 lakh will be utilised in the remaining 3 years of the Plan. The details of the proposed expenditure during the first 2 years are given below :

Crop	No. of selected farmers		Amount of subsidy to be given (Rs. in lakh)
	Command area (in ha.)	Rainfed area (in ha.)	
1	2	3	4
Rice	16000	6000	157.50
Maize		2000	7.50
Juar		2000	7.50
Urad		500	1.87
Soyabean		3000	11.25
Kulthi		2000	7.50
Wheat	1600	250	14.44
Gram		250	0.94
	<u>17600</u>	<u>16000</u>	<u>208.50</u>

The pattern of expenditure for the next three years would be determined after the review of the working of the scheme.

#### Minikit Programme

In order to assure the tribal farmer regarding the efficacy and suitability of new varieties, minikits containing small quantities of seeds and fertilizers are proposed to be distributed free of cost among farmers. This scheme is being carried out presently also with encouraging results. Farmers are allowed to adopt their own package of practices. The scheme is likely to involve an outlay of Rs. 18.60 lakh as per

details given below :

Crop	Size of Minikit (kgs.)	No. of Minikits	Total cost (in lakh Rs.)
1	2	3	4
Rice	2.00	1,52,000	9.12
Wheat	5.00	4,900	0.98
Gram	3.00	5,100	0.61
Arhar	2.00	4,000	0.60
Urad	2.00	9,000	0.72
Soyabean	8.00	14,200	4.55
Groundnut	10.00	1,650	1.32
Sesamum	1.00	1,600	0.10
Ramtil	2.00	2,150	0.13
Linseed	2.00	2,100	0.21
Rape/Mustard	1.00	4,400	0.26
		<u>2,01,100</u>	<u>18.60</u>

#### Supply of Agricultural Implements

Broadcasting method of sowing seeds is generally adopted in most of the district. Improved method is, however line sowing which requires at least bullock driven seed drills. Improved implements are also required for other improved agricultural practices. It is necessary therefore, to make available improved implements to the tribals. Keeping this in view and to popularise the use of improved implements in the area a scheme for supplying agricultural implements at subsidised rates is proposed. It is also proposed to apply different subsidy rates according to the size of holdings. The cultivators having holdings of more than 4 ha. will be given subsidy to the extent of 75 per cent of the costs of implements but those cultivators who possess holding of less than 4 ha. will have the benefit of cent per cent subsidy. The scheme will involve an expenditure of Rs. 39.60 lakh, the details of which are given below :

Implements	No.	(Rs. in lakh)
1	2	3
1. For farmers having holdings of more than 4 ha.		
(a) Seed Drill (Mahakal Type)	3600	8.10
(b) Datari, Seed Drill	3350	6.28
(c) Weeders	3200	2.87
(d) Improved harvesting sickles	6100	0.75
2. For farmers having holdings of less than 4 ha.		
(a) Kits of improved implements	5400	21.60
	Total :	<u>39.60</u>

### Farmers Training Centre

Farmers training centres have been established at different places in the State with a view to impart latest scientific techniques in cultivation and crop management to the farmers. These centres arrange training programme of 5 days, 3 days and one day duration through out the year for farmers, rural youth and rural women. The training course covers a package of practices for different crops, effective use of irrigation water, land management, horticulture, kitchen gardening, bio-gas, the use of improved agricultural implements and plant protection measures. Women, in addition, are trained in house management, child care, balanced diet, small savings and preparation of products from indigenous fruits and vegetables. It is proposed to establish a Farmers Training Centre in the district at Kondagaon for the benefit of the district. The centre will have the following staffing pattern.

<u>Category of Staff</u>	<u>Number</u>
Principal	1
Farm Radio Officer	1
Training Officers	3
Lady Instructor	1
Office Clerk	1
Chowkidar, Peon and Driver	3

The scheme will involve an outlay of Rs. 45.00 lakh details of which are as under :

	<u>Rs. lakh</u>
Buildings for office, lecture hall, library, hostel and staff quarters	18.00
Equipment	6.20
Vehicles (Bus and Jeep)	2.90
Establishment expenditure, contingencies, study tours and allowances to farmers	17.90
	<u>45.00</u>

#### **Gram Sewak Training Centre**

Because of inadequacy of modern facilities in rural areas of Bastar, government officials from outside the districts do not generally stay at the place of their posting in interior areas. This is particularly true in case of Gramsevaks (Rural Agriculture Extension Officers). The Gramsevak is an important link in the agricultural extension services and his close association with the farmers is crucial for strengthening the base of agriculture development in the district. It is, therefore, necessary that tribal youngmen of Bastar be given preference for the job of Gramsevak and they may be trained in the district. Keeping these facts in view, it is proposed to establish a Gramsevak Training Centre at Kondagaon which will train 100 Gramsevaks annually. At present there are 474 sanctioned posts of Gramsevaks.



When all the Gramsevaks have been trained, the Centre will start refresher courses for them. The Centre may also cater to the needs of adjoining districts in future.

The establishment of the Centre will involve an outlay of Rs. 50.00 lakh out of which Rs. 35.00 lakh will be nonrecurring expenditure on buildings hostel, furniture, equipment etc. and the rest Rs. 15.00 lakh will cover recurring expenditure on establishment, stipends and study tours.

#### **Minikits for Oil Seed**

This programme is intended to popularise new strains of oilseeds. The varieties of oil seeds are proposed annually by the Directorate of Oil Seeds, Government of India. A lump sum of Rs. 30,000.00 will be allocated to each block every year. The number of kits containing seed and fertilizer will be determined by the cost of seed and fertilizer but the total expenditure will be restricted to the allocated amount. The scheme will involve an outlay of Rs. 48.00 lakh during the Plan period.

#### **Community Nursery of Paddy**

Under this programme the farmers having irrigation facilities are selected for raising paddy nurseries of high yielding varieties recommended by research institutions. The seedlings thus raised, could be sown in 8 to 10 times the area of the nursery. The seedlings are sold to neighbouring farmers and thus HYV are popularised. The farmers raising such nurseries are given Rs. 1,000.00 per ha. as assistance to meet the cost of seed, fertilizers and pesticides etc. This programme was initiated in 1980-81 and has become popular with the farmers. It is proposed to continue the scheme. The scheme will involve an outlay of Rs. 29.00 lakh during the Plan period.

#### **Plant Protection Schemes**

The introduction of HYV has necessitated the plant protection measures to be undertaken by the farmers. Keeping in view the economic conditions of farmers as well as with a view to popularise the equipment a scheme for supplying the equipment on subsidised basis has been included in the Plan.

It is proposed to supply to farmers 3,000 sprayers and 500 dusters. These equipments will be subsidised to the extent of 50 per cent of the cost or Rs. 250.00 whichever is less. The scheme will involve an expenditure of Rs. 8.75 lakh.

### Crop Competitions

It is a new programme to be introduced in the district. It could not be introduced earlier owing to the paucity of funds. The programme will create a spirit of healthy competition among farmers and will encourage them to grow more. While it will help in popularising the latest techniques of cultivation, it will also provide as a feedback regarding the nature and extent of production problems in different climatic zones. These competitions will be held for important crops, at village, block and district levels. The farmers achieving higher standards of performance will be awarded prizes. The scheme will require an outlay of Rs. 3.40 lakh. The details are as under :

Competitions	No.	Total outlay (Rs. lakh)
1	2	3
District level	13	0.20
Block level	160	0.80
Village level	1600	2.40
		<u>3.40</u>

### Bio-gas Programme

With the depletion of forest around the villages an acute shortage of fire wood is being experienced by the villagers. Any other form of cooking energy is also not available. Bio-gas offers an alternative to solve this problem and the technology involved is simple and effective. The adoption of bio-gas technology for producing energy for domestic use will make the villagers self reliant and the pressure on forests will also be reduced. Keeping this aspect in view, it is proposed to install 135 Bio-gas Plants of 3 cum. capacity and 65 of 4 cum. capacity. The total

outlay required will be Rs. 9.70 lakh. The subsidy proposed for the tribals is cent per cent.

#### **Farmers Training Camps**

With a view to quicken the process of transfer of technology, one-day training camps, for farmers will be arranged at agricultural farms, the farms of progressive farmers and in selected villages as may be convenient from the point of view of organisation for imparting practical training in the package of agricultural practices including plant protection measures etc. These camps will be organised during the cropping season and 1,47,500 cultivators will be trained during the Plan period. Each cultivator will be given incentive money of Rs. 10.00 per day, to cover his incidental expenses. The scheme will require an outlay of Rs. 14.75 lakh.

#### **Interzonal Tours for Farmers**

The past experience has shown that visits of farmers of one zone to another is not only a most rewarding experience for them, but it also remains one of the most effective method of agricultural extension. The farmers are easily convinced of the efficacy of new practices that are being carried out successfully in other areas and they are encouraged to adopt new technologies and practices themselves. Keeping these aspects in view, a programme of Inter Zonal Tour of Farmers has been included in the Plan which will involve an outlay of Rs. 3.20 lakh. The expenditure will cover lodging, boarding and travel expenses of farmers.

#### **Agricultural Exhibition and Fairs**

The tribals have a tradition of hats and fairs and most of the innovations in their way of life are the results of their active participation in these hats and fairs. Agricultural exhibitions and fairs if held at appropriate places can certainly attract a large number of tribals and thus they can be exposed to new knowledge and techniques through a variety of mediums such as demonstrations, models, visual aids, film shows etc. In addition, these fairs and exhibitions can provide an opportunity to the farmers for exchanging notes among themselves and learn from each others experiences. It is with this view that a scheme of agricultural exhibitions and fairs has been included in the Plan. It will involve an estimated

expenditure of Rs. 2.60 lakh during the Plan.

#### **Adoptive Research Programme**

The suitability of new varieties of seeds in areas having different agro-climatic conditions is to be ascertained. For this purpose, adoptive research trials are conducted by the Research and Extension Staff on the fields of the farmers. These trials help in the creation of a self generating seed multiplication programme of suitable varieties. The programme is new for this district but it is bound to yield good results with the setting up of a research station at Jagdalpur under the National Agricultural Research Programme. One trial involves an expenditure of Rs. 400.00 for meeting the cost of fertilizers and pesticides etc. The scheme included in the Plan will require an outlay of Rs.10.00 lakh.

#### **Construction of Residential Buildings**

A new staffing pattern for the district was sanctioned in 1981-82 under Intensive Agriculture and Research Project. The availability of office and residential accommodation is an acute problem in the district. To overcome this problem, the following proposals for construction of office and residential accommodation are given. These proposals will require an outlay of Rs. 62.85 lakh.

	<u>Rs. lakh</u>
Additional Director Office & Residence	5.00
Joint Director Office & Residence	6.18
Dy. Director (2) Office & Residence	8.24
Supporting Staff	
(a) Assistant Director (10) Residence	11.70
(b) Technical Assistants (11) Residence	9.35
(c) Other Staff (36) Residence	22.38
	<u>62.85</u>

To sum up, the schematic programme for agricultural development during the Seventh Five Year Plan is summarized below alongwith their financial requirements classified according to recurring and non-recurring nature of the expenditure :

Scheme	Proposed allocation (Rs. in lakh)
	<u>Recurring</u>
Soil & Water Conservation	1023.50
Minor Irrigation	421.50
Crop Production Programmes	417.00
Minikit Programme	18.60
Agri. Implements	39.60
Farmers Training Centre	18.80
Gram Sewak Training Centre	15.00
Minikits Fertilizer & Oil Seeds	48.00
Community Nursery of Paddy	29.00
Plant Protection Scheme	8.75
Crop Competition	3.40
Bio-gas Programme	9.70
Training Camp for Farmers	14.75
Interzonal Tours for Farmers	3.20
Agri. Exhibition and Fares	2.60
Adoptive Research by JNKVV	10.00
	Total : <u>2083.40</u>
	<u>Non-recurring</u>
Soil Conservation	89.00
Farmers Training Centre	26.20
Gram Sewak Training Centre	35.00
Civil Works	62.85
	Total : <u>213.05</u>
	GRAND TOTAL : 2296.45 lakh 22.96 crore

There is no proposal to augment the existing administrative, supervisory and field personnel for implementing the schematic programmes proposed for the Seventh Plan. The revised departmental set up for the district was sanctioned in 1981-82 and it is proposed to carry out the

programme with the same staff. The existing set up is as follows :

Administrative

Additional Director	1
Joint Director	1
Deputy Directors	4
	<u>6</u>

Supervisory

Asstt. Soil Conservation Officer	1
Sub-Divisional Agriculture Officer	7
Subject Matter Specialist (district level)	8
Subject Matter Specialist (Sub-Div. level)	21
Senior Agriculture Development Officer	39
Agriculture Development Officer	64
	<u>140</u>

Field Personnel

Rural Agriculture Extension Officer	474
Surveyor	84
	<u>558</u>

However, additional staff is being proposed for the two Training Centres to be established at Kondagaon during the Seventh Plan. These Training Centres are (1) the Farmers Training Centre and (2) Gram Sewak Training Centre. The staff proposed for these centres is given below :

Administrative

Principal	2
Farm Radio Officer	1
Farm Manager (specialist)	1
	<u>4</u>

Teaching Staff

Training Officer (Female)	1
Training Officer (Male)	1
Instructors	3
Instructor Veterinary	1
Co-operative Instructor	1
Senior Agriculture Development Officer	5
Social Educational Organiser	1
Demonstrators (Female)	1
Demonstrator (Male)	1
	<u>15</u>

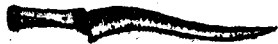
Field Personnel

Rural Agriculture Development Officer	<u>2</u>
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Others

including ministerial, mechanical, carpenter, chowkidar etc.	16
	<u>16</u>

Agricultural Development Programme as outlined above will involve an expenditure of Rs. 22.96 crore out of which Rs. 20.83 crore will be recurring and 2.13 crore will be non-recurring expenditure over the entire Plan period.



## **HORTICULTURE**

### **1. General Review**

Proper development of Horticulture could provide a break through for economic growth in Bastar district, but it has not received its due importance in the spatial planning of the area so far. There is immense scope for improvement of horticultural crops and introduction of new varieties of trees and plants under fruits, vegetables and other commercial crops. Bastar is hilly and sparsely populated and the tribals are accustomed to an economy dependent upon forests and naturally grown fruit trees. The growing of tree crops and their harvesting will admirably suit their genius. Horticultural development could be completely beneficiary oriented and will not only help in improving the economic conditions of the tribals but will also contribute to a very great extent in restoring the ecological balance in the area.

Horticultural activities, in the past, were only adjuncts to the overall development strategy of agriculture and probably for this reason they were assigned a subordinate and much too small a part in the development scheme of the region. The considerations of total performance of the sector limited the role of horticultural activities and they were merely adaptive spatial schemes without developmental perspectives. Now that a separate Directorate of Horticulture has been established, developmental spatial planning should be given preference over adhocism in approach. Horticulture holds the key for the development of the region particularly in view of the fact that agricultural expansion will remain limited to the extent of available culturable land which is estimated to be about 27 per cent of the total geographical area of the district.

Developmental spatial planning, unlike adaptive planning, aims at the positive and more ambitious task of promoting long term economic development through a deliberate spatial reorganisation with a view to minimising the under-utilisation and malutilisation of ecofactors operating in the area. The formulation of a result oriented development perspective is dependent on the proper identification and estimation of potential



ecofactors and devising a strategy for their utilisation which alongwith exploitation may retain and sustain the ecological balance of the area. In the context of horticultural planning the major factor is water availability, the receptivity amongst the tribals and a proper support from climatic and soil factors.

The district receives adequate rainfall during the rainy season. According to an estimate of 90 per cent dependability of rainfall worked out by Irrigation department different areas of the district can be ranged between a minimum of 915 mm and a maximum of 1123 mm. However, concentration of rainfall is between June to September wherein more than eighty per cent of the rainy days occur. This distribution indicates that water availability during winter and summer seasons shall have to be from storage or groundwater reserves. During the rainy season soil moisture is sufficient to raise Kharif crops and so also plants but in winter and summer months soil moisture is reduced. It appears to be the reason for the area to remain as a monocrop zone. This circumstance however is in favour of the introduction of tree crops since trees can draw upon water available in the depth. Tree growing on a large scale would both check the run off velocity and thereby soil erosion and at the same time would help in keeping the water table high in the area. The quantum of rainfall and its concentration from June to September assumes significance in relation to a horticultural plan since it will be in this context that identification of species to be introduced in the area shall have to be made. It will also be necessary to conduct some research to find out such species which may mature with the rains and may not need artificial irrigation. Irrigation potential to be created upto the end of Sixth Plan would hardly be sufficient to cover ten per cent of the cultivated area and this facility can only be utilised for horticultural development in command areas. In areas where arrangements to arrest surface water have not yet been made dependence on groundwater reserves is the only answer. The inference from the above analysis is that horticulture may be taken up as part of inter-cultural practices alongwith agriculture in areas where irrigation potential has been created and in rest of the areas other sources of irrigation may be utilised such as wells and perennial flowing nallahs and streams or even stop dam diversion

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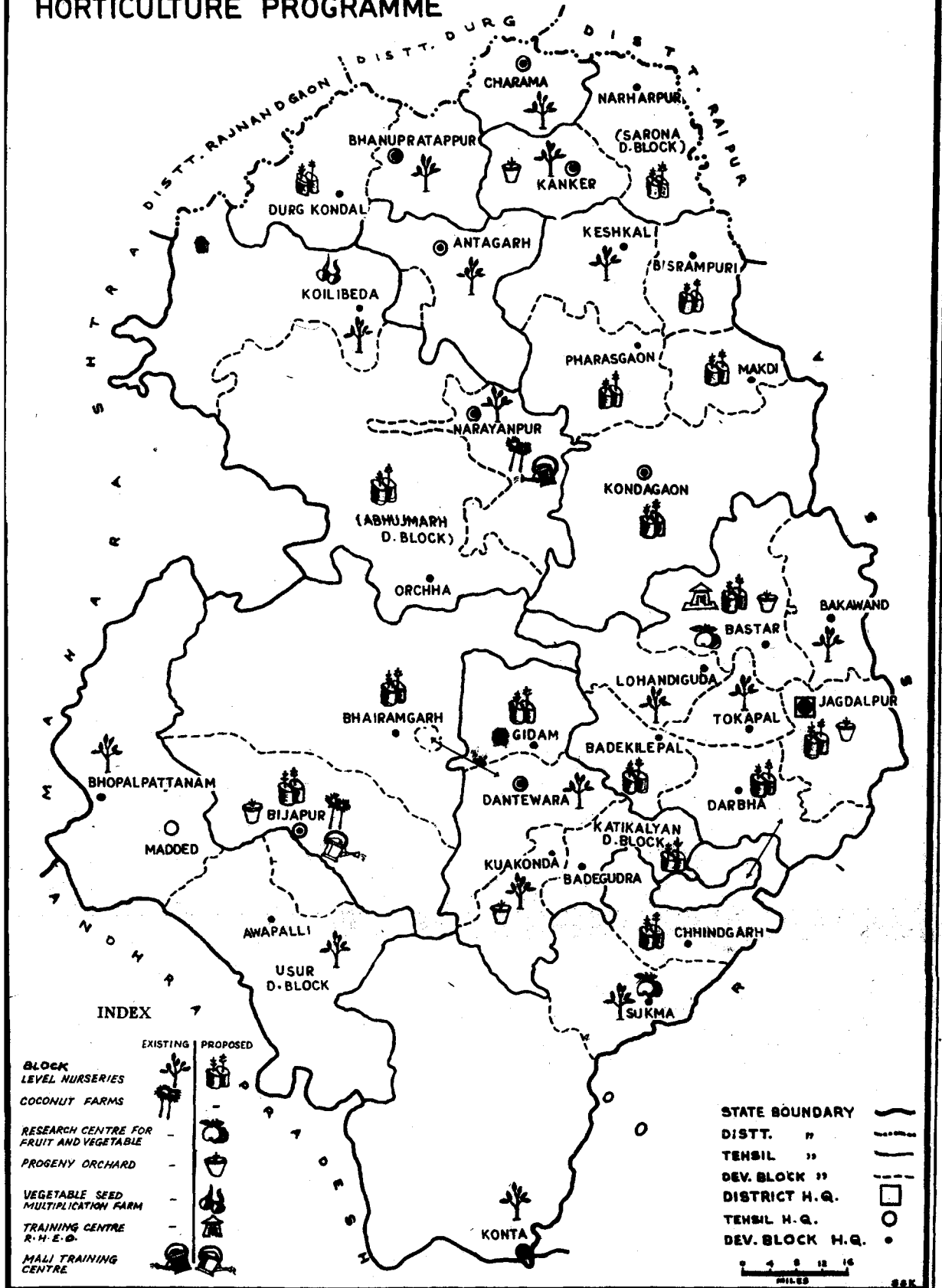
techniques may be used. The yields from wells is higher in rainy season which reduces gradually. It is estimated that irrigation wells yield about 5 to 20 cu.m. of water per hour during rainy and winter seasons but most of them become inefficient from irrigation point of view during summers.

The fertility of the soil is of no major consequence if improved techniques are adopted and all inputs are given according to recommended doses and periodicity. However, this factor creates other dimensions for which solutions must be forthcoming in adequate measure. Presently, about 75 per cent of the total available culturable area is under cultivation and it is assumed that agricultural development will ensure the coverage of the remaining culturable land. The land that would be available after accounting for forest and culturable land area would be as follows :

	('000 ha.) 1981-82
(a) Land put to non-agricultural use	81.00
(b) Barren and unculturable land	125.90
(c) Permanent pastures and grazing lands	152.20
(d) Uneconomic scattered patches of land	30.40
(e) Old fallows	54.70

Obviously, land put to non-agricultural uses should be out of the reckoning. The rest of the land is mostly government land. Horticultural development programme can utilise part of this land after making necessary improvements, but supervision and management of the programme would involve high expenses. It is estimated that reclamation of one ha. of land, trench fencing, digging of pits, filling and planting, cost of plants, manures, fertilizers, irrigation, plant protection, tools and protection for five years would involve an expenditure of about Rs. 17,625.00. This aspect apart such a programme would not involve the tribals except as wage paid labourers. The objective of horticulture development is not only to maximise the use of resources but also to benefit the tribal population of the area and so provide them with an alternative or subsidiary source of income. There is, therefore, need to formulate the programme in such a way as to meet both the objectives. The strategy should be to provide the tribal farmer with necessary inputs and a share in management costs so that

# MADHYA PRADESH DISTRICT BASTAR HORTICULTURE PROGRAMME



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he feels involved and take the programme enthusiastically in hand. The waste lands in and around tribal settlements should be given to tribal tenants on lease and where the land area is large forming big chunks it may be leased to the community Panchayat. The role of the department in both these ventures should be limited to guidance, demonstrations, supply of essential inputs and training of the people. The main role of the department is envisaged in organising proper research and to raise and supply suitable plants to be supplied to the farmers.

The district, for purposes of horticulture development may be divided into three zones and two sub-zones. The development blocks forming part of these are shown below :

S.No.	Zone/Sub-zone	Development Blocks
1.	Northern zone	Charama, Saronā, Kanker, Bhanupratappur, Durgkondal.
2.	Central zone	Antagarh, Koilibeda, Narayanpur, Keshkal, Baderajpur, Pharasgaon, Makdi, Kondagaon, Bastar, Bakawand, Jagdalpur, Darbha, Tokapal, Lohandiguda, Bastanar.
3.	Southern zone	Dantewara, Geedam, Kuakonda, Katikalyan, Bijapur, Bhairamgarh, Bhopalpatnam, Usoor, Kōnta, Sukma, Chhindgarh.
4.	Abujhmar (Sub-zone)	Orchha
5.	Bailadilla (Sub-zone)	Part of Dantewara.

The northern zone comprises five development blocks. The area is plain and it can be considered as an extension of Chhatisgarh plains. However, altitude is generally higher as compared to the plains in the north. Kanker is 1962 ft. and Bhanupratappur is 1145 ft. above mean sea level. The rainfall in the area averages to about 1364 mm in Kanker and 1498 mm in Bhanupratappur tehsil areas. The soils are mainly laterite but sandy and clay loam occur frequently. The annual mean temperature based on observations at Kanker station for 30 years, varies between 19.9°C minimum and

31.6°C maximum although mean maximum <sup>142</sup> touched 43.0°C in the month of May and mean minimum 7.2°C in the month of January. The yearly mean wind velocity was 5.8 km. p.h. a maximum on 10.0 km.p.h. in the month of June and a minimum of 2.2 km.p.h. in the month of January. Based on these observations the area appears to be suitable for growing mango, guava, lime, kathal, cashew, banana and amla etc. In addition coconut plantation can also be attempted.

The Central zone includes fifteen development blocks. Its boundaries meet that of Maharashtra in the west and Orissa in the east. The general elevation from mean sea level at Jagdalpur, Kondagaon and Narayanpur is 1821, 2156 and 1914 ft. respectively. The rainfall in these respective areas averages about 2158 mm, 1547 mm and 1281 mm. The average annual temperature as recorded at Jagdalpur observatory, ranges between 31.2°C maximum and 18.9°C minimum. The highest mean maximum was 42°C in the month of May lowest mean minimum was 6.9°C in the month of December. The areas being similar to the north in soil composition appears suitable for mango, guava, cashew, jack-fruit and banana. The crops of coconut, litchi and chiku may also be introduced.

The southern zone consists of eleven development blocks. It is surrounded on the west by Maharashtra, on the south by Andhra and on the the east by Orissa. The height above mean sea level is 1035 ft., 1166 ft. and 927 ft. at Bijapur, Konta and Dantewara respectively. The average rainfall comes to about 1409 mm, 1773 mm and 1412 mm respectively for the above mentioned areas. The soils are sandy and patches of black soil occur occasionally. The average daily temperature ranges between 34.0°C maximum to 18.0°C minimum. The area, like the rest of the district, is well drained and is suitable for growing mango, citrus, coconut, cashew, coffee and guava.

The southern zone consists of a sub-zone of Bailadilla area having a maximum height of about 4000 ft. from the mean sea level but general altitude remains around 1000 ft. The area is suitable for all the crops mentioned for south zone and in addition pear and potato may also be grown with advantage.

Abujhmar is a sub-zone of central zone and is a compact hilly

area inhabited by people commonly known Hill Marias. It is the least surveyed area of the district and is crisscrossed by a multitude of hill ranges, valleys, rivers and nallahs. The roads are negligible in the area and the status of agriculture almost primitive. Some of the flat plateau lands are covered with grasses of 2 to 3 meters height. The main problem in the context of horticultural development of the area is irrigation during the period February to June since water sources are at a distance, generally from 1 to 2 km. and it would be problematic to provide artificial irrigation. The area being hilly rain water takes a faster run off and owing to unhindered drainage water finds its way to the Indrawati. The hill tops and their slopes remain dry with poor moisture contents. The area, therefore, is only suitable for such trees which can adapt to the scanty water conditions in the root zone. Mango grows naturally and it can be improved. In valleys and in abadi areas coconut, kathal, banana and better quality mango can be grown.

The present status of fruits and vegetables in the district requires improvements. The area under fruits and vegetables in the district is larger in tehsils having urban areas where there is persistent demand for both fruits and vegetables. Jagdalpur tehsil which also includes Jagdalpur town, the district headquarter, has the largest percentage of area under fruit crops followed by Kondagaon, Dantewara and Kanker. The following table illustrates the point :

1981-82

S.No.	Tehsils	Area under fruits (Ha.)	Percentage
1	2	3	4
1.	Bhanupratappur	66	3.28
2.	Kanker	195	9.68
3.	Narayanpur	77	3.82
4.	Kondagaon	310	15.38
5.	Jagdalpur	789	39.16
6.	Dantewara	242	12.00
7.	Bijapur	175	8.68
8.	Konta	161	8.00
Total :		2015	100.00

The production of fruits has been estimated at 10,200 tonnes which makes about 15 grams per capita per day availability of fruits in the district. Among fruits Mango has the largest area (87 per cent) followed by banana (5.0 per cent). Tehsilwise details are as follows :

S. No.	Tehsil	Fruits (Ha.)							Total
		Guava	Papaya	Banana	Mango	Sweet orange	Lime	Others	
1	2	3	4	5	6	7	8	9	10
1.	Bhanupratappur	1	-	2	57	-	-	6	66
2.	Kanker	9	-	7	152	-	-	27	195
3.	Narayanpur	1	-	8	64	-	-	4	77
4.	Kondagaon	2	1	44	258	-	-	5	310
5.	Jagdapur	7	1	28	669	3	-	86	789
6.	Dantewara	-	1	10	226	-	-	5	242
7.	Bijapur	-	-	1	173	-	-	1	175
8.	Konta	-	-	6	151	-	1	3	161
Total :		20	3	101	1750	3	1	137	2015

The fruit crops as indicated above are common varieties which are grown by people for non-commercial consumption. Mango which covers the largest fruit crop area is of ordinary variety having little sale value but can be sold in the market on considerable profit if the fruit is cut, dried/grounded and packed. Banana has been introduced largely by immigrants from West Bengal and it is a crop which is generally grown in the backyard of the residential house. The status of fruit production can indeed be bettered by improving the quality of trees/plants and providing doses of fertilizers, pesticides and irrigation. A programme for the introduction of crops like coconut, cashew, chiku, pear, litchi etc. and improvement on plum, amla, guava, jackfruit and mango can be taken up in the district.

Similarly, the status of vegetables can also be improved. The district is producing vegetables mainly of Kharif variety. Rabi vegetables, like fruit crops, have shown urban bias and their area is largest in Jagdalpur tehsil followed by Kanker and Kondagaon. The total area under vegetable and spices was 5608 ha. in 1981-82 out of which vegetables accounted for 4765 ha. Further analysis shows that Kharif vegetables

form about 71 per cent of the total area under vegetables. Tehsilwise details are shown below :

S.No.	Tehsils	Vegetables ( ha.)			Percentage of Kharif
		Kharif	Rabi	Total	
1	2	3	4	5	6
1.	Bhanupratappur	114	38	152	75.0
2.	Kanker	289	326	615	46.9
3.	Narayanpur	234	63	297	78.8
4.	Kondagaon	369	153	522	70.7
5.	Jagdalpur	1244	643	1887	65.9
6.	Dantewara	227	52	279	81.4
7.	Bijapur	306	46	352	86.9
8.	Konta	600	61	661	90.7
Total :		3383	1382	4765	70.9

It also becomes apparent from the above that Kanker has the smallest percentage of Kharif vegetables as compared to other tehsils. It is mainly because of the proximity to Raipur town and its favourable location for easy transportation to the urban market.

Variety-wise, vegetable status is gradually changing in the northern and central parts of the district because of urban demand. The induction of development functionaries at the tehsil and block levels has also created a demand and a sort of awareness in the cultivators. Nevertheless the largest area remains under sweet potato which the tribal grows for himself. The area under potato and onion has increased in Jagdalpur, Kondagaon and Kanker. Crops like cauliflower, potato, radish, beans have been introduced and they have been adopted in all the tehsils of the district. However, their individual area is small and as such they have been lumped together under the heading other vegetables as shown below :



S. No.	Tehsils	Potato		Sweet Potato		Onion		Other Vegetables		Total	
		Kharif	Rabi	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi	Kharif	Rabi
1	2	3	4	5	6	7	8	9	10	11	12
1.	Bhanupratappur	-	-	8	6	-	2	106	30	114	38
2.	Kanker	-	10	74	8	-	40	215	268	289	326
3.	Narayanpur	-	2	77	1	-	-	157	60	254	63
4.	Kondagaon	-	21	107	1	-	18	262	113	369	153
5.	Jagdapur	1	47	186	2	-	91	1057	503	1244	643
6.	Dantewara	-	2	29	1	-	-	198	49	227	52
7.	Bijapur	-	1	7	-	-	-	299	45	306	46
8.	Konta	-	-	18	2	-	1	582	58	600	61
Total :		1	83	506	21	-	152	2876	1126	3383	1382

The change in the variety of vegetable crops has been made possible by the existence of a demand for such varieties, availability of irrigation facilities and extension efforts of departmental functionaries. The district is large in area and poor in communication linkages and hence change over to Rabi vegetables crops has not been possible in the interior of rural areas. The production of vegetables, including both Kharif and Rabi is estimated to be 26,500 tonnes which makes availability of vegetables as 40 grams per capita per day.

## 2. APPROACH AND STRATEGY

There is scope for raising both fruit and vegetable production. In view of agroclimatic conditions at different locations in the district good crops, both early and off-season, like tomato, cauliflower, peas, french bean, capsicum etc. can be grown which can go a long way in improving the economic status of vegetable growers. The reasons for low adoption of vegetable crops on a large scale in general and of relatively high investment crops in particular appear to be ineffective demand linkages with the area coupled with ignorance of improved production technology and low literacy. It has already been observed that urban linkages with the area

have induced vegetable growers to change the pattern of crops and to enter higher investment areas of crop husbandry. Given an assured demand linkages made effective by road and transport connections the farmer will give positive response to change the pace and pattern of existing horticultural practices and production. The process can further be quickened by improving the delivery of inputs like seed, irrigation, pesticides, credit etc. and by organising proper marketing of the produce. A programme for making the cultivator aware of and skilled in improved farming techniques with a view to equip him to think beyond his immediate consumption needs will go a long way in strengthening him to adapt to modern competitive situations which, in fact, are exploiting him today. However, the main difficulty lies in identifying climatic and local specific low investment varieties of crops which may be recommended to the farmer and which may prove economically uberous. It forms the area of research and horticultural farms with the objective of demonstration, seed/plant supply and meeting the research need be established in the district with proper equipment and personnel. It may also be useful to enlist the cooperation of the farmers in researching on their fields and to produce seed/plants for supply to other farmers.

In view of the above, horticultural development should aim at bringing long term changes in the existing structure of fruit and vegetable crops and for achieving this objective should experiment and research to bring forth such species of plants and vegetables which may give reasonably high returns on investments by farmers. There is scope to investigate the economics of Kharif potato and onion especially in view of the situation that adequate irrigation facilities to all the regions of the district can only be provided at a gradual pace. It can also be investigated whether in irrigated areas vegetable production can be quantitatively and qualitatively improved to create a base for vegetable seed industry specially for solanaceous, allianecious and root crops. Other areas for investigation are in the field of spices. Presently chillies constitute the major part of spice crops. There is need to improve and propogate improved varieties of such spice crops as ginger, turmeric, corriander, cardemom, clove, etc. These erops, if found suitable, can change the

whole economic outlook of the farmers and they can be benefited immensely.

Farm forestry is another area in which tribal farmers can be profitably engaged. It has already been discussed that transformation of waste lands into economically producing units can be done by adopting a policy of allotting these lands to nearby tribals and community groups. Such lands when given to tribals can be utilised for farm forestry. Horticulture department can take up a programme for propagation of such plants as bamboo and subabool which may cater to the domestic needs of tribals as well as present a commercial proposition to them.

The district is dominated by tribal population which is both poor and ignorant. Any programme to be taken up in the area shall have to be adjusted to this fact. The areas for which development strategy can be formulated and applied are (a) farm forestry (b) fruit growing and (c) improvement in vegetables both in terms of area coverage and yield returns. For purposes of horticulture development a clear cut demarcation of responsibility has to be made between Forest and Horticulture departments. Fruit plantation in forest areas should be the responsibility of forest department. It will require a policy decision to determine whether waste lands outside forest areas are to be transferred to forest department for planting fruit trees. As stated earlier fruit plantation on government lands outside the jurisdiction of forest department would require high investments both from the point of view of management and effective supervision. A huge machinery shall have to be created for converting waste lands into productive horticultural farms. However, waste lands in and around inhabited settlements and within jurisdiction of revenue administration can be managed by transferring them to individual tribal farmers. In these areas Horticulture Directorate can play a direct part in reclaiming lands and stocking them with suitable fruit crops by adopting a mechanism to help individual farmers or community groups. Some of these waste lands may be given to Horticulture Department for establishing farms and nurseries. Similarly in cases of developing waste lands in the possession of farmers a programme of farm forestry can be taken up by Horticulture Department with or without the help of forest department.

### 3. Plan Proposals

Within the framework of previously discussed perspective following programmes for horticultural development are being proposed :

#### Establishment of Research Sub-Station

The research centre of Kumrawand farm has not been adequately equipped to carry out research work on fruits and vegetables, both on account of the lack of funds and supporting research personnel. It is, therefore, proposed to strengthen the research centre of Kumrawand for taking up research programmes with focus on fruit and vegetable research and to establish a sub-centre at Sukma with a view to supplementing and strengthening the research programme of National Agricultural Research Programme. The emphasis is proposed to be given to develop such varieties of plants and vegetables which may mature with the water available during monsoons and may not require artificial irrigation. In view of soil conditions, climatic factors and rainfall a few varieties of fruit trees and vegetables have been identified for carrying out research work. They are :

	<u>Fruit Group</u>	<u>Vegetable Group</u>
1.	Mango	1. Tuber crops specially kharif potato.
2.	Coconut	2. Beans
3.	Pine Apple	3. Chillies
4.	Chiku	4. Tomato
5.	Jack fruit	5. Bringal
6.	Leechi	6. Potato
7.	Banana	7. Sweet potato
8.	Guava	8. Radish
9.	Kagji lime	9. Pepper
10.	Coffee	

The suitability of varieties developed elsewhere will also be studied by the centre. The local varieties will be screened and their suitable strains will be identified. The techniques of cultivation for obtaining optimum yields will also be developed.

For proper execution of research programme adequate technical and other personnel shall have to be provided to the research centre and sub research centre of Kumrawand and Sukma.

The scheme will involve an outlay of Rs. 100.00 lakh.

### **Progeny Orchard**

A programme for improving the quality and yield of fruit trees necessarily involves a massive preparatory work for making available necessary scion material. There are at present, no orchards in the district for obtaining reliable scion material. As such to sustain a large scale programme for preparation of grafted plants it is proposed to establish progeny orchards for different varieties of fruit trees with a view to providing reliable seed material to the farmers as well as to undertake research on their management techniques for obtaining higher yields progeny orchards for different species are proposed to be established in the following development blocks :

1. Mango	Bastar
2. Cashewnut	Kanker
3. Temperate Fruit and coffee	Dantewara-Kirandul
4. Jack fruit and guava	Jagdapur
5. Citrus	Bastar
6. Banana	Kanker
7. Aracanut	Bijapur-Pamalwaya

The coconut orchards have already been established at Keralapal and Pamalwaya from where seed materials will be supplied to the farmers in the district within 2 to 4 years.

The progeny orchards are proposed to cover an area of 20 ha each. It is estimated that one progeny orchard will require an expenditure of about Rs. 30.00 lakh to become functionally operative. The total outlay thus required for the implementation of the scheme would be Rs.270.00 lakh.

### **Vegetable Seed Multiplication Farm**

The district generally grows kharif vegetables but in recent years rabi vegetables are gaining ground particularly in the northern and

central parts of the district. Rabi vegetables can be developed as a subsidiary source of income for the farmers. But the main constraint is the lack of the supply of good quality seeds to the cultivators.

At present there is no vegetable seed multiplication farm in the district wherefrom the farmers could get reliable seed. It is proposed to establish one such farm at Pakhanjore (20 ha.) on the land likely to be transferred by the Dandakaranya Project. The farm will raise vegetable seed and will also study the performance and yield of various vegetable crops particularly of tuber crops. For proper management of the farm a trained and qualified groups of technical and complementary personnel would be needed. It is estimated that an outlay of Rs. 30.00 lakh would be required to meet establishment and other expenses during the plan period.

#### **Establishment of Block Level Nurseries**

The main object of establishing nurseries at block level is to raise fruit and farm forestry plants in different areas of the district with a view to (i) raise plants which may adopt suitably to the local environment (ii) increase crop yield and (iii) provide local cultivators with reliable fruit and farm forestry plants. In addition these nurseries will also promote top work on amla and ber and subsequently on mango. The programme envisages the establishment of nurseries both by the departmental agency as well as by private cultivators.

#### **(a) Operational nurseries**

There are at present 15 operational nurseries functioning in the district: It is felt that such nurseries should be established in each development block, so that different varieties of plants suited to the local environ be developed and the supply of such plants to the cultivators could be managed, properly. It is, therefore, felt that 17 additional nurseries be established in the remaining development blocks during the next plan period. These nurseries would be established on government land. The requirements to make these nurseries fully operational would involve appointment of technical personnel, provision of equipment and construction of working sites. It is estimated that each nursery will prepare one lakh plants annually and thus about 150 lakh plants would be available to be

given to cultivators. It is further estimated that about 1.5 lakh farmers would be benefited by the programme during the next plan period.

The scheme is likely to involve an outlay of Rs. 275.00 lakh out of which, Rs. 170.00 lakh would be needed for establishing 17 new nurseries and Rs. 1.05 lakh for strengthening the 15 existing nurseries.

**(b) Private nurseries**

The people of the area should also be encouraged to take up establishment of nurseries of their own with a view to perpetuate the habit of plant raising and creating for themselves a source of additional income. However, people in the initial stages, would have to be given some sort of incentive. It is therefore, proposed to provide mother plants free of cost to the cultivators and financial subsidy to the extent of fifty per cent of the expenditure incurred on the management/supervision and care of plants. The financial subsidy should be given in instalments and in proportion to grafted plants prepared. The scheme would be of great demonstrative value and would, in due course of time, help in spreading the programme of fruit plantation and in establishing processing units in the district. It is estimated that a nursery in an area of about 25 acres would involve an expenditure of about Rs. 25000.00. It is proposed to establish 20 such nurseries and accordingly an outlay of Rs. 5.00 lakh is proposed.

The total expenditure likely to be incurred on the implementation of the scheme would be as follows :

	<u>Estimated Expenditure</u> <u>(Rs. lakh)</u>	
1. Operational nurseries establishment of		
(a) New nurseries	17	170.00
(b) Strengthening existing nurseries	15	105.00
2. Establishment of private nurseries	20	5.00
	<u>52</u>	<u>280.00</u>

### **Rubber, Tea and Coffee Plantation.**

Bastar district climatically offers scope for the cultivation of rubber, tea and coffee. Physiologically, too, the district is suitable for these crops. However, no firm proposals are being put forward as reliable data are not available with regard to these crops in the district. The respective Boards of Rubber, Tea and Coffee have been approached to take up experimental plantations in collaboration with the State department of Horticulture. The State Government will provide land for farms and labour for plantation and maintenance. The Rubber Board has agreed with the request and similar acceptance is expected from the other two Boards. After the results of these experimental farms are made available further programme for their development will be drawn up and implemented.

### **Fruit Plantation**

A programme of fruit tree plantation in the form of community orchard has already been tested in the Kanker area of the district with encouraging results.

The programme has become popular among farmers. It would now be advisable to undertake this programme on a large scale. The programme can be taken up separately for areas where irrigation facilities are available and where water dependence is purely on monsoon.

#### **(a) Irrigated Community Orchard**

Coconut plantation can be introduced in southern areas of the district in the command of lift irrigation schemes or in areas where irrigation facilities can be obtained from flowing rivers, natural springs and nallahs. The Bailadilla area in Dantewara development block and areas in Usoor development block where perennial springs flowing down from mountains can be utilised for irrigating orchard crops, are ideally suited establishing community orchards. It is proposed to set up 100 community orchards covering an area of about 1000 ha. in the district with a minimum area of 10 ha. per orchard. It is estimated that coconut plantation in one ha. would cost about Ra. 17,000.00 in five years. The cost, apart from supervision costs, would include expenses on account of land clearing, fencing, digging of pits, drain construction, fertilizers, irrigation, plant



protection, equipment, tools, and plantation costs. The programme would need the services of technical and extension personnel.

The scheme will involve an outlay of Rs. 201.45 lakh out of which Rs. 170.00 lakh will be spent on procuring quality plants and meeting plantation costs.

#### (b) Unirrigated Community Orchard

The plantation of mango, guava, cashew and kathal etc. is proposed in 4000 ha. in areas having no irrigation. The plantation will be done during the plan period in orchards both on private land and on government land. The implementation of this programme is proposed through three pilot project centres to be created at Kondagaon, Jagdalpur and Narayanpur. These centres will be manned by a team of technical personnel with necessary accompaniment of assisting staff.

The scheme will involve an outlay of Rs. 1200.76 lakh including cost of equipment. The farmers may also be provided with some sort of compensatory subsidy for refraining from inter culture activity in the area under plantation.

The total cost of the programme including both the schemes will be about Rs. 1402.21 lakh.

Mango and Mahua are the common tree crops for most of the areas of the district. The tribals of the area are dependent upon these and a host of other varieties of fruits and tubers grown naturally in the forest. This natural inclination of the tribal can be channelised to increase the yield and variety of tree crops in the area for both local consumption and sale in the market. The soil and climatic conditions in different parts of the district are quite suitable for introducing new varieties of fruit crops such as coconut, coffee, pineapple, apricot etc. Similarly some varieties of vegetables can also be introduced in the area. Keeping these objectives in view the following programme is proposed.

#### Fruit Plants

It is proposed to introduce fruit plants in the district which are not grown at present and which can be helpful in improving the econo-

mic conditions of the farmers. These plants are coconut, banana, coffee, pineapple and arecanut. Coconut and banana can be grown in the backyard and coffee under the shade of trees like mango and mahua. The plants of these varieties are proposed to be distributed among tribal farmers. It is also proposed to subsidise the cost. The number of beneficiaries is likely to be 6.80 lakh. The details of the programme for the plan period are given below :

Sl. No.	Plant	No. of plants per farmer	Total plants proposed to be distributed	Extent of subsidising cost	No. of beneficiaries	Expenditure (subsidy) to be borne by Govt. (Rs. in lakh)
1	2	3	4	5	6	7
1.	Coconut	5	6,00,000	75%	1,20,000	72.00
2.	Banana	5	25,00,000	75%	5,00,000	25.00
3.	Coffee	5	1,00,000	100%	20,000	3.00
4.	Pineapple	5	1,00,000	100%	20,000	2.00
5.	Arecanut	5	1,00,000	100%	20,000	8.00
			34,00,000		6,80,000	110.00

Vegetables are an essential part in the balanced diet and are also a good source of income. It is, therefore, proposed to distribute 2 lakh seed packets of chillies, beans, white gourd, pumpkin etc. to 2 lakh farmers during the plan period.

Root crops have a good scope in the district and need to be popularised. It is proposed to layout 500 demonstration plots of Kharif potato turmeric, ginger and arvi in the fields of tribal farmers during the plan period. The size of the plot will be 1/10th of a ha. and the full cost will be borne by the government.

The vegetable popularisation programme will involve an expenditure of Rs. 3.00 lakhs.

#### Farm Forestry

With a view to lessen the pressure on forests for fuelwood animal feed and other domestic requirements it is proposed to distribute 42 lakh

farm forestry plants like bamboo and subabul to the farmers free of cost for growing them on their farms. The programme of distribution of 100 plants to prospective farmers will involve an expenditure of Rs. 42.00 lakh and will benefit about 42 thousand farmers of the district.

The total outlay required for this scheme will be Rs. 156.00 lakh as per details given below :

	(Rs. in lakh)
A. Distribution Fruit Plants	110.00
B. 1. Distribution of Vegetable seed packets	3.00
2. Vegetable demonstration plants	1.00
C. Farm Forestry	42.00
	<u>156.00</u>

There is a large number of local variety plants of mango, aonwla and ber which have no economic value. It is proposed to change 3.40 lakh such plants to commercial varieties by top working method. About 1.4 lakh trees will be worked upon by the departmental staff posted at operational nurseries and two lakh plants by the trained local persons. About one lakh farmers are likely to benefit from this scheme.

It is proposed to train young people from rural areas in the methods of top working with a view to develop the skill in local people and make available such expertise in rural areas for removing dependence on outside agency. The training will be of 20 days duration during which period each trainee will be paid Rs. 100.00 as stipend and another Rs. 100.00 in the form of tool kit. On completion of the training these trainees will be required to go in their area and start working.

### **Marketing**

Horticultural programme proposed to be taken up in the district is expected to augment the supply of fruits and vegetables. The increase in the supply of fruits as a result of quality and yield improvements in the existing tree crops and introduction of new fruit crops in the area will take place gradually and after the lapse of gestation period needed for the trees to reach the fruition stage but the supplies of vegetables will increase immediately. There is, therefore, immediate

need for providing urban market for the disposal of surplus produce. Road communications are not only poor but would remain uneconomical from the view point of transport load for at least some time to come. Vegetables being perishable goods need quick transport system. In the present context, the alternative is to make the State Road Transport Corporation ply their buses on such routes which are not economical for them but are important from the point of view of providing exit to the surplus vegetable and fruit production of the area. It is proposed, therefore, to provide a fixed subsidy to the Madhya Pradesh State Road Transport Corporation in the initial stages on a formula to be worked out on the basis of estimated surplus production of vegetables and other marketable produce in the area and the likely losses of revenue to the corporation.

### **Plant Production**

Horticulture development programmes will cover the district extensively and in each successive year will become increasingly operational with the availability of infrastructure. Alongwith the expansion of the programme it would also become increasingly essential to extend plant protection measures with a view to maximise production from tree and vegetable crops. It is, therefore, proposed to establish and organise seven plant protection squads which will extensively cover the area for providing plant protection and spraying on orchard and vegetable fields. In the initial stages these services and medicines shall have to be provided free of cost with a view to creating confidence among the tribals about the efficacy of the technique and keeping under consideration, their poor economic circumstance. The tribal growers will be given free medicine. Plant protection equipment, will be provided to them on a 75 per cent subsidy basis. These squads will also be utilised to impart informations to villagers with a view to raising their awareness levels, particularly of tribals. The programme is likely to cost Rs. 20.00 lakh.

### **Training Programme**

The proposed large scale Horticulture Development Programme will necessitate a comprehensive programme of training for rural extension officers and farmers. Keeping this in view proposals for organising formal and informal training of staff and farmers are produced below :

**(A) Training of Staff**

The departmental staff will be trained at the training centres already functioning in the State. Nevertheless, there is need for the staff to be sent to Kerala and other States for getting training and obtaining technical know-how about the efficient management of crops like coconut, arecanut, coffee, pineapple, kharif potato etc. The proposed training programme will involve an expenditure of about Rs. 5.00 lakh.

**(B) Visits of Farmers**

Any scheme of formal training for the farmers is not likely to succeed since most of the farmers are illiterate. They, on the other hand, have vast practical experience of cultivation, soil characteristics and plant behaviour in climatic conditions prevalent in their areas. If they are exposed to modern methods of horticultural practices and new crops having potential of being raised in the soil and climatic conditions of their areas they are likely to be greatly benefited. In view of the proposed programme of introducing coconut, arecanut, pineapple and banana on a commercial scale it is proposed to arrange visits of farmers in convenient batches to such places within and outside the State where cultivation of above mentioned fruit crops is successfully practised. It is estimated that if the proposed visits are arranged judiciously some 25000 farmers will be benefited. The estimated cost of the programme is likely to be about Rs. 12.50 lakh. The State Government's wholly owned Provident Investment Company has a large coffee plantation in Kerala where different varieties of crops are being grown. This plantation will be used for short term training courses for small groups of tribal farmers from Bastar.

**(C) Mali Training Centre**

One Mali Training Centre was established in Keralapal (Narayanpur) in 1982-83. Only 30 trainees can be trained at this centre at one time. The trainees from the southern parts of the district do not find it convenient to go to this centre. One more Mali Training Centre is therefore, proposed at Pamalwaya (Bijapur).

The scheme is likely to involve an expenditure of Rs. 15.00 lakh including establishment and stipendary costs.

**(D) Training of Rural Horticultural Extension Officers Centre**

A training centre for Rural Horticultural Extension Officers is proposed to be set up at Bastar so that the tribals of the district, selected for the posts are given training. Looking to the size of the district a large number of such officers will be required during the next Plan period. The centre will impart training to 60 persons in one session and there will be two such sessions in a year.

The scheme is likely to involve an expenditure of Rs. 35.00 lakh.

Total expenditure on training programme will be Rs. 67.50 lakh details of which are as follows :

	(Rs. in lakh)
1. Training of Staff	5.00
2. Training & Visits of Farmers	12.50
3. Mali Training Centre	15.00
4. Training of Rural Horticultural Extension Officer Centre	<u>35.00</u>
Total:	<u>67.50</u>

Horticulture development programme has been proposed keeping in view data on land use, and physiological and climatic characteristics of the district. Fruit growing as a commercial proposition is sufficient to change the economic conditions of the tribals in the rural areas provided yields are improved and packing, transportation and marketing is properly organised and managed. Packing, transportation and marketing are not strictly part of horticulture production programme and hence they have not been included here but elsewhere under appropriate heads. However, they do form part of the horticulture development programme in its entirety. The mechanism for establishing this huge base for horticulture development will initially require creation of infrastructure, organisation of training, supply of input materials and provision of a cadre of technical supervisory and extension personnel. The costs for complying with these requirements has been estimated for the five year period as below :

(Rs. in lakh)

<b>1. <u>Infrastructure</u></b>	
(a) Irrigation	23.95
(b) Land levelling	8.82
(c) Fencing	44.80
(d) Plantation costs, including raising and maintenance	858.00
	<u>935.57</u>
<b>2. <u>Training</u></b>	
(a) Training including study tools	19.50
(b) Stipend	8.35
(c) Demonstration	1.00
	<u>28.85</u>
<b>3. <u>Supply of Inputs</u></b>	
(a) Fruit Plants	110.00
(b) Vegetable Plants	3.00
(c) Farm Forestry Plants	42.00
(d) Medicines	28.00
(e) Manures	3.00
(f) Agricultural equipment	27.50
(g) Subsidy	27.00
	<u>240.50</u>
<b>4. <u>Operational</u></b>	
(a) Vehicles	301.70
(b) Bullocks	3.20
(c) Recurring contingencies	338.80
	<u>643.70</u>
<b>5. <u>Technical supervisory, extension and research organisational set up.</u></b>	
(a) Establishment	200.15
(b) Buildings	351.59
(c) Furniture	15.11
(d) Books	1.07
(e) Office equipments	0.50

(Rs. in lakh)

(f) Maintenance	22.50
(g) Contingencies	74.00
	<u>665.02</u>
	2513.64

The total cost of the programme works out to Rs. 25.14 crore out of which Rs. 18.8 crore will be of non recurring nature.





## VETERINARY AND ANIMAL HUSBANDRY

### 1. General Review

Livestock since its domestication era have played a vital role in human life. It is further expected to continue to occupy a pivotal position in the future as far as economic and social life of human community is concerned; more so in Bastar which is tribal dominated and is poised at the threshold of development awaiting a break through in agriculture and industrial sectors. The contribution of cattle in these sectors is highly significant in terms of a dependable source of power both for agricultural operations and transportation of produce to the markets. This dependence is not likely to be terminated for quite some time in the future inspite of technological advances.

The economy needs cattle for various uses ranging from raw material for cottage and small scale industries to the maintenance of human health and production for human feed. The cattle is the source of providing hides, skins, bones, guts etc., for the manufacture of various essential articles of human need and milk is the sole source of providing animal proteins to the people specially vegetarians who form the bulk of total population. Tribals, as a rule, are not pure vegetarians but like other non-vegetarians they too cannot afford non-vegetarian diet on a regular basis. The intake of non-vegetal material, i.e., material coming from animals and birds is not sufficient for making any class of people purely non-vegetarian. Hence, the importance of protein source of cattle cannot be undermined until a complete cultural and economic transformation of the countryside takes place. Tribals do not generally slaughter their goats or poultry for consumption of meat except on religious and ceremonial occasions. They depend generally for the meat supply on wild animals of all varieties available in the forest. However, its supply from forest sources has become scarce. For maintaining the required nutritional level it is estimated that intake of 250 grams of milk per day is necessary for a child to meet the demand of protein from animal sources. In the case of an adult the minimum required intake of

milk is estimated to be 200 grams. Tribals are deprived of milk consumption on account of their tradition. They do not consume milk and eggs. Some of the tribal communities do not even milk their cows. They traditionally believe that the calf has the exclusive right to consume the milk of its mother. The origin of this tradition may be attributed to the poor yield of milk from the local cattle. It is estimated that the calf requires feed equivalent to about one tenth of its body weight which is supposed to be about 15 to 20 kg. at the time of birth. The requirement of feed, therefore, for the newly born calf would be about 1.5 to 2.0 kg. of milk which the cows of the area are not probably in a position to produce or may produce just somewhere in the neighbourhood of this quantity. The tribals in their natural wisdom perhaps recognised this fact and opted for a better alternative, i.e. owning a full grown healthy bull rather than meagre milk supply insufficient to meet the demand of a normal household. The option became tradition which still continues while the alternative source of hunting wild animals for the supply of animal protein has almost banished. Now, some other alternative has to be found out. An improvement in the quality and yield of the cattle can prove a good economic substitute. While attempting to improve the quality and yield of the cattle, the tribal has also to be motivated with a view to bringing a gradual change in this outlook in regard to the consumption of milk and eggs.

The per capita availability of cattle in the district is not in excess of the likely demand. In 1981-82 there were 4 heads of cattle for every five persons. The general decadal growth of cattle in the district from 1972 to 1982 has been 5.8 per cent for the combined strength of cattle and buffaloes. The average annual growth comes to about 0.6 per cent. Cattle and buffaloes individually increased at an annual average of 0.5 and 1.0 per cent, respectively.

The increase in the number of working bulls over the decade was 19.4 per cent and of buffaloes 6.4 per cent. However, their combined growth was about 17.1 per cent. These figures do not give the whole picture of the increase in the number of working cattle. A significant number of cows and buffaloes also function as working cattle which underlines the paucity of working cattle in the district. The growth of

working cows was about 19.1 per cent over the decade while the number of working buffaloes was more than doubled during the same period. Taking working cattle as a whole the average annual growth over the decade works out to about 1.8 per cent. Their per capita availability for working cultivators is in a ratio of 6.5 working cattle for every 5 cultivators. This ratio includes female working cattle. As compared to 1972 the ratio has improved very slightly.

The growth of milch cattle has registered a significant rise over the decade. While cows in milk added at an average annual rate of 5.4 per cent, the buffaloes increased by 7.2 per cent over the same period. The overall average annual growth was 5.6 per cent. The difference in the composition of total milch cattle and cattle in milk remained almost the same over the decade. The high growth of milching cattle including buffaloes appears to be on account of immigration of cattle as a result of beneficiary schemes being implemented under integrated rural development programme and development strategy of dairy extension programmes.

Young stock constitutes about 30.0 per cent of the total cattle and about 16.0 per cent of the total buffalo population.

The distribution of cattle amongst various sub zones of the district is as follows :

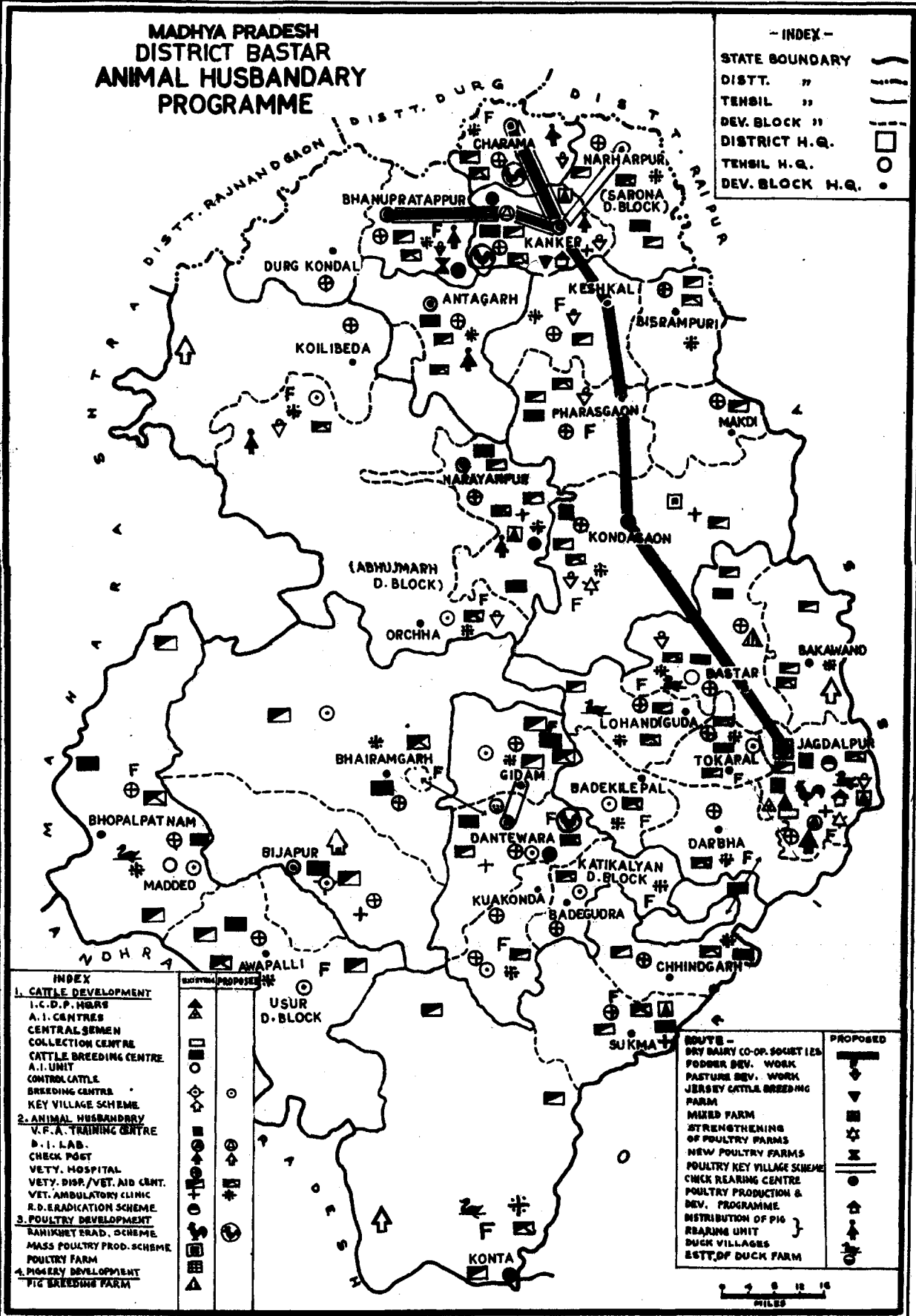
(Percentages)		
Zone	Total cattle	Total buffaloes
1	2	3
North	15.9	19.1
Central	44.3	67.9
South	39.8	13.0

The north zone comprising Kanker and Bhanupratappur tehsils and central zone made up of Kondagaon, Narayanpur and Jagdalpur tehsil share about 60 per cent of the total cattle and 87 per cent of the total buffaloes. The remaining 40 per cent cattle and 13 per cent buffaloes are in the south zone. It would be worthwhile to examine the distribution of working cattle and buffaloes in different tehsils so as to form some idea about the availability of animal power for draft purposes. Tehsil

# MADHYA PRADESH DISTRICT BASTAR ANIMAL HUSBANDRY PROGRAMME

- INDEX -

STATE BOUNDARY	—
DISTT. "	---
TENSIL "	----
DEV. BLOCK "	-----
DISTRICT H.Q.	□
TENSIL H.Q.	○
DEV. BLOCK H.Q.	●



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- CATTLE DEVELOPMENT**
  - I.C.D.P. HQR
  - A.I. CENTRES
  - CENTRAL SEMEN COLLECTION CENTRE
  - CATTLE BREEDING CENTRE
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  - V.F.A. TRAINING CENTRE
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- POULTRY DEVELOPMENT**
  - BANIKWET ROAD. SCHEME
  - MASS POULTRY PROD. SCHEME
  - POULTRY FARM
- PIGGERY DEVELOPMENT**
  - PIG BREEDING FARM

EXISTING	PROPOSED
▲	▲
□	□
○	○
◇	◇
+	+
×	×
•	•
△	△
▽	▽
☆	☆
⊕	⊕
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ROUTE -	PROPOSED
DRY DAIRY CO-OP. SOCIETIES	▽
PODDER DEV. WORK	▽
PASTURE DEV. WORK	▽
JERSEY CATTLE BREEDING FARM	☆
MIXED FARM	☆
STRENGTHENING OF POULTRY FARMS	☆
NEW POULTRY FARMS	☆
POULTRY KEY VILLAGE SCHEME	☆
CHICK REARING CENTRE	☆
POULTRY PRODUCTION & DEV. PROGRAMME	☆
DISTRIBUTION OF PIG REARING UNIT	☆
DUCK VILLAGES	☆
ESTT. OF DUCK FARM	☆



wise combined distribution of bulls, he buffaloes, cows and she buffaloes is given below for 1981-82.

Tehsil	(Percentages)	
	Animals over three years	
	Male	Female
1	2	3
<u>North</u>		
Kanker	11.6	2.7
Bhanupratappur	8.3	4.9
	<u>19.9</u>	<u>7.6</u>
<u>Central</u>		
Kondagaon	23.4	12.2
Narayanpur	8.9	1.6
Jagdapur	25.3	18.2
	<u>57.6</u>	<u>32.0</u>
<u>South</u>		
Dantewara	8.7	1.4
Bijapur	6.3	26.5
Konta	7.5	32.5
	<u>22.5</u>	<u>60.4</u>

It may be mentioned here that about 96 per cent of the total males and 35 per cent of the total females are used for work in the district. The above distribution showing the working males and females reveals that working male cattle and buffalo population to the extent of 57.6 per cent is concentrated in the central parts of the district which includes relatively developed and receptive tehsils like Jagdalpur and Kondagaon where settled cultivation was introduced much earlier. The southern zone comprising Dantewara, Bijapur and Konta tehsils share 22.5 per cent of the working males while north zone accounts for about 20.00 per cent. It also becomes evident that male working cattle is not sufficient to meet the drought requirement of the district and to meet the power requirement female population is being used. On account of this lack of male working population in the southern zone female working cattle is used to the extent of about 60 per cent of the total female working population. The central zone shares 32 per cent and the northern zone about

8 per cent. The concentration of male working cattle in the central parts appears to be on account of historical reasons and areas which came late in adopting agricultural practices needing cattle power have made good the loss by substituting female cattle for males.

The pressure on land and larger number of small holdings have increased the demand for cattle power. Development of agricultural techniques in some parts of the district have further accentuated this demand. This appears to be the reason for the use of female cattle power in the northern and central parts of the district. The inadequacy of cattle power can be judged by the fact that for every cultivator the availability of working cattle is 1.3 as against the 2 normally required for agricultural operations or for drawing a bullock-cart. Areawise the availability is one working cattle for every 1.1 ha. of net sown area. The distribution of cattle according to the size of land holdings is not readily available but on an average there are slightly more than 3 working cattle per average holding of 4.4 ha. which means that not even a full working animal is available for one hectare of area of land holdings. Normally it is expected that bigger land holding would be having more working cattle and thus the smaller land holdings must not be having sufficient cattle to meet their draught requirements. Similarly the relationship between the availability of cattle power and ploughs reflects the same thing. There were 3,44,159 ploughs with the cultivators for which even number of pairs of working cattle would be needed. The distribution of these ploughs would again be weighted in favour of bigger land holdings since they fall short of the total number of cultivators in the district and are sufficient to about 59 per cent of the total cultivators. It is amongst these cultivators that the maximum working cattle is supposed to be distributed.

The inference of this whole gamut of discussion is that the cattle strength of the district is not in excess of its demand. The demand for cattle is likely to increase as efforts to improve agricultural production technology yield results. Road development programme in the district will further increase the demand of animal power for meeting transportation requirements. Keeping in view these developments concerted efforts have to be made to improve the quality of the cattle with a view to improve

its efficiency. A more egalitarian distribution of working cattle amongst land holdings would also be required so as to make marginal farmers self sufficient but it has also to be seen that economics of marginal farming should be able to support necessary heads of cattle.

Another important aspect of cattle requirement is the production of milk and milk products. The growth of milch cattle over the decade 1972 to 1982 was 41.8 per cent giving an average annual growth of about 4.2 per cent. The average annual increase in case of cows and buffaloes in milk was 5.4 and 7.2 per cent respectively. Tehsilwise distribution of cows and buffaloes in milk is given below :

Tehsil	(Percentages)	
	Cows	Buffaloes
1	2	3
<u>North</u>		
Kanker	9.1	9.2
Bhanupratappur	4.6	3.6
	<u>13.7</u>	<u>12.8</u>
<u>Central</u>		
Kondagaon	18.5	44.8
Jagdarpur	15.1	13.3
Narayanpur	14.0	11.3
	<u>47.6</u>	<u>69.4</u>
<u>South</u>		
Dantewara	9.9	3.8
Bijapur	16.8	9.5
Konta	12.0	4.5
	<u>38.7</u>	<u>17.8</u>

The distribution of cows and buffaloes above shows a heavy concentration in the centre. Kanker, Kondagaon and Jagdarpur tehsils together share about 43 per cent of cows and about 67 per cent of buffaloes in milk. These three tehsil headquarters are located on Charama

Jagdapur road. The villages along both sides of this road are relatively more exposed and approachable to extension functionaries. The existing milk collection route covers these villages. Besides, the Integrated Rural Development programme and Dairy Corporation's activities have made this area conscious of the advantages of cattle rearing and the concentration of milch cattle in this area and parts of these tehsils appears to be the result of these activities. Other milk collection routes are Kanker-Bhanupratappur, Bhanupratappur-Hatkondal and Bhanupratappur-Narayanpur. All these routes are located in the northern and central parts of the district. Along these milk routes Buffalo acceptance appears to have increased on account of its higher milk yield as compared to the cow. Although these areas are having advantage of market influences it does appear that other areas such as Bijapur which is located on Jagdalpur-Bijapur-Bhopalpatnam road will also gradually be converted in favour of dairying activities.

Out of the total female cattle and buffalo population it is estimated that 2.8 lakh animals fall in breedable category. Due to non-availability of age specific data for determining the outgoing number from this category on account of age and other infirmities and incoming number of fresh animals into this category from heifers, it has been assumed that incoming and outgoing animals will cancel each other and the breedable stock would remain intact. The number of breedable cows is estimated to be 2.6 and that of buffaloes 0.2 lakh. It is for this category of milching cattle that breed improvement programme has to be taken up with a view to improving the yield of milk and gradually replacing the stock with improved animals. Presently, the cattle of the area is of non-descript breed except in the southern sub-region, especially Konta and Sukma development blocks, where ongole breed of cattle is being reared by the people. However, the cattle is mostly reared for draught and less for the supply of milk. In the northern parts of the district cattle do not conform to any specific breed and have very poor milk yield. There is no regularly recorded data on milk yield either for cow or buffalo for the district. However, attempts have been made to estimate milk production on the basis of estimates arrived at in 1975-76.



These estimates are not representative for the district but they are the only source to calculate milk production for the district. The production so calculated may be on a slightly higher side but it will give some idea of the extent of present availability of milk in the district. Based on these estimates and taking into account seasonal variations in the yield factor the daily yield per animal in milk comes to about 0.646 kg. for the cow and 1.6 kg. for the buffalo. This yield estimate is further reduced to 0.399 kg. for the cow and 1.07 kg. for the buffalo if total milch cattle is taken into consideration for the calculation. It is felt that estimates should be based on the strength of total milch cattle instead of milking cattle only since it will represent the dynamics of the situation by averaging the contribution of both categories of cattle during the year. Accordingly, daily milk production comes to about 1,28,526 kg. for the district which makes per capita milk availability of about 70 grams per day as against per capita average daily requirement of 200 grams for maintaining the required nutritional level. Even if the calculation should base on the number of cattle in milk the daily per capita average availability comes to about 93 grams which is also not sufficient to meet the requirement.

The existence of large number of inferior cattle in the district may be attributed to large scale in-breeding prevalent in the existing cattle population coupled with the lack of information regarding cattle development techniques and absence of cross breeding facilities. Equally important factor for this state of affairs is the quantum and quality of feed available to the cattle. The present stock of livestock is the product of environmental conditions wherein the majority of them are deprived of adequate nutritional intake. The minimum feed requirement for maintenance of the cattle is estimated to be equivalent to about 3 per cent of its body weight which for the cattle of the district has been assumed to be around 250 kg. Accordingly minimum per capita maintenance requirement of feed would be about 7.5 kg. per day consisting of 1.0 kg. of concentrates, 2.5 kg. per day fodder and 20.0 kg. green fodder which is equal to about 4.0 kg. of dry fodder. The

recommended weight of maintenance ration for different categories of cattle changes according to the need of the beast. Adult cows and non-working bulls/bullocks should have 1.0 kg. concentrates, 20 kg. green fodder and 4 kg. dry fodder. She buffaloes require 1.5 kg. concentrates in addition to 20 kg. green fodder and 4 kg. dry fodder. Working bulls/bullocks need 2.0 kg. concentrates alongwith 20 kg. green fodder and 4 kg. dry fodder. Cows and buffaloes in milk are required to be fed 0.5 kg. extra concentrates per litre of milk subject to a maximum of 4.0 kg. and 5.0 kg. respectively. The growing young stock of 1.5 to 3 years of age have to be given better feed for proper growth. The recommended weight of feed consists of 2.5 kg. of concentrates, 20.0 kg. of green fodder and 5.0 kg. of dry fodder. Thus, the ideal maintenance level feed requirement is higher and possibly beyond the capacity of tribal cultivators in general. However, minimum maintenance ration of 7.5 kg. dry matter is essential for all categories of cattle and should be made available to them for ensuring minimum efficiency. Based on these assumptions the requirement of fodder and concentrates have been worked out. It is estimated that about 2.8 million tonnes of dry fodder, 3.6 million tonnes of green fodder and 0.5 million tonnes of concentrates would be needed for the maintenance the existing cattle of the district. The demand converted into dry matter equivalent would be around 3.5 million tonnes. The demand of green feed from tree crops which is generally for goats and sheeps is not included in this estimate. The pattern of cattle feeding is free grazing stall feeding is hardly practised. In such a situation it is difficult to know whether the cattle is over grazed or under grazed. Further, the area does not have a year round grazing capacity. The effective grazing season does not extend for more than four to five months in a year. During the grazing season only the cattle get maintenance and production ration since the nutritive value of the green material is sufficient to meet the demand to a great extent. The need of cultivated fodders in the green or conserved state, concentrates and other supplemental feeds is therefore great during the non-grazing season. The estimate of the availability of fodder thus assumes importance but there is no specific study for the district or reliable data for estimating the fodder supply. However, attempt has been made to estimate total fodder availability on the basis of averages

thrown up by grazing productivity research and available grain fodder ratio. For purposes of fodder estimation the areas under barren and uncultivable land, cultivable waste lands, permanent pastures and grazing lands, protected forest lands and old fallows have been considered. Crop residues of Jowar, Maize, Wheat and Paddy have also been taken into account. However, Reserve Forest area and fodder tree crops have remained excluded from these estimates. It may be mentioned that fodder tree crops are almost insignificant in terms of area. It is estimated on the basis of these data that total annual fodder availability in the district is 2.15 million tonnes which is short by more than one million tonnes as compared to the total demand for the existing level of cattle. The inference that the cattle of the district is severely underfed is obvious.

### **Poultry**

Poultry farming is common to all tribals and is practised in all areas of the district. Poultry are used for occasional food but generally is kept for ceremonious events and sacrifices. Eggs are not consumed and are hatched. Poultry, generally, do not provide a market to the tribal since they are neither sufficient in number nor belong to improved and healthy variety. In times of economic distress they provide immediate economic relief. Tribals, however, are very fond of cock fight and it is a popular sport in hat and fairs. They prepare their cocks for this purpose admirably. There is no organised feed system for the poultry and they are left to fend for themselves around their habitations.

Poultry population increased by 25.9 per cent during 1972-82 decade giving average annual growth of about 2.6 per cent. The distribution of poultry in various parts of the district follow the general pattern of cattle distribution. The main concentration of poultry to the extent of 56.8 per cent of the total is in central parts and highest in Jagdalpur tehsil followed by Kondagaon. Southern parts share 26.2 per cent with highest in Dantewara tehsil followed by Bijapur. The remaining 17.0 per cent are in northern parts with highest in Kanker tehsil.

Ducks are concentrated in Konta tehsil in the south followed closely by Jagdalpur tehsil in the centre.

## Goat, Sheep and Pigs

There were 4,16,786 goats, 17,146 sheeps and 1,06,517 pigs in the district in 1981-82. Goats are reared for sale and food while pigs are exclusively meant for meat supply. However, their per capita availability is so poor that they can hardly suffice for providing nutritional levels to the people in general. Goats and pigs are fairly well distributed in different parts of the district. The density of goats is highest in Konta and that of pigs in Dantewara.

The development programmes carried out during various Five Year Plans, so far, can be classified under the following heads :-

- 1) Animal Health
- 2) Development of Livestock
- 3) Development of Poultry
- 4) Development of Goaterly
- 5) Development of Piggery, and
- 6) Development of Fodder

The Veterinary set-up in the district has been strengthened in recent years to look after the animal health and to upgrade the present stock by introducing new breeds. At present one veterinary health care institution is working for 17,840 heads of livestock. Arrangements have been made for checking and treatment of clinical contagious diseases. Facilities for the protection of improved and cross breed calves against foot and mouth disease have also been created.

For improving the breed of the cattle facilities for artificial insemination and natural service have been created. Systematic attempts were made for improving the indigenous breed of cattle of North Bastar with Haryana, Sahiwal and half breed Jersey bulls. Facilities for breeding with Ongole bulls have also been provided. At present improved breeding facility is available for 82,000 cows as against 2.8 lakh of breedable cows.

Efforts have also been made for improving the egg laying capacity of the local birds. Cocks of improved breed were supplied on exchange basis, eggs were given for hatching and backyard poultry units were also supplied. The programme of mass vaccination against Ranikhet

is a continuing feature. Steps have also been taken to preserve the local breed 'Aeal' which the tribals raise for game.

There is ample scope of goat development for bringing improvement in the economic conditions of tribals within a short span of time and with relatively low investment. During the previous years Black Bengal and Jamunapari bucks were introduced with good results. Goat breeding centres have been established at hospitals and dispensaries for providing breeding facilities.

During the past years steps were taken to introduce White Yorks hire breed of pigs. Boars were exchanged and trics were supplied.

Schemes for popularising fodder production have also been implemented. Subsidies were given for fodder plots. Chaff Cutters were supplied on 50:50 cost subsidy basis to encourage improved feeding practices.

#### Veterinary Organisation

There are 36 Veterinary hospitals, 58 Veterinary dispensaries and 13 Veterinary aid centres in the district. One mobile unit and seven ambulatory clinics are also functioning for checking contagious diseases from neighbouring areas. Two quarantine stations and one follow-up unit have been set up under Rinderpest Eradication Programme. A disease investigation laboratory has also been set up in the district. One Ranikhet eradication unit is also working.

For the development of cattle, one unit under Intensive Cattle Development Programme, one unit under Controlled Cattle Breeding Programme, two Artificial Insemination Centres, one Key Village Block, and 42 Cattle Breeding Extension Units are functioning. The Intensive Cattle Development Programme established at Jagdalpur has facilities for insemination with exotic semen. Breeding facilities with Ongole breeding bulls have been provided at Bijapur. Natural services are also provided for improving the stock.

One farm has been established at Kondagaon for improving the egg laying capacity of local birds and one farm is working at Jagdalpur for producing cross breed birds. One pig breeding farm has been set up at Bastar with pure white yorkshire breed. There are 39 centres which provide

breeding facility for goat development.

One Veterinary Field Assistant Training Centre is also working at Jagdalpur for training the tribal candidates.

At present one veterinary institution is serving 18,000 heads of livestock. The improved breeding coverage has been provided for about 82,000 cows. The introduction of new breeds of Cattle, poultry, pigs and goats under the individual beneficiary oriented programmes have created awareness in the tribal population regarding cattle management and they now evince willingness to participate in livestock development programmes.

## 2. Approach and Strategy

The foregoing analysis of livestock situation in Bastar indicates that livestock development should be attempted in three main directions, viz., improvement in the quality of cattle, its health and its nutritional standards. The tribal people in the area at present give more emphasis on rearing the cattle for draught purposes. This emphasis has to be continued in future development efforts since dependence on cattle power for agricultural operations and other allied activities is not expected to decrease in the near future. There is also a likelihood of sizeable increase in development functionaries and other workers in the district during the Seventh Five Year Plan. These people in addition to the existing urban population will create a ready market for milk and milk products on a larger scale than what it is today. Further, the prime object of development strategy is to increase the incomes of the tribal people preferably through a chain of such economic activities which are functionally related to their main economic pursuit. Cattle rearing for purposes of dairying activity is one of the important subsidiary activities related to agriculture which is capable of increasing incomes of farmers or whole time dairymen in the short run and substantially in the long run. Notwithstanding the fact of non-consumption of milk by tribal people as well as their disinclination to milk their cows, taking up of cattle development programme with a view to augmenting milkyield is indicated by the wide acceptance of buffaloes for milk supply in certain areas of the district. If the premise that tradition of non-consumption

of milk among the tribals emerged basically on account of poor milk yields their cattle then it can also be presumed that given time and proper extension services for health awareness the tribals will also come round to consuming milk particularly to supplement the diet of their children for covering up protein deficiencies. The situation of dwindling free availability of game in the forest is a factor which can be utilised to convince the tribals with regard to the utility of milk in absence of regular meat supply. It has however to be attempted with caution and without apparent insistence. Nevertheless, breed improvement is a programme that has to be included in any scheme of cattle development. In Bastar this programme should be taken up in areas where people have already taken to dairy activity and for the rest of the district appropriate infrastructure should be created so that breed improvement programme could be taken up gradually. It is suggested that genetical improvement can be achieved by grading up these cattle with Sahiwal, Red Sindhi, Ongale proven bulls and cross breeding with Jersey bulls to obtain 50 per cent Jersey and 50 per cent zebu.

Breed improvement of cattle is basically oriented to augment the supply of milk but it does not fulfil the twin objective of providing cattle for draught. Improved breed bulls are not as efficient in the field as the local bull both on account of body formation and low resistance level due mostly to climatic and material conditions of the area. The physique, stature and humplessness of the animal would require modifications in agricultural implements and at the same time would increase feeding costs. It has however been suggested that first generation bulls may be used in agricultural operations with identical efficiency. In case of cows maintenance costs would increase which however can be met out of the increased milk yield but they will require more fodder and concentrates to sustain themselves and to remain profitable. This situation will further deplete the fodder supply to the existing stock of cattle. With every increase in the number of improved cattle existing stock will be rendered surplus. Further the cost structure for maintaining improved cattle would deprive poorer people in two ways; they will not be able to afford improved cattle on account of costs and their

own stock would be less serviceable due to reduced availability of fodder. The programme should therefore be designed to meet effectively this situation. It would therefore be advisable to adopt an integrated programme aiming at effecting controlled breeding in the local cattle, segregation of improved cows from the common herd, complete breeding ineffectiveness in unimproved bulls in areas covered by improved cows and a change in the grazing culture.

Cattle improvement programme would bring increased pressure on the existing fodder supply which is already deficit. Feeding of cattle rendered surplus on account of increase in the improved cattle would reduce in all probability the supply of fodder for improved breed. The existing facilities for improved breeding is capable of covering 82,000 cattle. By the end of Seventh Plan it has been proposed to create a potential capable of covering 2.5 lakh breedable cattle. Unless something like herculean effort is made to improve fodder supply position or some drastic action to reduce the number of local cattle population is taken, per capita fodder availability will be reduced to alarmingly low level. It is estimated that improvement in the cattle stock without reducing the strength of non-descript cattle will generate an additional demand of 0.8 million tonnes of fodder during the Seventh Plan period. The district already has a fodder deficit of about 1.10 to 1.30 million tonnes per year and green fodder becomes unavailable soon after the cessation of monsoon.

A realistic view regarding increase in grazing areas would suggest that large additions to the existing areas are not possible in view of the likely pressure on land both for cultivation and horticultural crops. In fact, existing pastures and grazing lands would be the first casualty when additions to the cultivated land would be required. In such a circumstance alternate strategies for raising fodder crops shall have to be framed. It may also be emphasised that reliance on dry coarse fodder would be misplaced for supplying food to the milking or working cattle particularly when the emphasis is on increasing milk yield. Such fodder contains too little protein. The minimum nutritive ratios of the ration for milk production should not be greater than 1:10. Any fodders,



such as rice and wheat straw have nutritive ratios of over 1:40 which obviously can not be suitable for milk production. Grasses on the other hand have better nutritive ratios. The fodders of outstanding value are the leguminous crops which have nutritive ratios of 1:4 to 1:6 and therefore most suitable. It would be apparent that the situation creates a paradox; the area under grazing lands cannot possibly be increased while grasses and legumes are the best source of nutrients to the animals. The problem can be solved to a great extent by attacking it from all conceivable angles. Surpluses of green grasses can be silaged during the season to be used subsequently. Fodder tree crops can be grown as part of horticulture programme since tree leaves can also provide maintenance ration although their protein have low digestibility coefficient. Crops like maize, jowar and gram can be encouraged to be grown extensively since they provide high quality fodder and nutrients to animals. These efforts notwithstanding grasslands development will have to be taken up on a large scale on areas outside the acreage under agriculture. Cultivators having bigger operational holdings can be persuaded or can be made to cultivate fodder crops on a certain fixed portion of their holdings.

The district has hot humid climate in which ectoparasites like flies, mosquitoes and tick flourish. They are the source of such protozoan diseases as babesiosis, thallemiosis and trypanosomiasis which are quite common. Abortions in cows, buffaloes, sheep and goats are also commonly observed and may be due to infectious diseases like brucellosis, listeriosis etc. Other diseases prevalent in Bastar are anthrax, haemorrhagic septicaemia, black quarter and general foot and mouth diseases. The causes for these diseases are to be investigated fully and remedial measures to prevent them from occurring have to be taken. Cattle also suffer from liver fluke infection and it is found even in sheep and goats. Ranikhet occurs commonly to poultry and affects birds of all ages and breeds. Preventive vaccination against this disease has to be popularised by seeking cooperation from the people. Efforts in this direction have already been initiated and veterinary hospitals and dispensaries have been opened at various places in the district. There is need to introduce more such institutions in the area. Owing to large area and scattered villages it is felt that mobile

dispensaries would serve the cattle in a better manner and would also create awareness in the people regarding the health of their cattle.

The task of improving the breed of cattle, protecting them from diseases and providing them with nutrients is certainly difficult particularly in view of large coverage of area and tribal population. The departmental set up has recently been strengthened and it is hoped that with increased effective implementation of various health and development schemes some improvement will be visible in the prevailing livestock situation. With a view to organising cattle development programme, dispensation of medicines and other livestock health care techniques on a massive scale according to the need of the area following programmes are proposed for the Seventh Five Year Plan.

### 3. Plan Proposals

#### Animal Health

##### (a) Veterinary Aid Centres

At the end of Sixth Five Year Plan there would be one veterinary institution for every 17840 heads of cattle. The National Council of Agriculture has recommended that there should at least be one veterinarian for every 10,000 cattle units. This recommendation does not appear to hold good for the conditions obtaining in Bastar. It may need modification since in case of Bastar livestock density per sq.km. is only 71. Looking to the spatial dispersal of settlements the provision of one veterinarian for 2500 cattle units in the southern part and 5000 cattle in the northern parts of the district appear to be an appropriate norm for Bastar. Accordingly 253 Veterinary Aid Centres are proposed to be established during the Seventh Plan. Each centre will be manned by a Veterinary Field Assistant with one Attendant and where basic facilities for diagnosis, treatment and preventive inoculation against contagious diseases will be provided to the cattle of the area. These Veterinary Aid Centres will be established in the following blocks :

Region	Development Blocks	No. of Centres
1	2	3
North Bastar	1. Charama	4
	2. Sarona	4
	3. Kanker	5
	4. Bhanupratappur	6
	5. Durgkondal	5
		<u>24</u>
West Bastar	6. Koilibeda	8
	7. Antagarh	4
	8. Keshkal	5
	9. Baderajpur	7
	10. Orchha	8
	11. Narayanpur	4
		<u>36</u>
Central Bastar	12. Pharasgaon	5
	13. Makdi	6
	14. Kondagaon	4
	15. Bastar	5
	16. Bakawand	5
	17. Jagdalpur	8
	18. Tokapal	9
	19. Lohandiguda	10
	20. Darbha	9
	21. Bastanar	11
South Bastar	22. Geedam	11
	23. Bhairamgarh	11
	24. Bijapur	11
	25. Bhopalpatnam	11
	26. Usoor-Awapalli	11
	27. Dantewara	11
	28. Kuakonda	11
	29. Katekalyan	11

1	2	3
	30. Chhindgarh	11
	31. Sukma	11
	32. Konta	11
		<u>121</u>

Establishment of these centres in the above break-up would meet the demand of both area and cattle population. There are already 13 such centres working in the district but they have not yet been provided with cattle attendents. It is also proposed to provide these existing centres with one cattle attendant each for assisting Field Assistants in performing their function more efficiently.

**(b) Mobile Veterinary Unit**

The proposed Veterinary Aid Centres would require constant supervision and guidance in matters of disease control and animal health programme. With a view to meet this requirement speedily and timely it is proposed to provide one Veterinary Assistant Surgeon in each of the 32 development blocks and assigned the function of visiting every veterinary aid centre in his jurisdiction at regular intervals. As such a mobile veterinary unit is proposed to be established at development block level. The unit will consist of a Veterinary Surgeon and an attendant. A motor cycle with a mobile kit will be given to each surgeon.

The surgeon will supervise the work of all the VACs in the block and will also attend to the veterinary extension work.

**(c) Establishment of Checkposts**

Cattle of the district are exposed to extraneous influences on account of animals from the adjoining states of Orissa, Andhra Pradesh and Maharashtra migrating temporarily to this district for grazing and marketing. Thus, the livestock of the district becomes liable to contract contagious diseases, which are at times serious. For keeping a check on the spread of such diseases two checkposts at Bhopalpatnam and Dhanpunji are working in the district. It is proposed to establish

3 more checkpoints at Bakawand, Pakhanjore and Golapalli which are located on cattle routes coming from Orissa, Maharashtra and Andhra Pradesh. These checkpoints will be provided with the services of one Veterinary Assistant Surgeon and two Field Assistants alongwith other complementary assistance of man and material.

#### **(d) Disease Investigation and Diagnostic Facilities**

Disease control and health care of cattle on such a large scale necessitates proper facilities for disease investigation and diagnosis with a view to taking up necessary steps for their prevention and control. The large size of the district does not allow quick investigations, immediate laboratory tests and timely communication of test results to the field. Besides, a programme of cattle breeding of considerable size is being proposed alongwith intensive poultry and piggery development in the district. It is felt that one existing disease investigation and diagnostic laboratory will not be able to meet the total requirement of the district particularly in view of the large Cattle Development Programme being taken up in hand. It is therefore proposed that one more such laboratory may be established at Kanker in the north of the district with proper facilities. The existing laboratory too requires to be equipped adequately and it is proposed to provide it with latest diagnostic equipments.

#### **(e) Foot and Mouth Disease Vaccine**

Cattle development programme envisages to bring breedable cows under the coverage of frozen semen insemination techniques. These cows and the cross breed calves produced as a result of this programme will need protection against foot and mouth diseases. The vaccine required to effect this protection is available in the market but the tribals will not be able to purchase it owing to the costs involved and also on account of none too easy availability of the vaccine in the district markets. At present the vaccine is supplied to the beneficiaries at 50 per cent subsidised rates. Looking to the special conditions of tribal beneficiaries it is proposed to administer the vaccine on 100 per cent subsidy basis. This scheme will operate in areas along the Charama-Jagdarpur and Kanker-Bhanupratappur routes which are used for milk collection.

### (f) Medicine Supply

Tribal people are conversant with the importance of and need for looking after the health of their animals but owing to poverty and lack of facilities for health care in the area they have left the cattle to develop resistance and adapt to environmental vagaries to the best of their natural ability. Any programme of cattle development presupposes the existence of basic infrastructure and its efficient functioning. The whole exercise of cattle development would come to a naught if beneficiaries are not helped to maintain a certain required level of health of their animals. Therefore, keeping in view the poor economic circumstances of the tribals it is proposed to supply medicines for their cattle free of cost. Hence a proposal is being made for the purchase of medicines and supplying them to various institutions such as veterinary hospitals, veterinary dispensaries, veterinary aid centres, Ambulatory clinics and district level hospitals. From these centres the tribal will get his requirement as and when necessary.

### Cattle Development

#### Dry Dairies

Dairy activities, as has been said earlier, cannot possibly be taken on a large scale in the district since most of the tribals neither milk their cows nor use milk as part of their diet. However, urbanisation of certain areas, establishment of Bailadilla iron ore exploitation project, induction of large number of development functionaries and initiation of industrial activities albeit in a small measure, have necessitated the production of milk in large quantities. It is also essential that tribals be encouraged to take up cattle rearing as an activity to better their economic condition in addition to providing themselves animals for use in agricultural operations. It would further be desirable to convince the tribals regarding the importance of milk in human diet and persuade them to start its use for improving the nutritional standards of their children. With these objectives in view it is proposed to organise dry dairy cooperative societies in certain selected areas with the hope that other areas will be benefited by the experience of tribals with dry dairy units.

The concept of a dry dairy is to establish infrastructure for creating potential for milk production after a certain period of time and during which period extension methods would create awareness among tribals about and utility of dairy activities as income generating proposition. The psychological preparedness of the people thus synchronises with the potential formation in the area. Dry dairy units will be organised in a phased manner first on the established milk routes i.e., Charama-Jagdapur, Kanker-Bhanupratappur, Hatkondal-Bhanupratappur and Bhanupratappur-Narayanpur routes. The members of the cooperative societies will be given all inputs such as artificial insemination services, provision of health care, animal nutrition through improving and controlling fodder and cattle feed. Initially the approach would first be made to roadside villages since roads play an important role in sustaining dairy units by providing them easy access to markets or allowing milk collection agencies to collect the produce of the area timely. Subsequent efforts would be directed towards villages situated not very far off from the road. In the meantime it is expected that suitable network of roads would be created in the area.

A dairy cooperative society is considered viable if it can supply 60 to 75 litres of milk regularly throughout the year. One cooperative society is designed to cover two or more villages and thus it is proposed to organise 150 such cooperative societies covering about 15000 tribal households spread over about 300 villages. It is estimated that nearly 27000 breedable cows will be provided facilities of artificial insemination with frozen semen and thus about 12 per cent of breedable cows will be replaced by cross breed cows. It is further estimated that milk procurement programme would be started from the sixth year after the initiation of the activity. Keeping this in view the establishment of dairy plant and chilling centre has not been proposed to be established during Seventh Plan period.

It is further proposed to involve tribal people not only with producing milk but with the dispensation of technology as well. Tribal youth of the area will be trained as a lay inseminator and he would also be trained in running the cooperative society. Thus, 150 tribal

youth of the area would be trained and employed as lay inseminator cum secretary of dry dairy cooperative societies.

Cross breed calves produced as a result of cattle improvement programme in the area would require higher nutritional levels to be able to exhibit their improved character within the designed time frame of the scheme. Tribals being poor would not be able to maintain the improved cattle if they are left to manage for themselves. It is for this reason and to ensure proper take off of the entire project, a provision for subsidising full nutritional requirements of female calves is being proposed. During the Seventh Plan period 500 female calves would be covered at a rate of 100 calves per year.

#### **(b) Controlled Cattle Breeding Project**

In addition to the development of cattle for improving milk supply it is also proposed to take up Controlled Cattle Breeding Projects in 14 development blocks for developing the local breed of improved bullocks for agricultural purposes. These development blocks are Konta, Usoor (Awapalli), Bhopalpatnam, Sukma, Chhindgarh (Tongpal), Kuakonda, Katekalyan, Dantewara, Geedam and Bhairamgarh of south Bastar, Darbha and Bastanar of central Bastar and Orchha and Koilibeda of west Bastar. Each block will have 25 bull centres and two bulls will be made available at each centre for natural services. The post of one VAS will be created at block head quarters for supervising the programme who will be assisted by three Veterinary Field Assistants. The centre will be looked after by one attendant. The programme involves breeding of local cattle with improved Indian breed by providing natural services. It is expected that 70,000 breedable cows will be covered under this programme during the Plan period.

#### **(c) Fodder Demonstration Plots**

Fodder requirement for improved cattle shall have to be managed. It has already been pointed out that fodder supply in the district is short of the demand. However, improved cattle cannot be allowed to go waste for want of fodder. It is therefore essential to persuade cultivators to take up fodder cultivation for meeting the demand of their



improved cattle. It is proposed that some 7500 beneficiaries in the area may be encouraged to provide one fourth of an acre in their holdings for developing demonstration plots of Kharif and Rabi fodder crops. These beneficiaries will be given full costs as subsidy for raising fodder crops. However, this subsidy would be in kind i.e. the beneficiaries will be provided with proper seed, root, stem cuttings and saplings as the need may be. They will also be provided with adequate quantity of manures/fertilizers. The scheme is proposed to be taken up in 19 development blocks out of which 10 development blocks would be in South Bastar, 6 in Central, 2 in Western and 1 in Northern Bastar.

#### **(d) Pasture Development**

Pasture development is an integral part of cattle development. For a successful and profitable animal husbandry programme it is necessary to make available nutritious grasses to the progeny. Otherwise too, pasture development is absolutely necessary for providing all essential food to the cattle in general particularly when general nutritional level of the existing cattle stock is extremely poor. With a view to providing nutritious fodder to the animals, it is proposed to take up cultivation of certain grasses of nutritive value in the district. The scheme is proposed to be carried out in Jagdalpur, Bastar, Pharasgaon, Kondagaon, Keshkal, Kanker, Charama, Bhanupratappur, Koilibeda and Orcha development blocks. It is further proposed to implement the scheme with the help and in close cooperation of Forest Department. Pasture with selected grasses will be developed on a 100 acre plot in each of these blocks. These plots will be stocked with fresh improved seed, manured and trench fenced. The fodder so produced will be given to farmers participating in cattle development programme.

#### **(e) Establishment of Jersey Cattle Breeding Farm**

A programme for producing cross breed with Jersey Cattle is proposed with a view to increase the general milk supply in the district and to meet the demand of breeding bulls. The programme will be taken up in selected pockets. Accordingly, one Jersey Cattle Breeding Mixed Farm is proposed to be established at Kanker. In addition to cattle, small units of goatery, piggery, poultry and duckery will also be maintained at the

farm and facilities for the training of tribal couples for 3 months in animal husbandry practices will also be provided. The scheme is expected to benefit 500 tribal couples.

**(f) Establishment of Mixed Farms**

Two mixed farms are proposed to be established at Narayanpur and Sukma. Tribal couples will be trained at these farms in improved animal husbandry practices. Cows of recognised Indian breeds will be kept at these farms for the production of bulls and milk. Small units of dairy, goatery, piggery, poultry and duckery will also be maintained at these farms. Nearly 1000 tribal couples will be trained during the Plan period. One couple will be trained for 3 months. The couple will be paid Rs. 300.00 per month as stipend.

**(a) Poultry Development**

**Strengthening of existing and Establishment of New Poultry Farm**

Poultry is popular among tribals of the district. Although they do not consume eggs but they keep poultry for their use at religious and ceremonial occasions. They sell their birds also when they need money. Keeping these facts in view it is felt that poultry development programmes can be taken up in the district with encouraging results. The demand for eggs and table birds is likely to increase further. However, tribals in general will have to be persuaded to sell their eggs specially tribals in interior rural areas. Two poultry farms are already working at Kondagaon and Jagdalpur. It is proposed to increase the strength of layer birds to 2000 on these farms. One more poultry farm is proposed to be set up at Bhanupratappur with a strength of 2000 layer birds. Like poultry farms at Jagdalpur and Kondagaon the farms at Bhanupratappur will produce cross breed birds. These farms are expected to boost up the production of poultry birds on large scale by providing chicks for distribution among tribals.

**(b) Chick Rearing Centres**

Production of cross breed birds and distribution of chicks to different tribal areas involves establishment of appropriate institutions at various convenient centres. Poultry Farms at Jagdalpur, Kondagaon and

the proposed farm at Bhanupratappur will produce colour cross birds. However, tribals have also to be given chicks for rearing so that they may have their own improved poultry unit and could produce eggs for sale. With a view to generate such a capability in tribal households it is proposed to supply three months old chicks to beneficiaries under various poultry development programmes. It is proposed to distribute, 20 to 25 chicks to each beneficiary. For meeting the needs of chicks and with a view to cause convenience in distribution, it is planned to set up chick rearing centres at 4 Project Headquarters namely Bhanupratappur, Kanker, Dantewara and Narayanpur. Chicks hatched at different farms will be reared at these centres for 3 months and then distributed to beneficiaries for further care and rearing. Each centre will have the capacity of rearing 1000 chicks at a time.

**(c) Establishment of Poultry Key Villages**

It is further proposed to select 100 villages in Charama, Kanker, Bhanupratappur, Narayanpur and Dantewara development blocks to function as Key Poultry Villages. The objective of identifying these villages is to gradually introduce improved birds in the area and to practically train tribal people in rearing chicks on scientific lines. They will also be expected to change feeding pattern of their poultry with a view to developing healthy birds. It is proposed to select five tribal households from each village each year for being supplied with chicks. They will be given 20 to 25 three months old chicks free of cost. They will be given feed free of cost for the chicks for 3 years. They will also be helped in providing proper dwelling houses for poultry and the costs will be borne by the Government. One key village will have 500 birds each.

**(d) Poultry Production and Development Programme**

Poultry development not only envisages the establishment of infrastructural facilities for the production of eggs and birds but also proper linkages with the supply of inputs and marketing of the produce. Therefore, supervision and coordination in the following aspects is of utmost importance.

(1) Organisation of poultry development activities, (2) Supply of poultry feed. (3) Health Coverage; and (4) Marketing of eggs and table birds. With a view to organising properly these activities, it is proposed to create proper organisation in the two projects at Jagdalpur and Kanker for looking after poultry development, health care and marketing aspects of the poultry development programmes.

#### **(e) Ranikhet Eradication Programme**

Poultry development particularly when it is envisaged to involve tribal households should also take care to provide protection from diseases specially Ranikhet which cause much damage. There is only one Ranikhet Eradication unit working in the district which is located at Jagdalpur. The unit has got 25 vaccinators. Looking to the size of the district, it is felt that there should be three more such units for having an effective control over this deadly disease. These units are proposed to be located at Kanker, Charama and Dantewara. Each unit will have 50 vaccinators.

#### **Establishment of Duck Farms**

The district has a background in duckery. There are 22391 ducks in various parts of the district. It is felt that duck development can also be taken up in the district. Therefore, a duck farm with 500 ducks is proposed to be established at Dantewara. Nearly 50 thousand ducklings will be hatched annually at this farm and will be distributed to tribals under various schemes. This duck farm will go a long way in strengthening the duck rearing activity with which tribals are already familiar.

#### **Duck Development Programmes**

With a view to popularise the duck rearing programme, five villages are proposed to be selected in watershed areas in each of the five blocks :-

(1) Bastar (2) Jagdalpur (3) Konta (4) Bhopalpatnam, and (5) Lohandiguda. Twenty farmers will be selected in each village and each farmer will be given 12 three months old ducks - 10 female and 2 male free of cost. In all, the programme will benefit 500 families. Half of the number i.e. two hundred and fifty families are proposed to be covered in the first year of the Plan and the remaining 250 families will be brought under this scheme

in the third year of the Plan. In addition to 12 birds, each beneficiary will be given a Mach Type of thatched house for birds and four quintals of feed per year for three years free of cost. One unit of 12 birds is expected to fetch Rs. 2400.00 to one family in three years by way of eggs and table birds.

#### **Piggery Development**

Pig rearing in Bastar is quite common. There are about 106517 pigs in the district. There is already a scheme of distribution of birds and providing boar on exchange basis which is being implemented in the district. It is proposed to continue it. One pig farm is also at Jagdalpur. During the Seventh Plan it is proposed to distribute 1200 pig units consisting of 3 female and 1 male to tribal beneficiaries. The scheme is proposed to be implemented in Charama, Kanker, Bhanupratapur, Koilibeda, Antagarh and Narayanpur development blocks.

#### **Construction of Institutional Buildings and Residential Quarters**

Veterinary and Animal Husbandry Programmes are mostly based in rural areas. There is a great shortage of accommodation both for the institutions and residences of functionaries. Most of the institutions are located in rented huts which do not provide adequate accommodation for working nor for proper storing of medicines and other equipments. Similarly development functionaries are also not available at times. Owing to these circumstances it has been observed that functionaries posted in the district do not like to stay at the place of their posting. Lack of proper living quarters and substandard working conditions affect the level of general efficiency. It has therefore become necessary to construct institutional and residential buildings. While these buildings are necessary for efficient working of the staff it is however not necessary to construct these buildings with urban standards. They can be constructed with locally available material but they must provide proper space for working; for storing material and equipment, and close by, residential quarters. In fact these buildings should have all those basic necessary amenities which a urban dweller is accustomed to and which the development approach is aiming to provide to the tribals for changing their social and living habits.

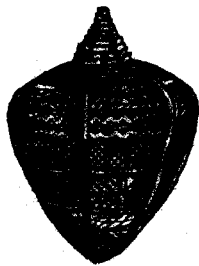
These simple but well planned buildings in rural areas will create an impact which no verbal communication can produce. Keeping in view these facts and circumstances it is proposed to take up construction of buildings for veterinary institutions as well as residential quarters

for the functionaries. While designing the building care should be taken that more than one institution complementary to each other in functioning should be accommodated in the same building. It is proposed to take up this massive construction programme in a phased manner and a provision of Rs. 196.00 lakh for this purpose is proposed for the Seventh Five Year Plan.

The cost formation of the entire Veterinary and Animal Husbandry development programme for the Seventh Five Year Plan would be as follows :

S.No.	Programme	Cost (Lakh Rs.)
1	2	3
1.	Cattle Development	
	(a) Organisation of dry dairy corporative Societies	75.67
	(b) Controlled Cattle Breeding	60.08
	(c) Calf Subsidy for rearing Cross bred calves	14.40
	(d) Subsidy for Kharif and Rabi fodder cultivation	7.50
	(e) Pasture Development	6.50
	(f) Establishment of Jersey Cattle Breeding Mixed Farm	86.00
	(g) Establishment of Mixed Farms for training	18.64
2.	Poultry Development	
	(a) Increase of strength of layer birds at existing poultry farms	70.00
	(b) Establishment of new poultry farms	70.00
	(c) Establishment of Chick Rearing Centres	80.00
	(d) Establishment of Key Poultry Villages	26.80
	(e) Ranikhet Eradication Programme	40.00
	(f) Duck Development	39.90
	(g) Poultry Production and Development Programme	60.00

1	2	3
3.	Piggery Development	
	Distribution of Pig Units	36.00
4.	Veterinary and Animal Health Care	
	(a) Establishment of Veterinary Aid Centres	142.75
	(b) Mobile Veterinary Units	34.32
	(c) Establishment of check posts	4.61
	(d) Establishment of Disease Investigation and diagnostic laboratory	6.00
	(e) Subsidy for Foot and Mouth Disease Vaccination	4.91
	(f) Provision of Cattle Attendants in Veterinary Aid Centres	2.50
5.	Construction of Institutional Hutments	195.00
		<u>1081.58</u>



## FISHERIES

### 1. General Review

In spite of vast resources of culturable water areas available in the shape of ponds, tanks, and irrigation reservoirs, measures for the development of pisciculture taken so far have been inadequate. Pisciculture has to ensure an increase in the production of fish for local consumption as well as for marketing so that the dietary imbalances prevalent among tribals are corrected and their economic conditions are ameliorated. Agriculture at present is not a whole time occupation for the tribals. Pisciculture is a suitable activity to be developed as a subsidiary occupation firstly because the tribals enjoy fish as part of their diet secondly, they are familiar with fishing activity and thirdly, because of the availability of the large culturable water areas.

Bastar district has vast water resources out of which distinct sites can be found for pisciculture. The water wealth assessment from the point of view of fisheries development can be divided into 3 parts, i.e., pertaining to natural river system, village ponds and, man made lakes.

#### Rivers

Bastar district has two major river systems, the Godavari and the Mahanadi. The Godavari system is more important since ninety three per cent of the district lies in Godavari Basin, and the rest seven per cent in Mahanadi Basin.

Indravati is the longest river of the district with a length of 372 km. It flows generally in westward direction across the district and after the confluence with its tributary Kotri, it takes a southward course and meets Godavari via Bhopalpatnam in the South. Sabri river is another important tributary of Godavari river. The total length of this river in the district is 180 km. It also flows from east of the district and then takes a southward course to meet Godavari between Baddigudam and Konaram. It is the main river of Konta Tahsil.



The Godavari which receives most of the drainage from the district only forms the boundary between the States of Madhya Pradesh and Andhra Pradesh and its total length in the district is approximately 24 km. The total length of Mahanadi river in the district is about 64 km. and it is confined to Kanker Tehsil.

Other important rivers of the district are Markande of Jagdalpur tehsil, Narangi, Markandi, Bhawardehi, Chheribeda, Boarding Guda of Kondagaon Tehsil, Talopari, Vorari, Kokar, Darawagu, Chintawagu, Chintawag of Bijapur Tehsil, Dankani, Sankhani of Dantewada Tehsil. Nibra, Bair, Kotri, Marin of Narayanpur Tehsil, Chargaon, Dongri of Antagarh tehsil, Sendar, Doodh, Mahanadi, Toorinadi of Kanker Tehsil and Phool Gorani, Mayanger of Konta Tehsil.

#### Village Ponds

There are about 3330 village ponds, spread over in 27 blocks covering 8301 ha. under water area. The situation in Abhujmar, Bijapur, Bhairamgarh, Usoor and Bhopalpatnam blocks has yet to be ascertained. The block-wise details of water area available is shown below:

S.No.	Name of Block	Number of tanks	Area(in ha.)
1	2	3	4
1.	Jagdapur	182	345
2.	Darbha	43	35
3.	Tokapal	110	76
4.	Bastanar	9	5
5.	Lohandiguda	60	77
6.	Bastar	259	329
7.	Bakawand	209	198
8.	Dantewada	41	98
9.	Geedam	89	143
10.	Kuakonda	11	16
11.	Katekalyan	7	5
12.	Konta	21	100
13.	Sukma	12	28

1	2	3	4
14.	Chhindgarh	22	60
15.	Kanker	192	291
16.	Charama	211	528
17.	Sarona	245	4644
18.	Kondagaon	283	168
19.	Baderajpur	194	130
20.	Pharaggaon	215	162
21.	Keshkal	212	188
22.	Makdi	233	104
23.	Bhanupratappur	160	216
24.	Durgkondal	49	56
25.	Narayanpur	169	151
26.	Koilibeda	41	71
27.	Antagarh	49	77
Total :		3330	8301

### Irrigation Tanks

Presently 133 irrigation tanks/reservoirs spread over 26 blocks, covering an area of 9327.84 ha. at the full tank level have been surveyed. The productive water area of irrigation tanks/reservoirs works out to 5525.37 ha.. Blockwise position of irrigation tanks/reservoirs is as follows :

S.No.	Name of block	Number of tanks	Productive water area (in ha.)
1	2	3	4
1.	Bhopalpatnam	8	171.24
2.	Bijapur	5	61.52
3.	Bhairamgarh	2	23.39
4.	Usoor	2	29.48
5.	Kuakonda	1	5.42
6.	Dantewada	7	76.87

1	2	3	4
7.	Geedam	3	40.97
8.	Sukma	4	39.41
9.	Konta	5	24.19
10.	Bastar	9	111.51
11.	Bakawand	3	23.36
12.	Lohandiguda	4	47.07
13.	Tokapal	1	32.08
14.	Kondagaon	8	140.47
15.	Darbha	1	10.40
16.	Makdi	1	4.62
17.	Pharasgaon	6	35.33
18.	Keshkal	8	106.06
19.	Baderajpur	2	30.40
20.	Narayanpur	8	506.97
21.	Koilibeda	2	691.79
22.	Kanker	6	66.12
23.	Charama	10	178.09
24.	Antagarh	2	217.00
25.	Sarona	5	2539.35
26.	Bhanupratappur	20	312.26
Total :		133	5525.37

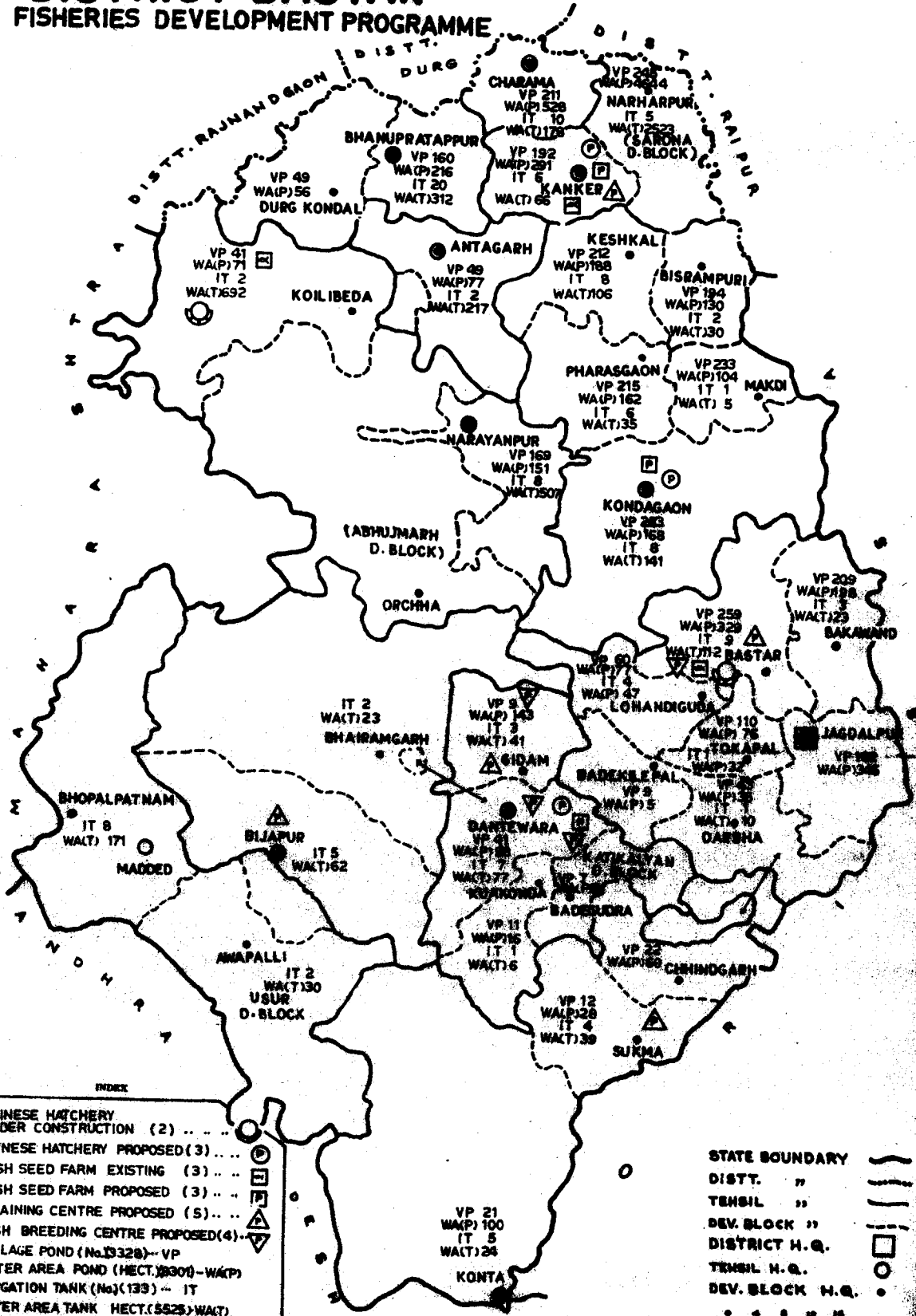
According to the information detailed above total productive water area in the district is estimated at 13,826 ha. However, the area under village tanks cannot be fully depended upon for pisciculture as water availability in some of them is purely seasonal and the ground is not suitable for pisciculture. Therefore, presuming that 25 per cent of the village ponds will not be available for pisciculture, the water area for village ponds which can be readily made available for this purpose is taken as 6200 ha. and thus the total availability of culturable area is reduced to 11725 ha. By the end of the Sixth Five Year Plan an area of about 4437 ha. of irrigation tanks is likely to be developed by the State Fisheries Department. Therefore, the potential available for development

would be 7288 ha. water area in which 6200 ha. would be under village ponds and 1088 ha. under irrigation tanks.

Fisheries Development activities in Bastar district were confined mainly to supply of fish to private pisciculturists and Gram Panchayats. In Bastar district these activities were initially taken up directly by Dandakaranya Project. The Samund Tank of Jagdalpur and two fish farms were established at Jagdalpur and Pakhanjore. The fisheries department however, commenced its activities from 1963-64 with the applied nutrition programme in the area. Subsequently, the activities increased and the development of Dudhawa reservoir was taken up along with Dudhawa irrigation tank. Samund tank of Jagdalpur tehsil and Moti Talab fish farm were obtained from Dandakaranya Project and the district was placed under independent charge of departmental officer. A riverine survey unit for the survey of fish and fisheries of Indravati River was set up in 1972-73. On completion of survey it was converted into a regular departmental unit in 1979-80. The district has been divided into two jurisdictions namely, South Bastar and North Bastar. These two divisions are responsible to look after fisheries development activities in all the seven Integrated Tribal Development Projects and other fisheries development activities. Pisciculture has gained popularity with the tribals in Kanker, Bhanupratappur, Kondagaon and Jagdalpur tehsils but, it has yet to develop roots in Konta, Bijapur and Dantewada tehsils in south Bastar. No doubt, the tribals are fond of fish and they go for any amount of effort to get one for their meals but, fisheries development as a major source for the supply of fish for their use has not been possible for the tribals particularly in south Bastar because of the lack of information regarding pisciculture, and ignorance of ways for multiplying fish through human efforts. The departmental activities of fisheries development and pisciculture are also presently limited to only such areas which are easily accessible and where the department can maintain and supervise fisheries activities.

Availability of quality fish seed is a prerequisite for the culture of fisheries. It is estimated that for a moderately ambitious programme of development of fisheries 240 lakh fry will be needed as fish

MADHYA PRADESH  
**DISTRICT BASTAR**  
 FISHERIES DEVELOPMENT PROGRAMME



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STATE BOUNDARY

DISTT. "

TENSIL "

DEV. BLOCK "

DISTRICT H.Q.

TENSIL H.Q.

DEV. BLOCK H.Q.

0 1 2 3 4 5

seed, while the present level of production is 90 lakh fry. Five fish seed farms at Kanker, Charama, Jagdalpur, Balinga and Pakhanjore have been constructed. One major reservoir, the Paralkot Dam and 23 minor irrigation tanks covering a production area of 557 ha., have been brought under the Intensive Reservoir Development Programme.

Fisheries development activities in the district as also in the State, were confined mainly, to the supply of fish seed to private pisciculturists and gram panchayats. It was only in 1976-77 that Tribal Sub-plan schemes were initiated under Integrated Tribal Development Projects. Till 1980-81, 65 ponds covering an area of 150 ha. were rendered suitable for fish culture. Improvements and repairs, such as deepening, desilting, dewatering, strengthening of bunds etc. were carried out in these ponds on cent per cent subsidy basis as village panchayats could not undertake these activities on their own because of their weak financial position. A rearing pond and a dry bundh were under construction and repairs and improvements of 38 tanks were in progress. Till 1982-83, 157 tanks were stocked with 74.39 lakh fry which approximately yielded 60.51 tonnes of fish. This yield partly was available for free distribution among tribals and partly to be used as income for gram panchayats.

In order to encourage individual pisciculturists to increase fish production from their existing ponds, 50 per cent of the fish seed is subsidised. Two types of training courses are being carried out by the department. One course is for tribal individuals and the other is for tribal couples. Each trainee is given 2 kg. of nylon twine, journey expenses and stipend for the training period. The trainees are trained in various techniques of fish culture, exploitation of fish, net making and mending etc. So far, 678 tribal individuals and 80 tribal couples have been trained.

Attempts have also been made to organise primary fishermen cooperative societies so that the tribal fishermen could work in an organised manner. The trained tribal men and tribal couples will be the members of such cooperative societies. Village ponds and irrigation tanks will be allotted to these societies on long term lease. Subsidies at varying rates for share capital, lease amount, fish seed and nylon

twine etc. will be given. Eight such primary societies are in the process of registration.

## 2. Approach and Strategy

Fisheries development as one of the main props for increasing the incomes of tribals and general economic development of the district would be possible only with the active participation of the people and village institutions. It may also be necessary for providing tribals with a regular and dependable source of nutritional component for their diet. Most of the tribals are engaged in agricultural pursuits out of which they are hardly able to meet their food requirement for the whole year. Their dependence on forests for supplementing their food resources has also been reduced. The state of agricultural development is still in its early stages and has not yet made the tribal, in general, self sufficient. Fisheries development can be taken up as a subsidiary activity in the beginning with a view to providing additional source of food to the people and subsequently additional source of incomes. Fisheries development programme is a simple, uncomplicated and viable proposition involving relatively smaller investment and capable of giving quick and substantial returns. It is admirably suited to the genius of tribals provided they could be equipped with necessary technology and given necessary inputs preferably free of cost for some time.

The potential for the development of fisheries is available in the district. At the end of the Sixth Plan about 7288 ha. of water area would be available for this purpose. Out of this area 6200 ha. belonging to village ponds is the potential which should be utilised for making fishery development activity acceptable on a large scale. These ponds whether belonging to the community or to private individuals should be stocked with fish seed. Panchayats and individuals should also be imparted knowledge regarding methods of tank management, feeding of fish and harvesting of fish crop.

The strategy adopted earlier for supplying fish out of the total yield of individual tanks may continue during the Seventh Plan as it appears to be the only feasible approach to popularise the activity among villages. Tribals being fond of fish as part of their diet would, in due course, cooperate in maintaining their ponds, and raising their yields by adopting better management techniques. It is also essential therefore to continue the training programme for those tribals and tribal couples who volunteer or are willing to be trained. However, it is the creation of a wider base among the people by imparting ideas and technology, that will ultimately succeed in making the programme acceptable and ensuring a proper response from the people. It is here that extension services are needed, which the department has not been able to provide, by a body of trained personnel since departmental approach often ignores vital inter-departmental linkages. A combined effort by Health, Fisheries and Co-operation departments can awaken people and make them aware of their resources in relation to their need. Extension is a highly ignored area and more so in Bastar where it is most needed. Till such a machinery is devised and made operationally active the department of Fisheries should take up the work of transferring the technology to the area, educating the people in the methods of fish rearing and extraction and organising them to market their produce advantageously.

The departmental efforts at developing fish rearing activities in the district has resulted in popularising it more in the northern sub-region of the district. The reasons for this success may be found in relatively easy accessibility to the interior areas and the background of the people coming from Bengal who have been rehabilitated in the area under Dandakaranya Project. In the southern sub region fish rearing does not form part of social milieu. The distribution of the tanks and water area under them according to survey results is much smaller as compared to the north. The survey has yet not been completed in Bijapur, Bhairamgarh, Usoor and Bhopalpatnam development blocks. The number of tanks and area under them is bound to increase after the survey but it will make very little difference since at present southern sub region has only about 7 per cent of the total surveyed tanks and about 5 per cent of the total water area under them. Northern sub region will always fare better,



given similar facilities to the people of the sub regions. In such a circumstance special efforts shall have to be made to enlist the cooperation of the people in southern sub region. The programme of improving, reclaiming unserviceable village ponds, subsidising fishermen, providing with equipment and organising purchases from them at reasonable prices shall have to be weighted in favour of the people in southern areas of the district.

### 3. Plan Proposals

Culturable water area covering about 11725 ha. is available in the district out of which 4437 ha. water area under irrigation tanks will be developed by the end of Sixth Plan. The potential available for development at the beginning of the Seventh Plan will be 7288 ha. water area with a distribution of 1088 ha. under irrigation tanks and 6200 ha. under village ponds. It is expected that more water area will be made available with the construction of new irrigation tanks during the Seventh Plan. Keeping these facts in view the following schemes are proposed for being taken up during the Seventh Plan period in the district.

#### **Improvement of Gram Panchayat Ponds**

The village ponds are very old and require improvement such as deepening, desilting, dewatering, strengthening of ponds guarding inlets and outlets etc., before they could be used for pisciculture. Gram Panchayats are financially weak and their capacity to undertake pond improvement works is extremely limited. It is therefore, essential that these improvements should be organised by providing full financial assistance from the Government.

Gram Panchayat ponds have recoverable area of about 6200 ha. It is proposed to take up improvement and development of about 4000 ha. during the Seventh Plan, and thus render them suitable for pisciculture. It will add an area of 800 ha. per year to the already existing culturable area.

#### **Stocking of Fish Seed in Gram Panchayat Tanks**

The scheme is designed to demonstrate pisciculture practices to

the villagers with a view to encouraging them for taking up fish culture activities of their own. Panchayat tanks that are readily available and the tanks made suitable for pisciculture after necessary repairs and improvement shall be stocked with quality fish seed and for this purpose per cent assistance from the Government will be provided. The quality seed, at the rate of 5000 fry/ha. water area, will be stocked in these Panchayat tanks. The cost per ha. is estimated to be around Rs. 225.00 and it is proposed to cover 2500 ha. water area under this scheme during Plan period.

#### **Development of Village Ponds**

It is proposed to bring 4000 ha. of village pond area under fish culture through cooperative societies. These ponds would be stocked at the rate of 5000 fry per ha. water area involving per acre expenditure of Rs. 225.00. The stocking would be done on the basis of full cost subsidy during the first year, 50 per cent subsidy during the second year and 25 per cent subsidy during the third year.

#### **Development of Reservoirs**

All irrigation tanks covering upto 40 ha. in area are proposed to be leased out to the Tribal Co-operative Societies. The development of reservoirs entails three distinct activities relating to reclamation, guarding of waste weirs and spill ways and then stocking them with fish seed.

#### **Reclamation**

It is proposed to reclaim one thousand ha. of reservoir basin area at the rate of Rs. 1000 per ha. The reclamation activity will include removal of forest trees, stumps etc.

#### **Guarding of Waste Weir/Spill-ways**

It is proposed to guard waste weirs of 100 tanks during the Plan period which will estimatedly involve about Rs. 0.20 lakh per tank.

#### **Stocking of Fish Seed in Irrigation Tanks**

Stocking of fish is proposed to be undertaken in 1000 ha. of water area of irrigation tanks during the Seventh Plan period.

### **Development of Riverine Fisheries**

Due to excessive fishing the riverine stock is fast depleting. In order to increase the fish production from the rivers as well as to introduce the desirable species it is proposed to stock 10 lakh fry annually in selected pools of rivers.

### **Production of Fish Seed**

The annual requirement of fish seed on full development of available water area would be about 240 lakh fry whereas the present level of production is only 90 lakh fry. There is a great potential for wet bundh breeding as well as for dry bundh breeding in the district. Two circular pool type (Chinese) Hatcheries are being established in the district. To further reduce the gap three more hatcheries are proposed during the Seventh Plan period.

### **Formation of Cooperative Societies**

Culturable water area of the order of 7288 ha. pertaining to irrigation tanks and village ponds would be made available for development out of which it is proposed to develop 1000 ha. under irrigation tanks and 4000 ha. under village ponds during the Seventh Plan through 100 cooperative societies. The share capital for these societies would be Rs. 2.00 lakh, lease money Rs. 5.50 lakh and nets, boats and equipment of Rs. 12.50 lakh.

### **Fish Farmers Development Agency**

The Dandkaranya Development Authority has constructed 26 minor irrigation tanks and about 133 village ponds in Paralkot Zone for the benefit of settlers. Besides this, several settlers have their individual dug out tanks in their land holdings. Kondagaon Zone has also a large number of village ponds. The above mentioned tanks and ponds are not being utilised to the fullest potential although many of the settlers have a background of pond culture and could be motivated to adopt the improved techniques of intensive fish culture. With this end in view, it is proposed to establish a Fish Farmers Development Agency. The Agency will be registered under the M.P. Society Registration Act. The Dandkaranya

Development Authority has also been stressing for the establishment of such an agency. The Agriculture Refinance Development Corporation is also likely to extend financial help in this regard. The main aims of this agency would be;

- (a) to arrange fish pond lease for the fish farmers on improved terms for a period of 10 years.
- (b) to help the fish farmers in obtaining institutional finance to take up intensive fish culture and adopting modern techniques.
- (c) to provide intensive extension services linking effectively training and investments.

Under this scheme an extension worker for every 100 ha. of water area will be provided.

#### **Training**

The proposals for developing 4000 ha. village pond area and 1000 ha. irrigation tank area during the Seventh Plan will involve considerable organisational endeavour. It would be in the interest of the people if the development of this water area is organised through cooperative societies with a view to involve people directly with the development activities. It is, therefore, proposed to organise 100 fishermen cooperative societies each with a membership of 25 persons. Thus 2500 tribal fishermen will have to be imparted training with regard to fish culture practices, pond management, fabrication and maintenance of fishing gears. It is estimated that training of each trainee would cost about Rs. 1200.00.

#### **Additional Staff**

In order to execute the proposed schemes efficiently and also to cope up with the increased work load, the existing organisation of officers and workers in the district will have to be strengthened. The existing strength and the proposed strength of technical and other personnel is summarised below :

Category	Existing	Proposed
1	2	3
<u>Technical</u>		
Jt. Director	-	1
Dy. Director	1	1
Asstt. Director	5	-
Fishery Extension Officer	11	5
Asstt. Statistical Officer	-	1
Tech. Assistant	-	1
Sub Engineer	2	-
Fishery Extension Worker	47	-
<u>Ministerial</u>		
Office Assistant	1	2
Stenographer	-	1
Accountant	1	1
U.D.C.	4	7
L.D.C.	8	8
Peons	8	7
Fishery Jamadar	11	50
Drivers	-	6
Office Chowkidar	1	5

The above proposed staff is considered necessary to effectively cover the district and to ensure proper supervision and implementation.

Financial involvement for the entire proposed fishery development programme is as under :

Programme	Estimated Cost (Rs. lakh)
1	2
<u>1. Fisheries Extension</u>	
Improvement of tanks	40.00
Stocking of fish seed	16.88

1	2
2. <u>Development of Reservoirs</u>	
Reclamation	10.00
Guarding of waste weirs/spill ways	20.00
Stocking of fish seed	1.20
3. <u>Development of Village Ponds</u>	
Stocking of fish seed	13.95
4. <u>Development of Riverine Fisheries</u>	
Stocking of fish seed	2.25
5. <u>Production of fish seed</u>	
Construction of 5 ha. hatchery	36.00
Construction of chinese type hatchery	10.50
Equipment and operating cost	4.50
6. <u>Training</u>	30.00
7. <u>Fish Farmers Development Agency</u>	
Pond improvement and provision of inputs	3.00
8. <u>Cooperative Societies</u>	
Share Capital	2.00
Lease money	5.50
Equipment	12.50
9. <u>Administration</u>	89.68
	<u>Total : 297.96</u>
	or <u>298.00</u>

## FOREST

### 1. General Review

Bastar is very rich in forest resources. Bastar forests existing over 20,000 sq.km. form one of the largest and complex biogeographic zones in the country. Favourable climate and suitable physical and other locality factors have contributed to create a good quality valuable forest resource. Teak and Sal along with their associates characteristically occur together in these forests indicating their importance commercially and ecologically.

These forests were very rich in the past. Studies carried out during sixtees indicate huge forest wealth. Inventory of forest resource carried out during 1967-69 by PIS GOI/FAO Organisation indicated that these forests contain a growing stock of about 200 million cubic meters which is supposedly equal to one tenth of the forest resource of the whole country.

### Forest Classification

According to Chamion and Seth's "Revised Classifications for Forest Types of India" the forest of the district belong to the groups :

- (i) Moist peninsular sal forest.
- (ii) Moist teak forest.
- (iii) Moist mixed miscellaneous forest.
- (iv) Dry teak forest.
- (v) Dry mixed miscellaneous forest.

### Forest Wealth

Sal often occurs virtually pure. However it is found frequently mixed with miscellaneous species also. Its most common associates are Saja, Bija, Dhaoda, Tendu, Jamun, Kakad and Mango, which together with sal account for about 85 per cent of the standing crop volume per hectare. Sal itself often represents nearly 75 per cent of the standing volume per hectare. In this type the other common associates are Haldu and Tinsa. In an inventory

carried out by MPFTAP, Bastar, it was indicated that the sal forests, on an average have about 340 stems per ha. of over 10 cm. dbhob, of which about 80 per cent stems i.e. about 270 stems are of less than 30 cm. dbhob and about 75 per cent of the standing volume is contributed by trees of less than 50 cm. dbhob. It is noticed that sal does not, generally occur in West Bastar region, although sal often forms a substantial component of the miscellaneous forests in other areas.

Teak is found scattered throughout, though occasionally, pure patches of teak of varying extent may also be met with. It is noticed that only about 16 of the multitude of species comprising these forests constitute the bulk of their total volume. The rate of growth of teak from plantation data of these forests is found equivalent to All India Site Quality II, which would mean that at the age of 25 years the mean crop diameter attained is about 25 cm. and the mean crop height about 27 m. This would give a yield of 108 cu. meters per ha. and the MAI of about 4.3 cm. per ha. per annum.

Bamboo occurs throughout the district. It is widely distributed in Kapsi, Matla, Konta, Bijapur and Paralkot areas. It is often of a good quality, particularly along river banks when associated with teak. However, it is absent from all good forests except in a few portions where thin bamboos called panibans are found.

Miscellaneous forests are composed of a number of miscellaneous species which are generally small dimensioned. The main species are Saja, Sal, Dhaoda, Tendu, Mahuwa, Garari, Bija, Salai and Haldu.

### Infrastructure

Bastar is a sprawling district and the principal means of transport is the road. The length of forest roads and other roads is as under :

Year	Length in Km.			
	P.W.D. Roads	Local Bodies	Forest Roads	Total
1970-71	1095	26	2190	3311
1975-76	1785	32	2291	4108
1980-81	2500	40	2315	4855

Source: District Statistical Handbook - Bastar.



During first two Five Year Plans the development schemes included construction of roads, survey and demarcation of forests and construction of inspection huts and godowns etc. During Third Five Year Plan period one plantation division was created which took up large scale plantation of Eucalyptus in the district. The scheme continued upto Fourth Plan period and an area of more than 10,000 ha. has been planted up with Eucalyptus.

Development Corporation in the district started experimental tropical pine plantation since 1975-76 and an area of 1600 ha. has been planted up to 1981.

The area under different types of forests classified according to their legal status is as under :

Legal class	Area (sq.km.)
1. Reserved Forests	9,851.5
2. Protected Forests	6,898.5
3. Undemarcated Protected Forests	4,237.6
<b>Total</b>	<b>20,987.6</b>

### Production

The details of current production of important forest produce is given as under :

<u>Forest Produce</u>	<u>Average Annual Production</u>
I. Timber	
(a) Logs	2,25,000 M <sup>3</sup>
(b) Poles	1,45,000 M <sup>3</sup>
II. Fuelwood	1,50,000 Tonnes
III. Bamboo	
(a) Commercial	55,000 MT
(b) Industrial	30,000 MT
IV. Tendu Patta	3,25,000 Standard bags.
V. Sal seed	16,000 Tonnes
VI. Myrobolams	50,000 Tonnes

Important existing forest based industries include saw milling and furniture making, plywood industry, sal seed solvent extraction plant, etc. Except for furniture making industry other small scale industries are not well developed.

By the end of Sixth Plan, plantation of various species would be completed over an area of about 10,225 ha. In addition 62,000 fruit trees would also be planted. The programme for the Sixth Plan includes construction of godowns, labour huts, other necessary buildings, roads and soil preparation for further plantation. An important programme, however, is the rehabilitation of degraded forest but owing to scanty financial resources for investment the programme is progressing at a snails pace. Another programme aiming at developing local competence in forestry management and involving tribals in forest preservation and propagation is the training programme of tribal youth and about 150 boys are expected to be trained before the commencement of the Seventh Plan.

### Problems

Bastar district is predominantly tribal and the dependence of tribals on the forest is almost total. In many parts of the district these tribals form part of the forest ecosystem. They get their house and hearth and livelihood from forest and their socio-economic conditions are determined by and are inseparably linked with the forest. Apart from utilising timber for constructing their houses, fuelwood for energy requirements, and grasses for thatching their roofs and making ropes they use forest directly also for sowing their crops. This notorious method is known as dahya or gudumor or penda cultivation in which the forest patches are burnt down into ashes. Tribals are unacquainted with any other form of manuring. Consequently, they go on shifting cultivation sites after every two or three years with clock like regularity. However, it has reduced in terms of area and excepting the area of Abujhmar it has declined elsewhere to a marked degree. Extensive portions of the forest are burnt, often two or three times a year. Normally, such fires are confined to the understory or creep along the ground but they cause substantial damage to the lower stems of less fire resistant species and they often prevent the establishment of natural regeneration. The causes for such fires are many but

important among them are the shifting cultivation and the clearance of the forest floor for easy visibility of mahua flowers or sal seed at the time of their collection. Tribals are also encroaching upon forest land for cultivation. The areas of the forest encroached upon by the tribals could be identified by girdled trees which in due course would dissipate and die leaving the forest floor open for cultivation.

During the last thirty years or so these forests have been exploited without paying adequate attention for their conservation and development. Biological and sociobiological pressures on the forest have also increased considerably with the result that process of forest degradation has set in. This has naturally affected adversely the socioeconomic conditions of the tribal population. Their fuel-fodder-fibre-food and timber resource near their habitation has dwindled and its ill effects are being experienced by them. It has become common in such areas to move out to farther areas in bullock carts and in groups for days together to collect fuel wood for their daily consumption.

## **2. Approach and Strategy**

The fact that agriculture does not provide the tribals with food for the entire year increases pressure on forests. For centuries tribals have depended upon forests for their food and now they have come to regard forests as their natural property. Earlier attempts aimed at bringing the tribals out of the deep forests have failed and it is said that forest reservation policy was one of the main contributing factors for the 1910 rebellion. This spells out the need for a more restrained approach in adopting a rationale for forest development policy. The situation also demands that alternative avenues for raising the incomes of adivasis should be attempted so that their direct dependence on forest is reduced. The old concept of plantation in forest areas which was highly biased in favour of large industries should give way to more rational measures obviously in favour of the interests of tribals. A more comprehensive approach combining the interests of industry agriculture and the tribals should be formulated. Accordingly, it is proposed that a three canopy plantation which will include industrial timber trees, soft wood trees, bamboo, cane, timber for rural needs, aromatic and industrial grasses, medicinal herbs, fruit trees

and such other plants which provide edible roots and tubers to the adivasis should be adopted. Such a scheme of things would decidedly satisfy the growing demands on forests and will, at the same time diversify interests and provide additional income generating opportunities to local people in the form of cottage and household industries.

A forest plan can only be conceived properly in the overall context of a general integrated development approach pertaining to all sectors. Forests of the district are a resource and this resource base can be manoeuvred to generate employment opportunities through small, medium and large forest based industries. While medium and large scale wood based industries would require a large financial resource for investment a network of cottage and household industries can profitably be created in the cooperative and private sectors. Utilisation of major part of forest resources within the district and export of finished goods will generate substantial incomes to the tribal population and in the process they will start using the forest resource much more economically and optimally than what they are doing now. Their dependence on forest will take a more meaningful form.

Tourist industry is fast developing in the country. Bastar district can also claim its legitimate share. With the presence of ever-green dense, dark, deep and invitingly beautiful forest, tree covered hills, undulating topography, rivers coursing through difficult mountain terrain creating breath takingly beautiful water falls and then gliding away in smooth motion, high elevation some of them composed of blue high grade iron ore, one of the finest working mines at Bailadilla and a host of natural caves create a potential of vast tourist possibilities. Wild animals were once galore in the region. There are references in Aine-Akbari regarding elephants to be roaming in these forests. According to Mr. Gaar, former diwan of Bastar State the rhinoceros was also found in the district particularly in the area south of Indrawati. They have long since either migrated to the south to a more hospitable habitat or they were exterminated by the cruel hand of time and men. But their absence from the scene is evidence enough regarding the changing character of forests of the district. Now the animals met with are tiger, Panther, Bhalu (bear), Gaur (Indian bison), wild Buffalo, Barasingha, Sambhar, Cheetal, Neelgai, Kotri,

Deer, Wild Boar, Antelope etc. In spite of adverse conditions the game, as these animals are generally referred to, is still available in Bastar. These apart, the forest of Bastar are full of varieties of small game, birds and fowl. The pride of place, however, must go to the hill maina (*gracula neligiosa*) which is a famous bird of Bastar and is matchless mimic of human voice.

The government have prohibited shooting in Bastar with a view to preserving wild life. With the arrangements of their protection taken care of attention has to be focussed on their preservations and growth. There is one national park known as Indrawati National Park and two game sancturies known as Bhairamgarh and Pamed game sancturies, established for the express purpose of providing further protection of the wild life in the district. These national park and game sancturies if properly developed can also serve as tourist centres apart from performing its original function of protection of wild life.

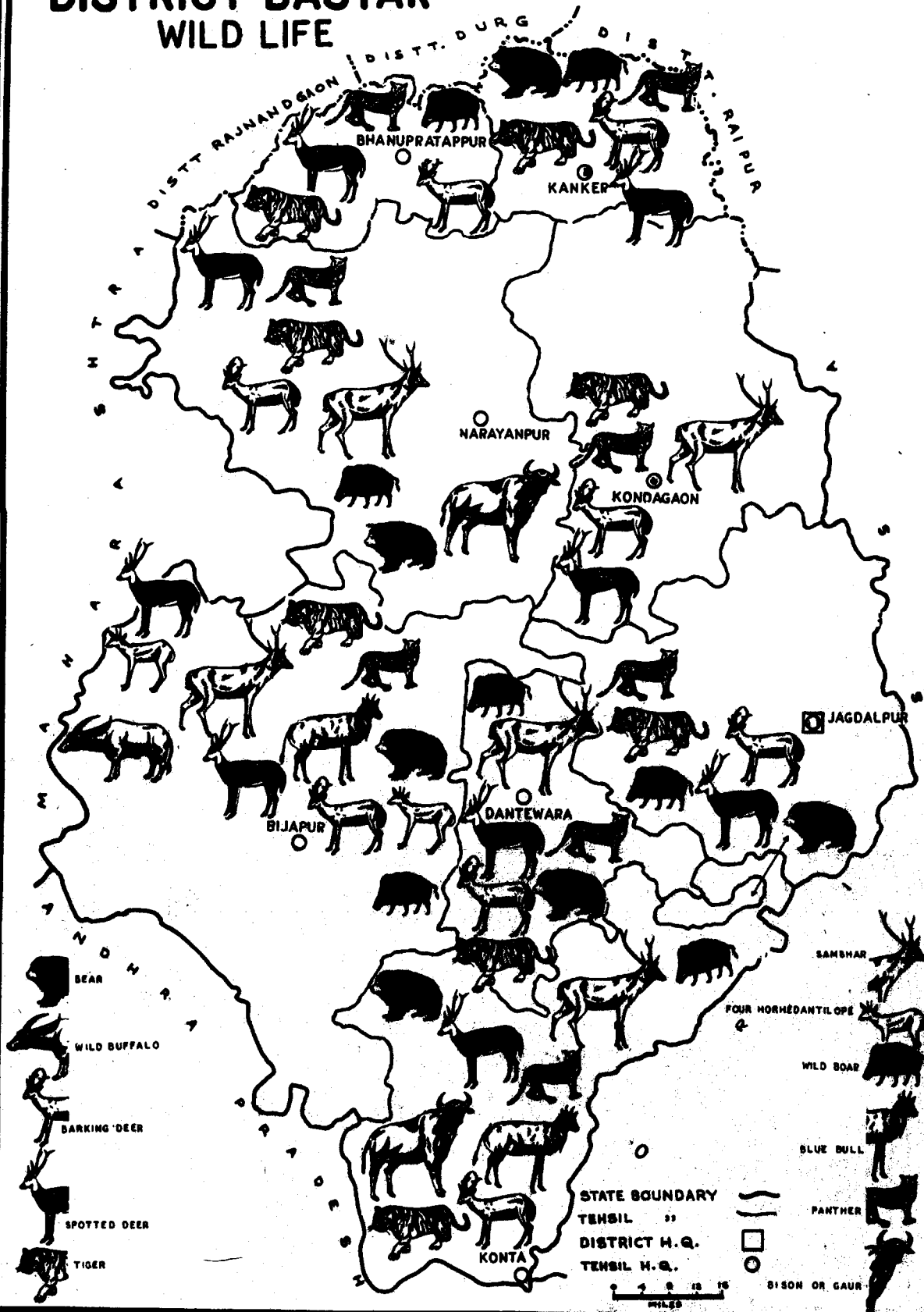
Keeping in view the above situation a forest development and working plan aiming at restoring the lost glory of Bastar forests, rationalising the use of forests by the tribals, meeting the needs of industrial sector and creating conditions for the survival of natural ecosystem, has to be formulated. The emphasis would be on bringing back the lost area through a well conceived plan for afforestation, reorganisation of plantation strategy and improving the working of existing forests. The aim would also be to increase revenue from forests through better management. The programme would therefore be to ensure a vigorous renewal of existing species and introduction of new varieties according to the demand likely to be generated by other sectors of the economy.

### 3. Plan Proposals

Accordingly a set of schemes is proposed to be taken up as part of special plan for Bastar. The following are the schemes proposed which may be taken up in the Seventh Five Year Plan of the State.

1. Plantation of existing and new species.
2. Afforestation and rehabilitation of degraded forest area.

# MADHYA PRADESH DISTRICT BASTAR WILD LIFE



3. Beneficiary schemes for the tribal target group.
4. Wildlife and habitat development.
5. Construction of roads.
6. Administration and supervision.

The details of these schemes are individually given below :-

### Plantation

#### (a) Bamboo

Bamboo is a very versatile forest species. It is in great demand not only by local population for domestic consumption but is also the most sought after raw material for many cottage industries. It is a principal long fibred raw-material for pulp and paper industries. Demand for Bamboo is increasing day by day and its production in natural forests has been declining in the past few years with the result that acute shortage is being felt both in domestic and industrial sectors. Cultivation of Bamboo is potentially capable of giving very attractive returns. It can be planted in all areas of Bastar district since it can be grown in almost all types of soil. However, growth is good in well drained sandy loam soils.

The main objectives for taking up bamboo cultivation are :

- (a) to produce raw-material for cottage industries e.g. basket and mat making etc. and
- (b) to provide structural material for the construction of houses and huts etc.

The scheme can be tried in almost all parts of Bastar district but the scheme is likely to be easily acceptable in Bastar, Charama, Sarona, Kanker, Kondagaon, Geedam, Usoor, Tokapal, Keshkal and Dantewara Development blocks. Bamboo plantation can be available from the first harvest after a period of about 7 to 10 years and thereafter yield can be had on a four year felling cycle for about 30 to 35 years.

An yield from natural forests indicates that bamboo is giving an yield of about one tonne per ha. to about 25 tonnes per ha. depending upon stocking, size of clumps and culms etc., on a four year felling cycle. Bamboo plantation raised in Kurundi of Bastar district in the year

1972 has yielded about 27 tonnes per ha. in its first harvesting done in March, 1981. It is expected that bamboo yield can be obtained from 10 tonnes per ha. to 15 tonnes per ha. annually out of an average plantation.

The economic returns from bamboo plantation can be more than agriculture in marginally productive areas. A target of 1000 ha. per year of bamboo plantation is being proposed.

**(b) Sisal (Agave Spp.)**

Sisal is commercially an important species and is used in the manufacture of a wide variety of articles. Sisal fibres are used for the manufacture of a marine and industrial ropes. The fibre is also used in the manufacture of bags and sacks, fishing nets and various types of brushes and brooms. Sisal pulp is also used for washing clothes by poor people. The flowering stock can be used as timber and fuel wood.

The main objective of Sisal cultivation is to extract fibres for making different types of ropes. Internal consumption of Sisal ropes in the country is about 20,000 tonnes. Against this, the annual production is hardly 3000 tonnes. Sisal grows well on light calcareous and gravelly soils with good drainage conditions. Soil with water-logging condition are not suitable at all. The sandy loams and loamy soils with sufficient organic matter are the most suitable. It also grows well in red and lateritic soils. It can be grown in degraded and eroded lands. It can be grown also along the cattle proof trenching.

This scheme can be taken up in 14 blocks of Bastar district namely, Lohandiguda, Durgkondal, Tokapal, Jagdalpur, Bastar, Charama, Sarona, Kanker, Kondagaon, Konta, Sukma, Bijapur, Usoor and Bhopalpatnam. In other blocks too this programme can be taken up.

Sisal plants when properly grown with care and with suitable doses of fertilizer are ready for cutting of leaves after a period of 30 months. Sisal plants can yield fibre from third year onwards. Fibres can be extracted with hand decorticators and these decorticators can be manufactured by village carpenters. An average crop can yield about 5 quintals of dry fibre per ha.



It is proposed to bring 500 ha. under Sisal annually.

**(c) Sabai Grass**

Sabai (*Eucaliopsis binata*) is an important grass species which is used for rope and also for paper manufacture. Sabai ropes are used for various purposes. Forest Department alone consumes sabai ropes worth Rs. 75 lakh annually. There is a large demand in domestic market. The main objective of growing sabai grass is to produce raw material for rope making for which cottage industries can be developed. Sabai grass can be grown on eroded and degraded lands and thus it offers scope for establishing a chain of cottage industries in the rural area of the district.

Sabai grass cultivation can be taken up in Lohandiguda, Tokapal, Bastanar, Bastar, Jagdalpur, Bhanupratappur, Charama, Kanker, Keshkal, Kuakonda, Geedam, Usoor and Katikalyan and some other development blocks. Sabai plantation can start giving yield from the third year.

Physical targets for cultivation of sabai grass is proposed to be 500 ha. annually. Thus, total physical targets will work out to 2500 ha. in the district.

**(d) Cashew-nut**

The main objective of undertaking cashewnut plantation is to utilise the degraded and lateritic lands and to increase the production of cashew in the country.

Cashew plantation can be taken up in atleast Charama, Kanker, Sarona, Bhanupratappur, Durgkondal, Keshkal, Baderajpur, Pharasgaon, Kondagaon, Bastar, Bakawand, Jagdalpur, Bhairamgarh, Bijapur, Bhopalpatnam and Usoor blocks of the district, especially those areas which are connected with roads. A cashew tree starts giving returns after about 7-8 years of planting.

It is proposed to raise cashew nut plantation on 25 ha. in each block which may subsequently be increased after gaining experience. Total targets of cashew plantation in the district works out to 2000 ha.

**(e) Medicinal herbs**

The main objective of taking the plantation of medicinal plants is to restock the area with medicinal plants so that tribals may use them as they did in the past. Also they may collect them and sell in the market to increase their income.

Plantation of medicinal herbs can be tried in Darbha, Jagdalpur, Dantewara, Geedam, Bhairamgarh, Usoor, Kanker, Antagarh, Keshkal and Kondagaon blocks.

The species which may be taken up for plantation may include Sarpagandha (*Rawolfia-serpentina*), Mint, (*Mentha Piperata*), Tikhur (*Curcuma angustifolia*), Shatawar (*Asparagus-racemosus*) etc.

The plantation will have to be raised on good soils, and with irrigation preferably. The plantation techniques are not well perfected. Therefore, plantations have to be first raised on experimental scale which may be increased after gaining experience.

Precise estimates of the yield of medicinal plants are not available but market rates of the products are very high which should make the plantation quite profitable.

Since it is pilot plantation, the targets for the district would be 50 ha.

**(f) Aromatic Grasses**

Aromatic grasses grow naturally in the forests but their crop is not substantial. Many of the aromatic grasses yield oil which is commercially very important. The oils can be extracted by small distilling units.

The grasses which can be cultivated are Citronella, Rosa, Khas, Nagarmotha, Lemon etc. The plantations of these grasses can be grown pure and also mixed with other tree species. The villagers may be allowed to collect these grasses and extract oil.

Aromatic grasses on 50 hectares may be planted in the district annually.

**(g) Arjun (*Terminalia arjuna*)**

Many tree species e.g. Arjun (*Terminalia arjuna*) mulbury (*Morus alba*) Saja (*Terminalia alata*) etc. provide excellent shelter and food for tassar producing worm. Plantations of these species can be raised for rearing of silk worm. The programme will generate sustained employment to the tribal families and will help in establishing tassar silk village industry.

Plantation of Arjun can be taken up in Charama, Kanker, Sarona, Bhanupratappur, Narayanpur, Bastar, Jagdalpur, Geedam, Sukma and Konta blocks.

This scheme can be implemented economically over an area of 1 ha. or more at one place. For proper silk worm rearing one ha. area is proposed to be planted with about 4000 plants.

Arjun tree not only provides food material for silk worm but its bark can be used for extraction of oxalic acid and wood can be used as timber and firewood. The total receipts from tassar in the fourth year is expected to about Rs.3600 and from sixth year onwards Rs.6000/- per year upto the thirteenth year. Initially its cultivation on 1250 ha. is proposed during the plan period.

**(h) Cane**

Cane (*Calamus teneus*) is commercially very important species. Cane furniture is in great demand and is generally very much valued. Cane occurs naturally in several small pockets of the district. There is a possibility of taking up pilot plantation of this species. Suitable localities are available in the district.

The plantation of this species can be taken up by nursery raised seedlings or cutting. It is proposed to take up plantation in Dantewara and Bakawand development blocks in about 5 ha. annually.

The proposed plantations will be experimental in nature and therefore cost per ha. is likely to be more.

**(i) Semal (bombax ceiba)**

Semal (bombax ceiba) is commercially important species. The wood of this species is used for manufacture of match splints and match boxes. Match splints and match-boxes industry can be established on cottage scale. The industry has a very good future. A 25 to 50 ha. plantation can sustain a small scale match splint industry.

Semal plantation can be raised by sowing seeds or by nursery raised seedlings. However, severe pourcupine damages have been reported in case of pure plantation. It is therefore advisable to raise this species in mixture.

It is proposed that Semal plantation may be taken up in 100 ha. in the plan period.

**(j) Fruit Trees**

A variety of trees with edible fruits are found in the forests. With increased population pressure and excessive collection the number of such trees has gone down in the forests which has deprived tribals of nutritive and supplementary food. Plantation of fruit trees can be taken up near habitation to supply the most needed fruits. For cultivation of fruit trees all Development Blocks of the district except Abhujmar may be selected.

The fruit trees to be planted should be those which are most liked by tribals e.g. Mango (*Mangifera indica*), Kathal (*Artocarpus heterophyllus*), Imli (*Tamarindus indica*), Jamun (*Syzygium cumini*), Mahua (*Madhuca longifolia*), Munga (*Moringa olifera*), Ber (*Zimiphus mauritiana*) etc.

In order to ensure proper growth a good deep soil working and addition of manures and fertilizers will be required. Watering during first and second year will improve chances of success. Maintenance costs per ha. may be about Rs.500/- per ha.

Most fruit trees will start fruiting between 5 to 10 years of age. The return from fruit trees are highly lucrative. The increased fruit yields will improve the diet of the tribal and their sale will

improve their economy. The plantation of fruit trees will economically be highly viable proposition as returns from these plantations may be roughly Rs.5000/- per ha. from tenth year and will increase to Rs.10,000/- per ha. when the plants are fully grown.

Physical target is proposed to be kept at 2000 ha. in the district.

### **Afforestation of Degraded Forest Area and Commercial Plantation**

It is estimated that approximately 20 per cent of forest area of Bastar has become degraded. It is therefore, very necessary to restock this area urgently. If the area is not restocked erosion and rapid runoff will create various environmental problems e.g. flood, drought, poor rainfall etc.

The total land area needing treatment may be approximately 4,00,000 ha. The exact area under degraded forests is not known but such area occurs in almost all development blocks.

The area may require restocking by plantation. Some area can be restocked by effecting closure. For purposes of plantation important timber, fuelwood, fodder and fruit/feed yielding species meeting the requirements of site may be selected. The existing programme of plantation needs strengthening. In some areas commercially important species may be taken up for plantation.

The total area requiring immediate treatment is estimated to be 2,00,000 ha. out of the total mentioned above. This area is to be planted up, say within 25 years. The annual targets work out to 8000 ha. The present plantation targets in Bastar district is only 4000 ha. Therefore, additional 4000 ha. will have to be taken up for plantation. About 3000 ha. will be under social plantation and 1000 ha. may go to commercial plantation of Teak, Sisal and other species.

### **Individual Beneficiary Scheme**

Tribals have a very deep relationship with forests but forests near their habitations have depleted due to various biological pressures.

These forest lands can be improved with cooperation of local villagers. The villagers may be allotted some land for plantation and they may have the benefit of usufruct. They will have to be helped technically and financially.

The scheme can be taken up in all the Development Blocks except in Abhujmar. Suitable areas can be selected for allotment to individual beneficiaries. Forest Department will provide help technically and financially for support of this scheme. It is proposed to allot 2.5 ha. land for each beneficiary and he will be asked to raise plantation in 0.25 ha./annually for 10 years.

Cost of plantation which is likely to be about Rs.5000/- per ha. will have to be borne by the Forest Department to be given either as a loan or as a grant to the tribal. The family will have to be provided some allowance annually for maintenance of plantation. Benefits will go to individual beneficiary. This will also help in re-vegetating the land and provide all indirect benefits.

It is proposed to select at least 5 beneficiary in each Block. Thus the total number of beneficiaries per year would be about 200 in the district.

Nursery and plantations are considered governmental activities owing to the costs involved. In order to involve private persons for raising plantation of valuable species raising of suitable nursery should be considered as a first step. The people will be economically rewarded as Forest Department will purchase all the seedlings raised by private persons. The scheme can be taken up in all the development blocks except Abhujmar.

Forest Department will provide seed polythene bags and the know-how for raising seedlings. The villagers will work to raise the nursery on their fields and protect them. After the seedlings become of one year age these will be purchased by Forest Department at remunerative rates.

At least 2 to 5 private nurseries will be raised in a block. This will mean that in the district about 100 private nurseries will be raised.

### **Wild Life Development**

There are two sanctuaries in the district, at Pamed and Bhairamgarh. It is proposed to construct 2 earthen dams each year, one in each sanctuary for providing drinking water facilities to wild life. This will help develop fauna in the area.

### **Survey and Demarcation of Orange Areas**

In Bastar district there are 4 lakh ha. of undemarcated protected forests usually called "Orange areas". These areas are not under any scientific management plans. It is therefore necessary to survey, demarcate and settle these areas so that ownership is clear and after proper demarcation these areas can be brought under systematic management.

It is proposed to organise proper survey and demarcation of the area for which one Survey Division is necessary. The Survey Division should consist of 16 survey parties. After survey and demarcation a large part of this area would be included under scientific management plans and thereafter the area can be developed by suitable technologies.

### **Construction of Forest Roads**

Forest roads serve many purposes. On one hand they improve the harvesting of forest produce and on the other and most importantly, they serve as vital means of communication in the area. Bastar is a very big district and for speedy development of the area, it is essential to develop various means of communication.

The proposed roads are likely to fall in Dantewara, Darbha, Bastanar, Bhairamgarh, Bakawand, Kondagaon, Bhanupratappur and Geedam Development blocks. The annual target is proposed to be 45 km. during the Plan period.

### **Additional Organisation**

The proposed schemes are in addition to the existing works and programmes. It is therefore necessary to provide additional organisation. Taking into account the work load it is proposed to create one circle and 5 new Forest Divisions; one for survey and demarcation work and other four for taking up and supervising plantation work.

Each division will have one Divisional Forest Officer, 6 Rangers, 18 Foresters and 54 Forest Guards for taking up and organising field work. Other complement staff according to scale shall also be needed.

The allocation required for carrying out the envisaged Forest Development programme during the Seventh Plan would be of the order of Rs. 53.46 crore the details of which are summarised below :

Scheme	Proposed financial allocation (Rs. lakh)
1	2
1. <u>Plantation</u>	
(a) Bamboo	319.80
(b) Sisal	273.67
(c) Sabai grass	122.00
(d) Cashew nut	166.68
(e) Medicinal herbs	6.11
(f) Aromatic grasses	30.52
(g) Arjun for Tassar	163.17
(h) Cane	2.16
(i) Semal	53.64
(j) Fruit trees	156.10
2. Afforestation and Rehabilitation of degraded forest area and commercial plantation	2605.74
3. Beneficiary Schemes	90.36
4. Wild life habitat development	312.17
5. Survey and Demarcation	61.03
6. Construction of Roads	274.75
7. Administration & Supervision	707.87
	<u>5345.77</u>



## IRRIGATION

### 1. General Review

Bastar district has vast water resources which are yet to be harnessed fully. The district falls in the drainage systems of two river basins viz. (1) the Godavari basin which includes Indrawati Sabri and lower Godavari sub basins, and (2) the Mahanadi basin which includes Mahanadi and its tributaries. The drainage area and the length of the major rivers in the district and the quantum of available surface water for use is shown below. The quantum of surface water available for use has been calculated at 75 per cent dependability.

Rivers	Drainage area (Sq.Kms.)	Length of river (Kms.)	Quantum of surface water available at 75 per cent dependability (Mm <sup>3</sup> )
1	2	3	4
Indrawati	26554	372	12710
Sabri	5680	180	2632
Lower Godavari	4240	24	1997
Mahanadi	2640	64	1026
	39114	640	18365

### Water Availability

The availability of ground water in the district has been estimated at 4410 Mm<sup>3</sup>. These calculations have been based on geohydrological surveys conducted in some of the blocks of Bastar district and the estimates are prepared at 50 per cent net recharge rate.

A rough assessment has also been made for regeneration by assuming a recharge of 10 per cent of water from irrigation use. It works out to about 137 Mm<sup>3</sup> for the proposed water use.

Thus the total availability of surface, ground and regenerated water works out to 22,912 Mm<sup>3</sup>. The details are as under :

Surface water	75 per cent dependability	18365
Ground water	50 per cent net recharge	4410
By regeneration	10 per cent water use in irrigation	137
		<u>22912</u>

The total water resource as calculated above is sufficient to meet the irrigation needs of the district. It is estimated that about 27 per cent of the total geographical area of the district i.e., about 9 lakh ha. can be put to agricultural use. The water resources estimated to be available in the district is adequate to meet the demand of modern agricultural practices on the area estimated above.

### Irrigation Potential

The State, through its developmental efforts, have created irrigation potential for 25,288 ha. by the end of June 1982. In addition, the Dandakaranya Authority has also created a potential to irrigate 17,416 ha. The position as obtained at the end of June 1982 is summarised below.

Agency	Potential created by the type of irrigation works ( '000 ha.)							
	L.I.S.		MEDIUM		MINOR		TOTAL	
	No.	Area	No.	Area	No.	Area	No.	Area
1	2	3	4	5	6	7	8	9
M.P.Govt.	9	783	1	1482	175	23023	185	25288
Dandakaranya Authority	-	-	1	14575	30	2841	31	17416
	9	783	2	16057	205	25864	216	42704

The potential created through private sources is estimated at 5380 ha. during the same period. Thus, the entire potential created by the end of June 1982 comes to 48084 ha. which is likely to consume 392.26 Mm<sup>3</sup> of the water resource. The sourcewise distribution of water use is as under :

Source	Area (ha.)	Water use (Mm <sup>3</sup> )
1	2	3
Government	25288	199.11
Dandakaranya	17416	151.99
Private	5380	41.16
TOTAL;	48084	392.26

With a view to ensuring maximum utilisation of available water wealth in the district the State has further taken up construction of a number of irrigation projects and also survey of economically viable sites to be taken up in future. As such irrigation potential by government source is gradually going up at the end of each successive year. By the end of the Sixth Five Year Plan, the irrigation department is likely to complete the construction of 11 lift irrigation schemes, 2 medium and 72 minor schemes. The Dandakaranya Authority, too, is likely to complete 7 minor schemes. The irrigation potential likely to be created after the completion of these schemes is estimated at 35,696 ha. The total potential created through government sources and the Dandakaranya Authority at the end of Sixth Five Year Plan would be as follows :

Agency	Created upto June 82	Additional to be created by March 85	Total
1	2	3	4
M.P. Government	25288	34354	59642
Dandakaranya Authority	17416	1342	18758
TOTAL :	42704	35696	78400

The increase in irrigation potential through private sources is not likely to go up substantially. Therefore, for calculation purposes it can be ignored for the present.

Thus, by the end of the Sixth Five Year Plan water use from the total available water wealth of the district is likely to go up to

630.40 Mm<sup>3</sup> excluding the water use through private sources. The position as emerges finally is as under :

Sources	Water use upto June 82 (Mm <sup>3</sup> )	Additional potential (ha.)	Additional water use (Mm <sup>3</sup> )	Total water use (Mm <sup>3</sup> )
1	2	3	4	5
M.P. Government	199.11	34354	268.44	467.55
Dandakaranya Authority	151.99	1342	10.86	162.85
Private	41.16	-	-	-
<b>TOTAL :</b>	<b>392.26</b>	<b>35696</b>	<b>279.30</b>	<b>630.40</b>

Out of the total water resources available to the district 630.40 Mm<sup>3</sup> (3.4 per cent of the total waterwealth) will be trapped and stored leaving a balance of 17,734.60 Mm<sup>3</sup> (96.6 per cent) of water to be managed in future.

Irrigation is a major agricultural input and the need to further increase irrigation potential can not be overemphasised. The spatial distribution of existing irrigation potential leaves much room for expansion at an increasing pace. However, if Bastar district is divided horizontally into three homogenous groups it will be evident that irrigation facilities from government sources are almost evenly distributed among the trisected regions of the district. The following table will illustrate the point :

Region	No. of blocks	Net area	Potential created/likely to be created as percentage of net area sown		
			June 1982	March 1985	Total
1	2	3	4	5	6
North Bastar	9	210.1	3.1	6.3	9.4
Central Bastar	13	327.7	2.2	6.7	8.9
South Bastar	10	243.4	2.7	4.7	7.4

Inter block distribution of these facilities displays wide variation nevertheless. In north Bastar Koilibeda block has the lowest (4.2 per cent) irrigation infrastructure as percentage to net area sown while Sarona block has 20.1 per cent. Similarly in Central region Abujmarh has no irrigation infrastructure from Government source while Bastar block has 32.3 per cent. The disparity in the southern region ranges between Katikalyan block having no irrigation potential created from Government sources to Bhopalpatnam block where it is 30.5 per cent of the net area sown. These disparities need be reduced depending upon the availability of suitable sites in the area, state of agriculture and financial resources. Priorities for taking up irrigation schemes has to be established according to their present distribution.

Agricultural practices in the district range from rudimentary to partially improved categories. North Bastar region being in close proximity with Chhatisgarh region of the State has shown greater flexibility in adopting agricultural practices and cropping pattern as they are prevalent in the adjoining areas. The southern region too, particularly parts of Konta and Bhopalpatnam tehsils, have been influenced with the practices prevalent in adjoining areas of Andhra Pradesh. The analysis of 1981-82 land utilization statistics shows that the net area sown in northern tehsils of the district averages to about 77 per cent of the total culturable area out of which 2.1 per cent area is irrigated. The tehsils of the central region of Bastar have 82 per cent of the culturable area under crops but irrigation is only in slightly more than one per cent of this area. In the southern tehsils 67 per cent of culturable area is cultivated and irrigation percentage is about 1.4 per cent of it. The over all position for the district is that about 75 per cent of the culturable area in the district has been brought under cultivation and a very small percentage (1.48) of it is being irrigated. Statistics for irrigated area obtained from irrigation department places total irrigated area from government sources at 1.85 per cent of the net area sown. If irrigation from private sources is added it will be improved to about 2.4 per cent of net area sown. Even then irrigation is much too meagre particularly when there exists a potential from government source for irrigating 5.3 per cent of net sown area.

The cropping pattern obtaining in the district is mainly kharif. During 1981-82 Kharif crops accounted for about 96 per cent of net sown area. The major part of area sown (95.2 per cent) was under food crops. Out of the total area of 8.37 lakh ha. sown during 1981-82, food crops were grown over 7.97 lakh ha. Non food crops covered only 0.4 lakh ha. The area under cereals was 7.34 lakh ha. out of which 7.29 lakh ha. (about 99 per cent) was sown during Kharif season. Paddy crop emerged as the main crop, which covered about 71 per cent of area under cereals and about 61 per cent of area under all food crops. Paddy is the foremost crop of Madhya Pradesh which covers about 37 per cent of the area under total cereals and it shows that Kharif crops are no doubt, still predominant in the State. The cropping pattern for 1981-82 according to the area under each crop emerges as given below :

('000 ha.)

Paddy	524
Kulthi	36
Niger	17
Kodon-kutki	144
Maize	28
Sawa	15

Rainfall in Bastar district is generally adequate and well distributed over the season yet protective irrigation is required. With the introduction of improved agricultural practices dependence on irrigation has increased. Rabi crops have also been introduced. During 1981-82 only about 2 per cent of paddy crop and 0.7 per cent of Maize was irrigated. Out of total Kharif crops the percentage of irrigation was negligible. However, Rabi crops have shown improvements. During the same year irrigation in Wheat crop was 29.4 per cent of its area sown. Vegetables, spices and condiments registered about 27 per cent irrigation to their total area under cultivation. This is a fair indication of the increase in the demand for irrigation in the future. Presently, there exists a capacity to irrigate 42704 ha. of land from government's sources out of which according to irrigation department it was utilised to the extent

of 15006 ha. in 1981-82 which comes to about 35 per cent of the existing capacity. There is generally a gap between the creation and utilisation of irrigation potential but once it catches up the demand would increase in geometrical proportions. It calls for a strategy whereby irrigation capacity in the district is gradually increased.

The distribution of irrigation potential created so far and is likely to be created by the end of Sixth Plan is shown below :

Sl. No.	Block	Potential created by Government		Potential from private source	Total
		Upto June 83	Upto the end of Sixth Plan		
1	2	3	4	5	6
1.	Charama	4594	2540	710	7844
2.	Kanker	834	1726	600	3160
3.	Sarona	2687	3415	300	6402
4.	Bhanupratappur	951	260	80	1291
5.	Durgakondal	74	583	1000	1657
6.	Antagarh	842	494	-	1336
7.	Koilibeda	65	267	-	332
8.	Keshkal	834	1190	-	2024
9.	Baderajpur	373	643	-	1016
10.	Narayanpur	722	2392	80	3194
11.	Abujhmar	-	-	-	-
12.	Kondagaon	973	1838	150	2961
13.	Pharasgaon	416	265	190	871
14.	Makdi	304	-	-	304
15.	Jagdapur	403	429	400	1232
16.	Tokapal	699	1153	290	2142
17.	Darbha	476	2666	60	3202
18.	Bakawand	859	920	340	2119
19.	Bastar	1491	251	310	2052
20.	Lohandiguda	819	170	110	1099
21.	Bastanar	-	-	-	-
22.	Bhairamgarh	125	838	20	983

1	2	3	4	5	6
23.	Dantewara	660	3442	50	4152
24.	Katikalyan	-	-	-	-
25.	Geedam	569	200	10	779
26.	Kuakonda	292	520	-	812
27.	Konta	661	2687	80	3428
28.	Sukma	1560	548	100	2208
29.	Chhindgarh	1360	3172	50	4582
30.	Bijapur	414	-	100	514
31.	Ussoor	199	-	-	199
32.	Bhopalpatnam	1032	1745	350	3127
		25288	34354	5380	65022

Besides, Dandakaranya Project will also create a potential of 1342 ha. by the end of Sixth Plan in addition to its existing potential of 17416 ha. The total potential will, thus, be 83780 ha. which is about 10.4 per cent of the net sown area. The government source including the Dandakaranya Project constitutes more than ninety nine per cent of the potential. It indicates that irrigation infrastructure shall have to be created through government sources. It can be expected in the long run that people of the area may create their own infrastructure. With a view to bring the district level with the State average a potential of about 20 per cent of the net area sown shall have to be created assuming 60 per cent utilization of the potential. There are only two development blocks one in the north and one in the south of the district which will attain a potential level of more than 20 per cent of the net sown area by the end of Sixth Plan. A programme for creating irrigation potential in the entire district is, therefore, desired. Accordingly proposals have been prepared keeping in consideration the existing level of infrastructure, appropriate sites for harnessing the surface water, and different sectoral programmes to be taken up in the district.

## 2. Approach and Strategy

Irrigation potential created from government sources upto



1981-82 have been utilised to the extent of 35 per cent according to the statistics released by Irrigation Department. It is also evident that due to the availability of water for irrigation use the practice of watering the crops has shown a tendency of gradually going up. The reasons for its inefficient use may therefore be sought in the peculiar socioeconomic factors and agricultural practices prevalent in the district. In most of the areas most of the people look upon agriculture as a means of their subsistence. It has yet to assume the status of a commercialised activity. People are poor and they are unenlightened to the use of modern inputs. The poverty and ignorance go together to sustain a system of primitive cultivation. They do not grow commercial crops for market and whatever surplus they have does not fetch a fair market price. If the cultivators can get a fair market price for their surplus produce, they are as capable here as any where else to transform the subsistent agriculture into a surplus market oriented endeavour. Such a change will be reflected in the form of changes in the cropping pattern, use of inputs and increased demand of water for irrigation. The social acceptance of new techniques is a slow process and is directly related to a great extent with the price factor. There is an imperative need of bringing a change in the attitude of the people through a well conceived and well implemented programme of training and demonstrations as well as proper organisation for marketing the produce of rural area.

\* The other problem to be tackled for a higher and healthier use of water is to provide means to carry water to smaller chaks. Presently water is carried to a chak of 100 ha. The cultivator being poor and unequal in the competitive field of asset formation prefers to go without irrigation rather than creating a socio-economic turmoil for himself. To obtain water from a point in chak of 100 ha. involves investments in field channels and economic alignment invariably involves construction of channels through the fields of other owners. The system of providing subsidy to the cultivators for the construction of field channels may not be of much use since the powerful class of cultivators will not permit the smaller to take channels from their fields. In a rural set up where the weak has to live with the

strong, they are easily influenced and can hardly resist their exploitation. The wayout appears to make a change in the existing system so as to empower the department of irrigation to carry water to a point in a chak of 8 ha.

Irrigation is a technique as well as an input. It has to be provided to improve the status of agriculture. There is not much substance in the argument that further irrigation potential need not be created until the present capacity starts being utilised fully. The argument is neither sustainable on the strength of logic nor tenable on the grounds of equity and economic justice, particularly in Bastar, where irrigation potential of hardly about 8 per cent of the net sown area has been created and the distribution of which is highly un-even. To accept the argument will mean helping those who possess the means and depriving others who may have the inclination but not the means. The development of tribal and backward areas depend mainly on agriculture, for their development can possibly be easier through improved agriculture for which water availability has to be ensured.

There is need to create a task force comprising the personnel of allied departments in each development block to coordinate their activities with a view to make available necessary inputs to the cultivators at the right time and to enlighten them to the ways of modern agriculture.

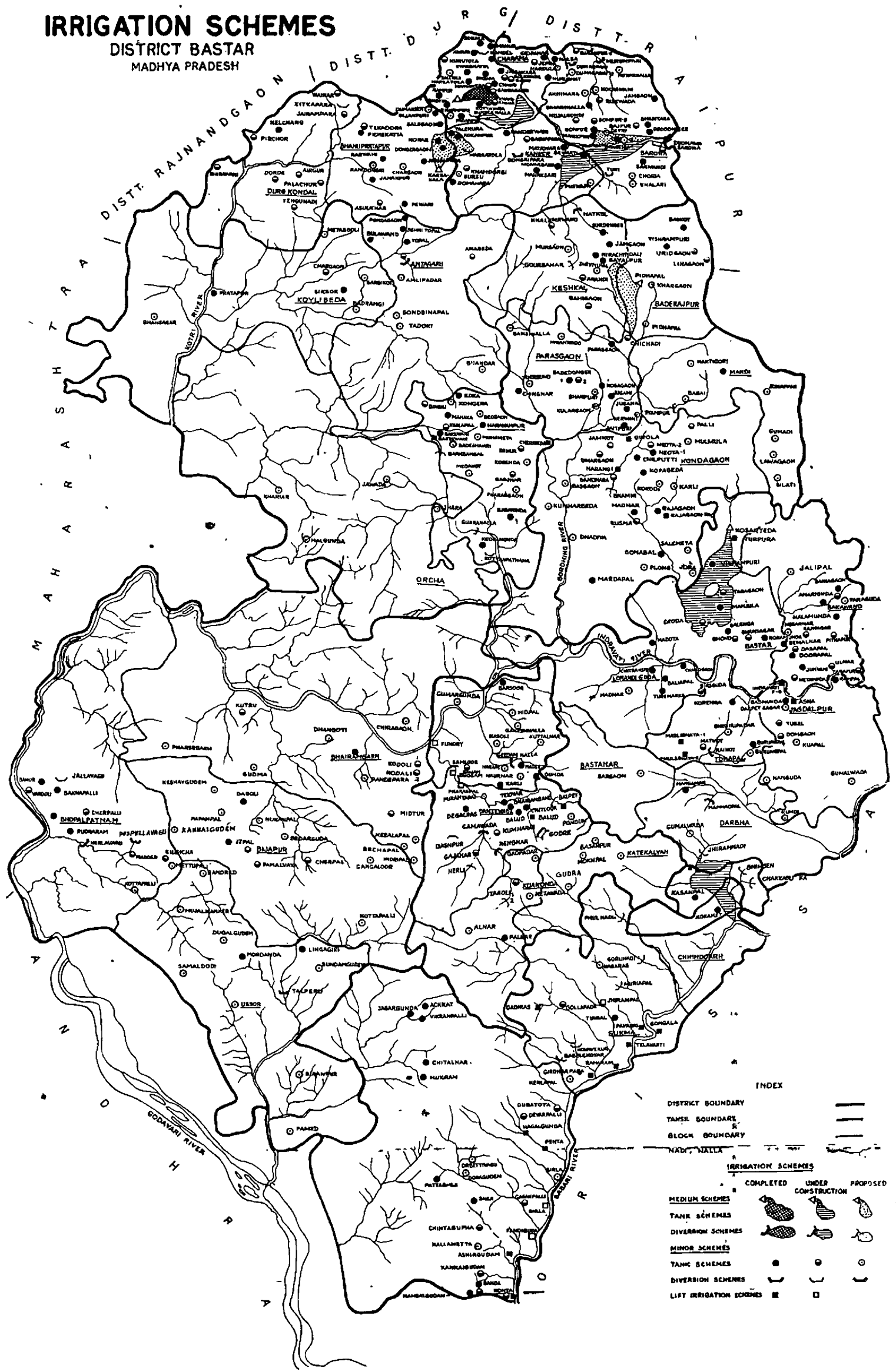
With the adoption of these measures utilisation of irrigation potential in the district will be improved.

### 3. Plan Proposals

The situation aforeanalysed brings out the fact that utilisation of irrigation potential in the district in 1981-82 was about 25 per cent of the total potential created from all sources. The statistics released by irrigation department, however, show an utilisation of about 35 per cent of the potential created by government sources upto 1981-82. But these differences notwithstanding, the utilisation of the potential can be assumed to be in the vicinity of 30 per cent of the created potential. The situational analysis has also indicated that utilisation

# IRRIGATION SCHEMES

DISTRICT BASTAR  
MADHYA PRADESH



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of irrigation potential for Rabi crops is being practiced in the district. Marginal areas under gram and moong (rabi) were irrigated. Wheat crop was irrigated to the extent of 29.4 per cent of its area. Vegetable crops, fruit crops, spices and condiments were also irrigated. The utilisation percentage of the potential and emergence of irrigated rabi crops are positive assurances of the people that water will be used for the crops if made available to them.

By the end of Sixth Five Year Plan irrigation potential will be equal to about 10 per cent of net sown area of the district but its interblock distribution would still be uneven. There would remain development blocks such as Abujhmar, Bastanar and Katikalyan where irrigation potential has not been created at all. The majority of the development blocks of the district fall in the category of having irrigation potential, even less than half the level of the actual irrigation percentage of the State. The change in the attitude of the people for adopting irrigation as a means to improving their yields cannot precede the existence of the means. The need for creating additional irrigation infrastructure arises out of the prevailing situation.

With a view to providing irrigation facilities to all development blocks and to bring the district level with the present state average of 12.8 per cent it is proposed to create irrigation infrastructure capable of irrigating 20 per cent of the cultivated area under the assumption that utilization efficiency will not exceed sixty per cent of the potential. To achieve this objective a ten year perspective plan for irrigation has been contemplated which, when completed, will create the desired level of water storage. In the mean time irrigation percentage is likely to increase as the trend indicates but a concerted effort to educate the people regarding the use of water and alongwith it the use of other inputs needed for raising crop yield shall be made, thus synchronizing the psychological and physical preparedness of the people with the additional availability of the potential so created.

The perspective plan aims at creating an overall irrigation potential of 20 per cent of the cultivated area, but at the same time its objective is also to ensure a reasonable, if not equitable, interblock

distribution of the created resource. The perspective, therefore, has to be conceived in at least two phases, the first phase being devoted to bring irrigation deficient development blocks to a certain minimum level and the second to prepare for the execution of such schemes which may raise the potential level to the desired extent. In concrete terms the first phase would contain programmes to be included in and carried out during the Seventh Plan period. The objective of these programmes would be to create irrigation potential in the development blocks which either do not possess any or are deficient in created potential. Other development blocks will get lower priority. However, spill-over schemes will be continued and completed irrespective of the fact which category of development blocks they are located in.

The ten year perspective plan for irrigation in its totality is produced below :

Sl.No.	Block	No.of schemes	Potential to be created (ha.)	Anticipated cost (Re. lakh)
1	2	2	4	5
<b>I. Medium Irrigation Schemes</b>				
<b>(a) Continuing Schemes</b>				
1.	Bastar	1	8094	129.84
2.	Dantewara	1	1156	35.57
		2	9250	165.41
<b>(b) New Schemes</b>				
1.	Baderajpur	1	3845	1288.00
2.	Bhopalpatnam	1	2700	905.00
3.	Geedam	1	2280	764.00
4.	Bhanupratappur	1	2896	802.00
5.	Kati Kalyan	1	1432	478.00
6.	Durg Kondal	1	1449	529.00
7.	Lohandiguda	1	2769	928.00
<b>Total Medium</b>		<b>9</b>	<b>26621</b>	<b>5859.41</b>

1	2	3	4	5
II. Minor Irrigation Schemes				
(a) <u>Continuing Schemes</u>				
1.	Durg Kondal	4	1233	34.43
2.	Konta	1	354	12.64
3.	Sarona	1	418	16.64
4.	Kuakonda	1	302	12.52
5.	Geedam	1	312	12.85
6.	Koilibeda	1	413	9.95
7.	Pharasgaon	1	222	11.69
8.	Kondagaon	1	258	9.85
9.	Bakawand	2	613	31.40
10.	Dantewara	1	246	12.90
		14	4371	164.87

(b) <u>New Schemes</u>				
1.	Charama	3	540	157.00
2.	Sarona	11	4173	1192.00
3.	Kanker	3	1626	508.00
4.	Bhanupratappur	5	1162	395.00
5.	Durg Kondal	3	821	254.00
6.	Antagarh	6	2563	771.00
7.	Abujhmar	4	2180	767.00
8.	Narayanpur	8	3369	1031.00
9.	Koilibeda	5	2138	646.00
10.	Baderajpur	1	436	133.00
11.	Kondagaon	8	2456	730.00
12.	Pharasgaon	6	2660	753.00
13.	Keshkal	2	1215	370.00
14.	Makdi	7	2217	501.00
15.	Jagdapur	5	1837	599.00
16.	Bakawand	3	1501	483.00
17.	Tokapal	2	1313	425.00

1	2	3	4	5
18. Bastanar		1	1255	422.00
19. Darbha		1	705	236.00
20. Geedam		8	2573	820.00
21. Kati Kalyan		4	959	276.00
22. Kuakonda		3	622	150.00
23. Konta		3	800	239.00
24. Sukma		2	502	146.00
25. Bijapur		8	2917	821.00
26. Bhairamgarh		8	2106	692.00
27. Bhopalpatnam		1	542	165.00
28. Usoor		9	4531	1226.00
Total Minor		130	49821	14908.00
GRAND TOTAL :		153	80537	20932.18

The perspective plan includes 2 medium and 14 minor irrigation schemes as spill-over works from the Sixth Plan. These will be completed during the Seventh Plan period. The new schemes proposed are bifurcated in two action plans from the point of view of execution. First action plan relates to the schemes which are proposed to be included in the Seventh Plan of the State as a special feature pinpointing the area of operation and to be implemented as a time bound programme. The second action plan envisages the performance of the ground work for the preparation of schemes, their survey and finalisation thereof in the form of concrete proposals.

Accordingly, the proposals for the Seventh Five Year Plan have been formulated as produced hereafter. The proposals contain the completion of the construction of 16 spill over and 69 new medium and minor irrigation schemes. There is no major irrigation project included in the proposals. The main emphasis is on equitable spatial distribution of irrigation facility in the district, specially in more backward pockets where this facility does not exist or is extremely meagre.

## Continued Schemes

### (a) Medium Irrigation Schemes

There are two medium irrigation schemes under construction which will continue in the Seventh Plan. These schemes are located in Bastar and Dantewara development blocks. They are likely to be completed in the first year of the Seventh Plan. The additional irrigation potential to be created after the completion of these schemes would be 9250 ha.

### (b) Minor Irrigation Schemes

The minor irrigation schemes which are to spill over to the Seventh Plan number 14, and are spread over 10 development blocks. Out of these 14 schemes, 10 are located in irrigationally poor areas. On completion, these minor irrigation schemes will create additional potential of 4371 ha.

## New Schemes

### (a) Medium Irrigation Schemes

Medium irrigation schemes are proposed to be taken up in Baderajpur, Bhopalpatnam, Geedam and Bhanupratappur development blocks. Except Bhopalpatnam all other development blocks fall in the category of blocks which possess created irrigation potential of less than 5 per cent of their net sown area and are below half the level of state irrigation average. Scheme wise details are provided below :

#### (i) Pidhapal Irrigation Scheme

The project is located in Baderajpur development block which is deficient in irrigation infrastructure with having a created potential level of about 5 per cent of net sown area.

The site for the location of the project has been identified and necessary detailed survey carried out. The project is designed to create irrigation potential of 3845 ha. The anticipated cost of commissioning the project for use, with a provision for escalation has been estimated at Rs. 1288.00 lakh. It will make use of 34.267 Mm<sup>3</sup> of the



water resource available in the district. The creation of this additional potential will raise the level of irrigation infrastructure availability. It will make use of  $34.26\text{Mm}^3$  of the water resource available in the district.

**(ii) Madse Irrigation Scheme**

Irrigation potential so far created in Geedam development block is about 3.0 per cent of its net sown area. The block is located physically at a point where all round development is expected fast. It is likely to become a major growth centre of the area owing to its nearness to Bodhghat project.

Madse Irrigation project has been duly surveyed and the proper site located. The scheme has been designed to irrigate 2280 ha. using  $20.31\text{Mm}^3$  of the water resource. The estimated cost of the scheme on completion would be Rs. 764.00 lakh. The additional potential when created will bring the block at irrigation potential level of 22.3 per cent of net sown area.

**(iii) Karnanalla Irrigation Scheme**

Bhanupratappur development block has a created irrigation potential of about 4.6 per cent of its net sown area and falls in the category of deficient blocks in matters of irrigation. Being located in the northern region of the district it is relatively more

open to the healthy agricultural influences spreading from the neighbouring developed blocks. The addition to its existing irrigation potential is expected to generate faster adoption of improved agricultural practices.

The Karna Nalla irrigation project has been suitably surveyed and site for the project located. The scheme is designed to irrigate 2896 ha. and is likely to use up 21.34 Mm<sup>3</sup> out of the total water resource. The scheme when completed is estimated to cost Rs. 802.00 lakh. The additional potential created on the completion of the project will raise the potential level to 20.7 per cent of net sown area.

The new proposed medium irrigation schemes will combinidly create a potential capable to irrigate 9021 ha. The details are shown below :

Block	No. of schemes (No.)	Potential to be created(ha.)	Water use (Mm <sup>3</sup> )	Anticipated cost (Rs. lakh)
1	2	3	4	5
Baderajpur	1	3845	34.26	1288.00
Geedam	1	2280	20.31	764.00
Bhanupratappur	1	2896	21.34	802.00
	3	9021	75.91	2854.00

#### (b) Minor Irrigation Schemes

Minor Irrigation Schemes are proposed to be taken up in 25 development blocks during the Seventh Plan period. Out of these development blocks majority belong to highly deficient and deficient categories. There are only two development blocks i.e. Charama and Sarona which have a potential capable of irrigating more than 18 per cent of their respective net sown area. Assuming an efficiency of about 60 per cent in utilisation of the potential, which is not the case at present, these two development blocks are also not having excessive potential. By and large these proposed schemes cover almost all the blocks deficient in irrigation potential. The level of irrigation percentage of the State has been taken to be the norm for determining irrigation backwardness of development blocks of the district. If the development block in the district has lesser created irrigation potential then that block has been taken to be backward and the degree of backwardness has

been determined by the distance from the State irrigation level. Based on this assumption the development blocks of the district have been categorised as highly deficient, deficient, less deficient, average and above average. Accordingly three development blocks viz., Abujhmar, Bastanar and Kati Kalyan are categorised as highly deficient since their availability of created irrigation potential is zero. Another thirteen blocks have some potential created but it is less than the half of the level of State irrigation percentage. Three blocks are categorised as less deficient, four blocks are near about average and two are fairly above the average, the average being the irrigation percentage of the State.

During the Seventh Plan 64 minor irrigation schemes have been proposed of which about fifty nine per cent have been allotted to the blocks falling under highly deficient and deficient categories, about 14 per cent each to less deficient and average categories and about 13 per cent to the above average categories. The survey work for these schemes has been completed, except the five in Abujhmar and Bastanar blocks. These are being surveyed. These schemes when completed will create a potential for irrigating 23757 ha. of land. The details of these schemes are shown below :

Sl.No.	Block	No.of schemes (No.)	Potential to be created (ha.)	Water use (Mm <sup>3</sup> )	Anticipated cost (Rs. lakh)
1	2	3	4	5	6
<u>Highly deficient</u>					
1.	Abujhmar	4	2180	18.35	767
2.	Bastanar	1	1255	10.57	422
3.	Kati Kalyan	2	359	2.74	102
		7	3794	31.66	1291
<u>Deficient</u>					
4.	Makdi	1	255	2.15	74
5.	Koilibeda	3	1288	10.70	391
6.	Bijapur	4	936	7.75	277
7.	Usoor	6	2901	23.50	684
8.	Durgkondal	1	202	1.55	59

1	2	3	4	5	6
9.	Kuakonda	3	522	4.18	150
10.	Bhairamgarh	1	132	1.01	30
11.	Geedam	3	630	5.11	198
12.	Pharasa gaon	1	304	2.56	93
13.	Bhanupratappur	4	863	12.97	395
14.	Jagdapur	1	121	0.93	35
15.	Sukma	2	502	3.99	146
		30	8656	76.40	2532

Less Deficient

16.	Antagarh	3	1698	14.30	512
17.	Kondagaon	4	1187	9.92	355
18.	Kanker	2	411	3.25	119
		9	3296	27.47	986

Average

19.	Tokapal	1	500	4.21	153
20.	Keshkal	2	1215	10.75	370
21.	Konta	3	800	6.77	239
22.	Narayanpur	3	2194	18.47	686
		9	4709	40.20	1448

Above Average

23.	Sarona	6	2762	23.13	760
24.	Charama	3	540	4.72	157
		9	3302	27.85	917
<b>GRAND TOTAL :</b>		<b>64</b>	<b>23757</b>	<b>203.58</b>	<b>7174</b>

The minor irrigation schemes proposed above for the Seventh Plan are estimated to cost Rs. 7174.00 lakh including the price escalation factor over the Plan period. These schemes are likely to utilise 203.58 Mm<sup>3</sup> of water from the available water resource of the district.

The entire set of proposals for the construction of medium and minor irrigation projects during the Seventh Plan in Bastar district are

summarised and presented in the table below :

Nature of the schemes/ Category of projects	No. of schemes	Potential to be created (ha.)	Anticipated cost (Rs. lakh)
1	2	3	4
<u>Continuing Schemes</u>			
Medium	2	9250	165.41
Minor	14	4371	164.87
	16	13621	330.28
<u>New Proposed Schemes</u>			
Medium	3	9021	2854.00
Minor	64	23757	7174.00
	67	32778	10028.00
<b>GRAND TOTAL:</b>	<b>83</b>	<b>46399</b>	<b>10358.28</b>

The first phase of translating the ten year irrigation perspective for Bastar district is expected to result in the creation of an irrigation potential of 46399 ha. from departmental sources at a total cost of Rs. 103 58 crore.



## POWER

### 1. General Review

Availability of adequate power could be a crucial factor for development. In an agrarian economy like that of Bastar it can transform the rural scene and can become the harbinger of economic change. The district is no doubt backward but it has immense potentialities for development and it has waited long enough to be stirred out of its slumber. These potentialities include hydel power resources available in the district.

The Tenth Annual Power Survey Committee has assessed the likely power requirements of the State by the end of 1988-89, the penultimate year of the Seventh Five Year Plan of the State. According to these estimates peak energy demand in the State at the end of 1988-89 would be for 3782 MW and corresponding energy requirement would be 22200 m.units. The committee also estimated the peak demand for 1983-84 which shows the peak demand as 2123 MW, while the peak availability has been estimated to be 1413 MW. There is thus a short fall of 710 MW at the 1983-84 level. Assuming that the commissioning of projects targetted for 1984-85 takes place as scheduled the likely peak load demand of 2454 MW in 1984-85 will not be met and there would be a significant short fall at the end of Sixth Five Year Plan. It is further estimated that inspite of making available power from all Thermal and Hydel projects identified and proposed upto 1988-89 the shortage would still be significant.

As against the estimates of the Tenth APS, installed capacity in Madhya Pradesh by the end of 1982-83 was 1840.5 MW which has gone up to 2050.5 MW (provisional) in 1983-84. The peak availability is 1300 MW while the peak demand is 1700 MW and there is thus a gap of 400 MW between the peak demand and peak supply. By the end of 1984-85 the position is expected to improve but there is a likelihood of supply shortage to the extent of 300 MW to 400 MW at the peak demand level.

Power development in the State has also to be viewed in the context of rapid extension of power lines in the rural areas. There is a

possibility of cent per cent coverage of the rural area under the rural electrification programme. Thus, besides the demand arising from a higher priority given to agriculture for lift irrigation schemes, small and cottage industries, the demand for power for various general uses in the context of total rural electrification would be considerable. By the end of 1982-83 rural electrification programme has covered 32,838 villages in the State and by the end of Sixth Five Year Plan the number of villages is likely to be 39901. Similarly, 3,93,123 pump sets and tubewells have been energised upto 1982-83 and the likely number by the end of 1984-85 is expected to be 4,58,693.

The Eleventh Annual Power Survey has estimated peak level power demand in Madhya Pradesh to be 3868 MW by the end of Seventh Plan with a corresponding energy requirement of 2238 m. units which would be needed as a result of various development efforts in all sectors of the economy. This situation indicates that additional power generation projects have to be taken up in hand. The installation of hydel power stations in the State appears to be the best answer. Further, some of the characteristics of the loads in the State system are that a wide seasonal variation in the demand as also in the pattern of consumption is noticed. With the completion of vast rural electrification programme in the State the load factor would further affect the pattern of seasonal variation. It is estimated that seasonal variation due to irrigation load alone would be about 400 to 500 MW. The load duration curve for the State system as worked out for 1983-84 indicates that between the average load and the peak load, there is a variation of about 500 to 600 MW. Such large fluctuations in the load curve could be met to a great extent without imposing severe restrictive measures by installing Hydel Power stations designed essentially for peaking supply.

#### **Hydel Potential**

This is the situation where hydel potential of Bastar can be utilised for the benefit of the State Hydel Power. Bodhghat Hydel Project on Indrawati river assumes importance in this context. The project is designed for 500 MW power generation with the assistance of World Bank. The agreement for World Bank assistance has recently been signed and the

work on the project is to be stepped up soon. By the time Bodhghat Project is completed the loads of railway traction in the district, Iron ore mining and other area loads may be of the order of 100 MW. The bulk of the power from the project, apart from drawing peaking assistance would be transmitted to Bhilai Steel Project which is fast developing into a major power consuming centre.

Indrawati basin has a large potential for hydel power generation and the total potential is estimated to be more than 3600 MW. The following power projects have been identified from which power generation would eventually be made available :

Project	Development Block
Bodhghat	Geedam
Chitrakote	Lohandiguda
Noogar I	Bhairamgarh
Noogar II	Bhopalpatnam
Kutru I	Bhairamgarh
Kutru II	Bhairamgarh
Matner	Lohandiguda
Bhopalpatnam I	Bhopalpatnam
Bhopalpatnam II	Bhopalpatnam
Kotri-Nibra	Bhopalpatnam

The estimated power potential of these projects either exclusively or as a share will be available to the State. The integrated operation of this hydel potential available from the Indrawati basin along with predominantly thermal generation system at Korba, Amarkantak and Singrauli will enable optimum utilisation of the power generation potential.

Apart from the potential of Indrawati basin the district has additional hydel potential for generating incidental power on small rivers owing to the falls of water of exploitable heights due to mountaneous topography. Such generation of incidental hydel power would be for limited period in a year but in some cases it may be possible to generate power



throughout the year by constructing small dams. A few sites have been identified for generating incidental hydel power in the mountaneous and remote areas of the district with a view to providing power locally for irrigation and small forest based seasonal industries. The generation and utilisation of such power locally would permit grid system power to be diverted to other needy areas. These sites are located in Jagdalpur, Narayanpur and Bijapur tehsils of the district.

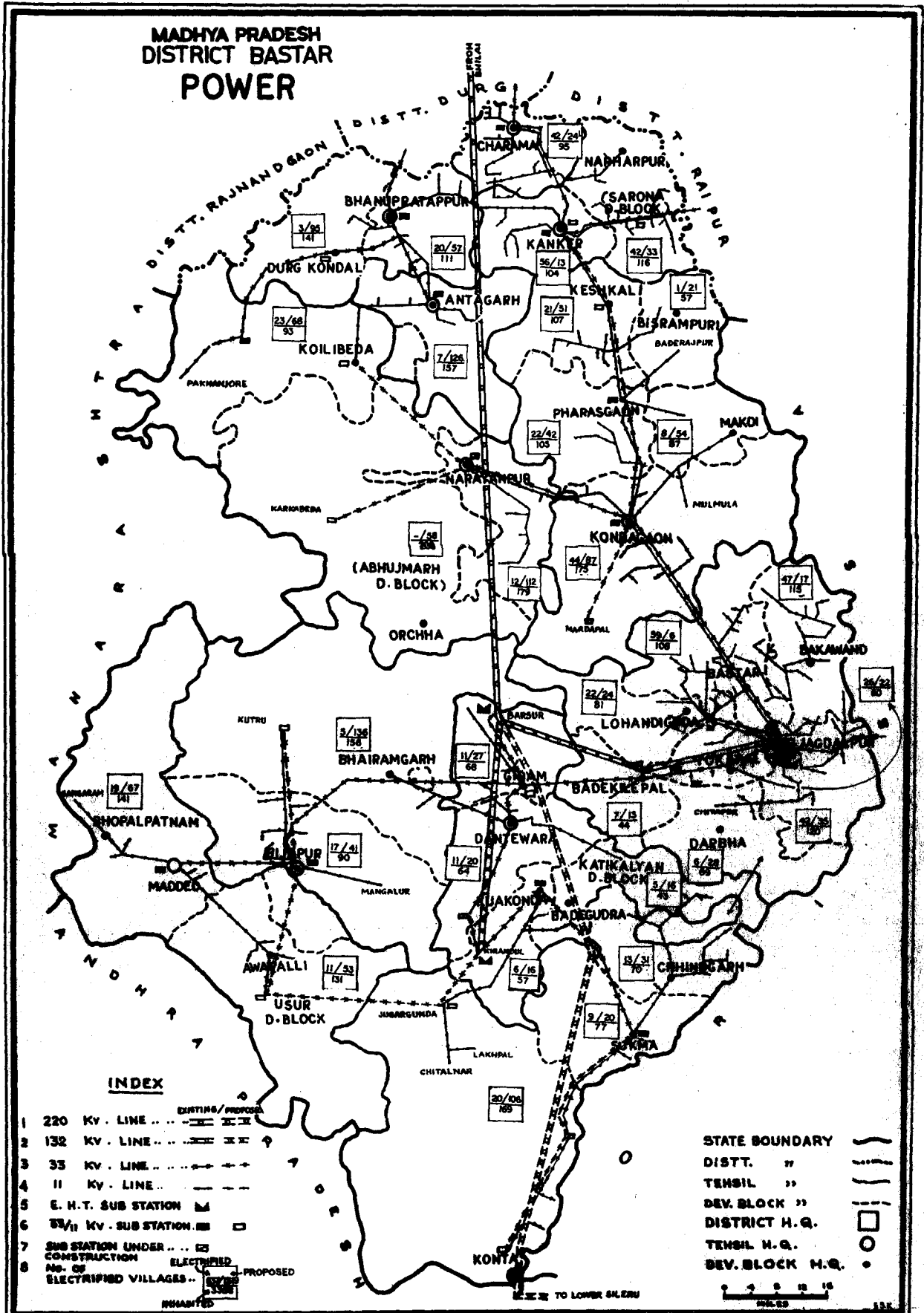
Thus, by harnessing hydel power potential of Indrawati basin and other rivers, it would be possible to enhance the installed capacity of the State by about 1700 MW which will reduce the necessity of load shedding considerably. Further, it has been considered necessary to have a thermal-hydel mix of the ratio of 6:4 to optimise the working of the system and in this context exploitation of hydel power potential of the district would considerably improve the existing 9:1 thermal-hydel mix of the State.

#### Rural Electrification

Rural electrification programme in Bastar has yet to become a potent growth agent. Out of the 3388 inhabited villages in the district 637 villages have been electrified upto March 1983. Jagdalpur was connected with grid supply from Orissa via Jaipur through a 33 KV line in 1962. During the same year Bhilai Barsur line was completed. In late sixties Jagdalpur was connected with Barsur and the Barsur-Kirandul line was also completed. Bhanupratappur was connected by Balod-Bhanupratappur line but subsequently it was hooked with Kanker in 1968. Electricity reached Konta and Bijapur through diesel power stations during the period 1968-70. Presently, all tehsil headquarters and 30 development block headquarters out of 32 have been electrified and villages spread over thirty-one development blocks have been provided with some power infrastructure. The district has three towns and all of them have been electrified. Yet the level of village electrification in the district by the end of March 1983 remained only at 18.8 per cent as compared to the State average of 46.3 per cent.

This level itself is sufficiently low but inter-block disparities are more significant. Development blocks range from having no village electrified to as many as 55 per cent of the villages of the block. The

# MADHYA PRADESH DISTRICT BASTAR POWER



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development blocks falling on the trunk road from Raipur to Jagdalpur are mostly those which have high percentage of villages electrified.

Block	No.of inhabited villages	No.of villages electrified	Percentage
Charama	95	42	44.2
Kanker	104	56	53.8
Keshkal	107	21	19.6
Pharasgaon	105	22	20.9
Kondagaon	175	44	25.1
Bastar	108	59	54.1
Jagdalpur	120	42	35.0

Similarly, development blocks falling on Jagdalpur Geedam Bhairamgarh road link are also having significant number of villages electrified. They are :

Tokapal	60	26	43.3
Lohandiguda	81	22	27.1

It will be seen that development blocks which have better communication and are situated on the path of transmission lines are better served. Two more development blocks viz., Sarona and Bakawand, the former in the north and the later in the centre adjoining Kanker and Bastar development blocks respectively are also better placed in regard to the percentage of villages electrified. Sarona has 36.2 per cent and Bakawand 40.8 percent villages electrified. In the southern region only Bijapur development block has 18.8 per cent of the villages electrified. Bhanupratappur development block in the north has about 18 per cent villages electrified. These all development blocks are either equal to the district average of villages electrified or are higher. The rest of the blocks are below the district average. The analysis brings out this fact to the fore that western, north western, southern and south-eastern regions of the district are poorly placed in terms of the distribution of power infrastructure. The villages electrified in the district

are mostly thickly populated villages by Bastar standards. The position is given in the table below :

Population size	Total No. of Villages electrified	Percentage 3 to 4
1	2	3
Having more than 1000 persons	307	65.8
500-1000	634	35.8
Less than 500	2447	8.5
	3388	18.8

It is estimated that electricity has reached out to serve about 26 per cent of the rural population.

Bastar District has got a very important place on the power map of Madhya Pradesh. The erection of 220 KV line from Bhilai to Barsur was completed in March '68. The line was however, initially charged at 132 KV. A 220 KV substation subsequently established at Barsur was commissioned in January '80 and simultaneously the line was charged at 220 KV. The erection of 132 KV line from Barsur to Kirandul was completed in December '67 and the 132/33 KV substation at Kirandul was commissioned in March '68. This transmission system was developed mainly to meet the power requirement of Iron ore mines of National Mineral Development Corporation at Bailadilla. The erection of another 132 KV line from Barsur to Jagdalpur was completed in June '76 and a 132 KV substation was commissioned at Jagdalpur in May '78 in order to meet the growing power requirement in Jagdalpur area. Second circuiting of Barsur-Kirandul line and Barsur-Jagdalpur 132 KV line was completed in 1979. Second circuiting of Bhilai-Barsur 220 KV line was completed in July '80 to meet the power requirement of railway track electrification of Waltair-Kirandul section on South Eastern Railway. In addition to power supply for railway electrification, the double circuiting of Bhilai-Barsur 220 KV line was planned to fit in with the future development of hydel projects in the area. Tapping have been taken from Barsur-Jagdalpur and Barsur-Kirandul 132 KV lines for supply of power to 7 sub-

stations of the Railways, namely; Tokapal, Dillimili, Geedam, Bhansi, Kawargaon, Adwal and Amaguda.

An inter-state 220 KV line also exists between Barsur and Lower Sileru in Andhra Pradesh. This line was completed in January '82. Power assistance to M.P. whenever required is available from Andhra Pradesh through this link. Recently the Planning Commission has given its approval for taking up second circuiting of this inter-state line so that Madhya Pradesh could avail the surplus power which is likely to be available in Southern Region during the monsoon.

There are 3388 inhabited villages in Bastar District and it ranks lowest so far as the status of electrification is concerned. At the end of Fifth Five Year Plan i.e., on 31st March '80 the number of villages electrified was 362 which is 10.7 per cent of the total villages in the district. It is only in the recent past that the Rural Electrification in the district has gained some momentum. A total of 637 villages have been electrified upto March '83 and the electrification level achieved is thus about 18.84 per cent.

The present position of blockwise level of electrification as on 31st March '83 is indicated below :

S.No.	Name of Block	Total inhabited villages	Villages electrified as on 31.3.83	Percentage of villages electrified
1	2	3	4	5
1.	Bastar	108	59	54.6
2.	Jagdapur	120	42	35.0
3.	Bakawand	115	47	40.8
4.	Bastanar	44	7	15.9
5.	Lohandiguda	81	22	27.2
6.	Tokapal	60	26	43.3
7.	Darbha	69	6	8.7
8.	Keshkal	107	21	18.7
9.	Makdi	87	8	9.1
10.	Kondagaon	175	44	25.1
11.	Pharasgaon	105	22	20.9
12.	Baderajpur	57	1	1.7

1	2	3	4	5
13.	Bhanupratappur	111	20	18.0
14.	Durgkondal	141	3	2.1
15.	Kanker	104	56	53.8
16.	Charama	95	42	44.2
17.	Sarona	116	42	36.2
18.	Konta	169	20	11.2
19.	Sukma	77	9	11.7
20.	Chhindgarh	70	13	16.9
21.	Narayanpur	169	12	7.1
22.	Antagarh	157	7	4.5
23.	Kpilibeda	93	23	24.6
24.	Abhujmar	208	-	-
25.	Dantewada	64	11	17.2
26.	Geedam	68	11	16.1
27.	Kuakonda	57	6	12.2
28.	Katikalyan	43	5	11.6
29.	Bijapur	90	17	18.8
30.	Bhairamgarh	156	5	3.2
31.	Bhopalpatnam	141	19	13.5
32.	Usoor	131	11	8.4
GRAND TOTAL :		3388	637	18.8

The Rural Electrification Corporation, New Delhi has so far sanctioned 20 schemes for electrification of 1186 villages in the district at a total cost of Rs. 856.51 lakh out of which 434 villages were electrified till March '83 under these schemes. These schemes have already completed their period of operation and as such have been closed. New schemes for the remaining villages have been sanctioned.

It is expected that by the end of Sixth Five Year Plan the district would achieve electrification of 25 per cent of villages. For this purpose, additional 213 villages are required to be electrified by the end of 31st March '85. This is, however, subject to the permission

for clearance of forest trees since transmission lines are to be laid across rich and dense forest of the district. The likely position with regard to village electrification programme at the end of Sixth Five Year Plan is summarised in the table below :

S.No.	Name of Block	Total inhabited villages	Villages expected to be electrified upto March '85	Expected level of electrification at the end of March '85
1	2	3	4	5
1.	Bastar	108	71	64.5
2.	Jagdapur	120	44	38.9
3.	Bakawand	115	59	54.6
4.	Bastanar	44	21	42.9
5.	Lohandiguda	81	28	37.9
6.	Tokapal	60	27	38.6
7.	Darbha	69	20	29.4
8.	Keshkal	107	21	20.4
9.	Makdi	87	9	10.0
10.	Kondagaon	175	44	23.5
11.	Pharasgaon	105	24	25.5
12.	Baderajpur	57	19	33.3
13.	Bhanupratappur	111	21	18.9
14.	Durgkondal	141	5	3.5
15.	Kanker	104	58	57.4
16.	Charama	95	44	45.4
17.	Sarona	116	48	41.4
18.	Konta	169	24	12.9
19.	Sukma	77	18	33.3
20.	Chhindgarh	70	22	28.9
21.	Narayanpur	169	13	7.3
22.	Antagarh	157	8	4.2
23.	Koilibeda	93	48	28.9
24.	Abhujmar	208	5	5.6
25.	Dantewada	64	27	40.3
26.	Geedam	68	21	30.4

1	2	3	4	5
27.	Kuakonda	57	18	36.7
28.	Katikalyan	43	17	36.2
29.	Bijapur	90	21	23.9
30.	Bhairamgarh	156	9	4.4
31.	Bhopalpatnam	141	22	17.3
32.	Usoor	131	14	14.6
GRAND TOTAL :		3388	850	25.1

By the end of Sixth Five Year Plan possibly about 25 per cent villages in the State will be electrified. The Plan provision during Sixth Plan for rural electrification is Rs. 160.00 crore and it is contemplated that with a likely allocation of Rs. 176.00 crores for rural electrification programme during the Seventh Five Year Plan, it will be possible to electrify 70 per cent of the villages in the State by the end of the Seventh Five Year Plan. It is, therefore, felt that attempts should be made to achieve equal level i.e., 70 per cent village electrification in each of the development blocks of Bastar District also by the end of the Seventh Plan.

## 2. Approach and Strategy

Bastar district is rich in natural resources but its present utilisation is far from satisfactory. The efforts made in the direction of bringing a socio-economic change through various schemes aimed at altering the present mode of production and consumption in the district has already prepared a background and the tribal is expectant although he does not fully understand or cannot articulate the surfacing desire. The integrated sectoral development programme, when implemented, is expected to generate mutually dependent sectoral relationships which can be sustained only by adequate availability and consumption of power. However, energy requirements for agriculture, industry, commerce and domestic use, are not expected to increase substantially thus indicating poor returns on investments. Peculiar conditions of the district, such as undulating topography, inter village and even intra village spatial distances are going to contribute to higher costs of creating the infrastructure, yet keeping in view the time and resource constraints in creating the infrastructure the programme for



making electricity energy available cannot wait for the proper demand to generate. These proposals have, therefore, been formulated keeping in view both the levels of demand generation and spatial considerations. The aim is to ensure the development of power infrastructure capable of feeding various micro regions of the district either by generating power locally through natural forces available in the district or by creating a network of transmission and sub-transmission lines for importing power from outside. The objectives set to be achieved are (i) to exploit the latent incidental power on rivers and rivulets(ii) to meet the requirements of prospective big and small industries and (iii) to electrify 1519 villages in order to attain 70 per cent electrification in the district.

### 3. Plan Proposals

#### 1. Generation

Hydel power generation projects as identified earlier are proposed to be taken up on a priority basis. These projects are further subdivided into (a) major projects and (b) mini or micro projects.

##### (a) Major Projects :

Major hydel power generation projects in Indrawati basin along with their estimated power potential are given below :

Project	Potential (MW)	Location
1	2	3
1. Bodhghat	500	Barsur
2. Chitrakote	45	Konder
3. Nagur I	150	Nagur
4. Nagur II	600	Mandi Mandarey
5. Kutru I	150	Parkeli
6. Kutru II	150	Gumalnar
7. Matner	80	Madner
8. Bhopalpatnam I	1225	Mati-Marka
9. Bhopalpatnam II	600	Inchapalli
10. Kotri-Nibra	150	Kodor

Bodhghat project is located at about 8 Km. from Barsur where work on the project has already started. The total cost of the project is estimated to be Rs. 179.00 crore. This project has been taken up with World Bank assistance for which an agreement has been signed recently. During the last three years i.e. from 1981-82 to 1983-84 anticipated expenditure on the project was about Rs. 5.65 crore and during 1984-85 an amount of Rs. 26.10 crore has been proposed to be spent. Power installations proposed for the project comprise five units of 100 MW each. On the basis of the hydel station operating essentially as a peaking source the evacuation facilities must be made suitable for the full capacity of 500 MW. The surplus power at Bodhghat and peaking assistance drawn from Andhra Pradesh is proposed to be transmitted to Bhilai sub station after meeting the needs of the district. The distance from Barsur to Bhilai is about 225 Km. and therefore transmission capability will have to be augmented. Present transmission capability of power with a 220 KV line would not be more than 300 MW. Considering initially, power availability from Bodhghat hydel project together with peaking assistance from Andhra Pradesh it is proposed to lay a 400 KV line from Barsur to Bhilai.

It is also proposed to take up Bhopalpatnam hydel project for which a provision of Rs. 50.00 lakh has been made during 1984-85. Bhopalpatnam hydel project is an inter-state project from where 38 per cent of power generation would fall in the State's share.

The rest of the projects are proposed to be taken up during the Seventh Plan period with a view to completing them during the early part of the Eighth Plan. Generally hydel power generation projects have a gestation period of 7 to 8 years and it will be advisable to take them up right now so that the benefits are available during the Eighth Plan period.

The cost estimates of these projects are given below :

Project	Cost (Rs. in crore)
1. Bodhghat	179.00
2. Bhopalpatnam I )	221.61(State's share)
3. Bhopalpatnam II)	
4. Kutru I )	113.16
5. Kutru II )	
TOTAL :	<u>513.77</u>

The rest of the projects are in the formative stage and the likely costs have not been worked out.

**(b) Mini and Micro projects**

There are a few ideal sites for pumped storage schemes due to the proximity of the high level upper reservoir sites on fringe of the power project reservoirs. The ratio of height to the length of the water conductor system is small in these cases which makes the pumped storage scheme technically viable and financially economical. One such site has been identified near Kodur Hydro electric project on the Kotri river where the difference in elevation of upper and lower reservoir is about 300 meters and horizontal distance between lower and higher reservoir is hardly 1 Km. Further investigations and studies will certainly indicate the possibilities of locations of more sites for pumped storage schemes using the planned hydro electric project reservoir on the Indrawati as lower reservoir. The schemes for harnessing incidental power are estimated to cost between Rs. 16,000.00 to Rs. 18,000.00 per KW. The survey and investigation of actual schemes for small/mini hydel power generation has to be taken up to know the potential of incidental hydel power. However a list of incidental power projects based on the studies of topographical maps of the district are proposed below which may be taken up during the Seventh Plan.

Name of rivers and nalas	Location near village	Approximate power generation KW
Huchuri Nadi	Huckukot	25
Madin Nadi	Kongali	300
Kangar River	Tirathgarh	1000
Chakabaka Nallah	Dulamma	500
Ogway Nallah	Pharasbera	300
Chinta Vagu	Chinna Sonakam	2000

The schemes for harnessing incidental power are estimated to cost between Rs. 1600.00 to Rs. 1800.00 per KW. The estimated requirement of funds for the proposed 6 mini and micro hydel schemes would be as follows :

Scheme	Approximate cost (Rs. in lakh)
Huchuri Nadi	4.50
Madin Nadi	54.00
Kangar River	120.00
Chakabaka Nallah	90.00
Ogway Nallah	54.00
Chinta Vagu	24.00
<b>TOTAL</b>	<b>346.50</b>

#### Rural Electrification :

For attaining 70 per cent level of electrification in each of the blocks by the end of Seventh Five Year Plan, 1519 number of villages would be required to be electrified during the Seventh Plan period and a total of about 4443 Kms. of 11 KV lines would be required to be laid. On an average 2.85 Kms. of 11 KV line will be laid for electrifying one village and the cost of electrification per village with the 1982-83 cost data works out to Rs. 1.00 lakh. The blockwise details are as under :

S.No.	Name of Block	No. of villages to be electrified to attain 70 per cent electrification during Seventh Plan	Length of 11 KV line required (Kms)
1	2	3	4
1.	Bastar	6	18
2.	Jagdapur	35	118
3.	Bakawand	17	50
4.	Bastanar	13	40
5.	Lohandiguda	24	76
6.	Tokapal	22	64
7.	Darbha	28	86
8.	Keshkal	51	155
9.	Makdi	54	162
10.	Kondagaon	87	247
11.	Pharasgaon	42	127

1	2	3	4
12.	Baderajpur	21	60
13.	Bhanupratappur	57	170
14.	Durgkondal	95	239
15.	Kanker	13	37
16.	Charama	24	68
17.	Sarona	33	94
18.	Konta	106	295
19.	Sukma	20	66
20.	Chhindigarh	31	97
21.	Narayanpur	112	319
22.	Antagarh	126	349
23.	Koilibeda	68	194
24.	Abhujmar	58	215
25.	Dantewada	20	58
26.	Geedam	27	84
27.	Kuakonda	16	49
28.	Katikalyan	16	46
29.	Bijapur	41	117
30.	Bhairamgarh	136	388
31.	Bhopalpatnam	67	198
32.	Usoor	53	157
Grand Total :		1519	4443

The cost escalation of construction materials cannot be ruled out. As such keeping in view the minimum cost escalation of about 10% every year compounded, the total cost of electrification per village during the period 1985-86 to 89-90 would vary from Rs. 1.33 lakh to Rs.1.95 lakh. In order to electrify 1519 villages during Seventh Five Year Plan to attain 70% level of electrification, it would be necessary to electrify on an average 304 vil- lages per year. This would mean a total investment of Rs. 24.67 crores. The details are shown in the following table :-

S.No.	Year	Cost per village	Total villages	Total (Rs. in lakh)
1	2	3	4	5
1.	1985-86	1.33	304	404.32
2.	1986-87	1.46	304	443.84
3.	1987-88	1.61	304	489.44
4.	1988-89	1.77	304	538.08
5.	1989-90	1.95	303	590.85
Total :			1519	2466.53 or say 2467.00

With the laying of 11 KV lines to attain 70 per cent level of electrification, it would be necessary to supplement the system with 33 KV lines and 33/11 KV substations costing about Rs. 2.50 crore in order to maintain proper voltage regulation in the areas. It may thus be necessary to lay about 300 kms. of 33 KV lines and to install 16 substations each of 0.63 MVA capacity.

Thus an outlay of Rs. 27.17 crore would be required to achieve 70 per cent level of village electrification in each of the blocks. In the above proposal all the villages above 1000 population group would be electrified.

#### Transmission Development

Investments in various sectoral development programmes are likely to generate power demand in various parts of the district. The likelihood of agrobased, forest based and mineral based industries, such as paper, news print, hard board, plywood, pelletisation plant, rice mills, fruit juice extraction and preservation plants etc. to be set up in the district has become a palpable possibility. These industries will require power and to meet the demand of these and such other industries it is necessary to erect about 100 Km. of 132 KV lines and to establish two 132/33 KV. 20 MVA sub station in the area. The likely cost on these schemes would be Rs. 425.00 lakh.

The outlay for the entire power plan for Bastar district during the Seventh Five Year Plan would be as follows :

		(Rs. in lakh )
1.	<u>Generation</u>	
	Mini and micro projects 6 no.	3.46
2.	<u>Rural Electrification</u>	
	Village electrification 1519	24.67
	33 KV lines (Km.) 300 )	2.50
	33 KV sub-station 16 )	
	Transmission system	4.25

The costs on account of major hydel projects have not been included in the proposals for the district plan for Bastar as they ought to form part of the State Plan both from the point of view of plan formulation and its implementation. The outlay, therefore, for the special plan component would be limited to Rs. 34.88 crore.



## COOPERATION

### 1. General Review

Economic decisions by and large are taken by individuals everywhere but they are influenced and determined to a great extent by similar decisions of other members of the society. Due to such a built-in interdependence the implementation of individual decisions cannot take place in isolation. The whole process of taking decisions and implementing them thus directly or indirectly becomes a group decision and group implementation with a very limited scope for the freedom of choice. Traditional societies and specially tribal societies operate by consensus within the traditional frame work of the society or the community or clan as a whole and unfettered decisions of individuals are not generally operative. The individual in these societies has ingrained tendency to curb individual freedom for the bigger cause of community and acts in concerted unison with other members of the community to achieve individual and community goals. These characteristics are boldly manifested in people where community appropriation of assets is in vogue, such as in Hill Marias of Abujhmar. In other communities where asset appropriation has assumed family lineage people are still within the community influence. "There is a sense of identity, one for all, all for one, among the Adivasis. Identification with one's community to the extent of being willing to die for it requires a degree of detachment from one's self which is hard to achieve. But the Adivasi has achieved it". (Noronha.) These characteristics of individual identification with the community in so large a measure make Adivasis admirably suitable for adopting a way of life co-operation professes. If their minds can be reached these ingrained proclivities of tribal people can become powerful aids in organising them into co-operative functional groups different from their present operational structure and for the benefit of the rural community through increased efficiency, productivity and incomes.

#### Rural Economy

Rural economy of Bastar was and to some extent is a closed

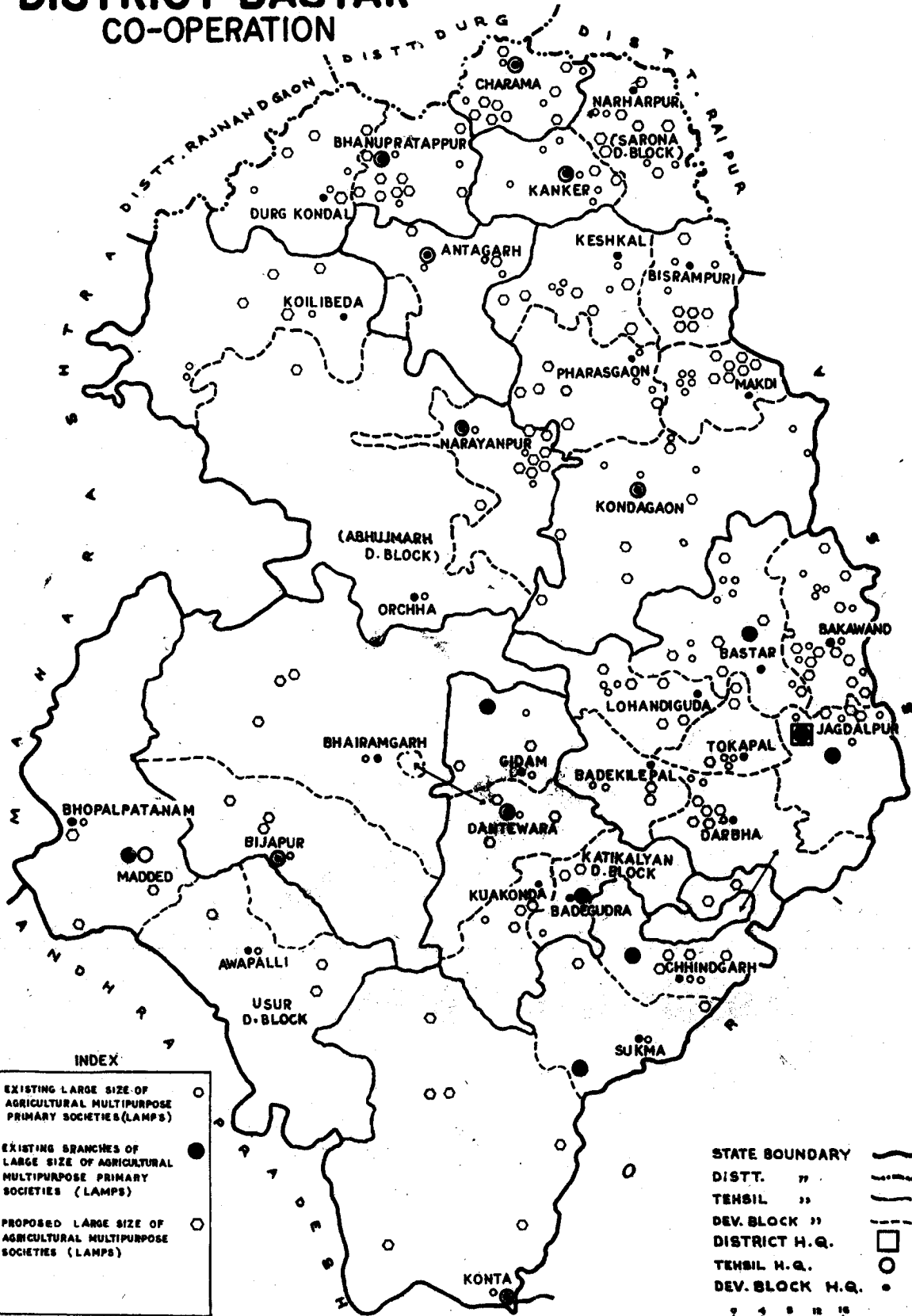


economy where transactions are limited to the village and community. However, a break through has been achieved over the past few decades. It is on record that utmost civilizing influence on tribals was first brought by the roaming Banjara who bartered consumer goods with the produce adivasis collected from the forest. With the growth of settled cultivation and diversification of produce the role of permanent trader came into existence who became the sole seller of articles which adivasis needed and sole purchaser of the produce tribals could offer. This trader to some extent monetised the tribal economy and became an intermediary between the producer cum gatherer of rural Bastar and the urban producer of consumer goods. Thus a situation what is generally termed as MM situation developed wherein buying and selling in highly imperfect tribal markets gave the trader the sole authority over the produce of the people and sale of goods to the people within his area of operation. This control was further strengthened by the extension of traders' role as a money lender which in due course of time decapitalised the tribals and fossilised the rural economy thereby keeping other outside contenders away from interfering with the tribal or rural market. The main instrument of exploitation was the ownership and control of capital which generally took three forms, viz., (a) liquid capital which was used for advancing loans to the people, (b) intermediate capital in kind such as seed, livestock, tools etc. for production process and salt, fuel, gur etc. for consumption purposes and (c) permanent capital such as ownership and control of processing units, storage capacity, transport facilities etc. These functions were appropriated by a single person in the earlier stages and subsequently were taken over by related families of these traders thus finally emerging as a class. They not only controlled the produce of the farmer cum gatherer but also the production process. They are still important and much of their importance is due to the help they receive from government and other agencies since they are the people who are considered progressive and who are willing to accept technical change. Consequently, their grip over the affairs of tribals has not decreased to any great extent except in semiurban areas where other classes of exploiter have entered into the fray. Lack of communication has further accentuated the malady.

### Technical Change

Rural economy of Bastar is a predominantly agro-forest based economy. Therefore, any attempt to promote rural development has to be via improving agricultural productivity and providing income generating opportunities based on forest produce. Changes in agricultural productivity and occupational structure are the outcome of technological changes. However, technological change without relevant institutional change would remain infructuous and would contribute to widen the gulf between the beneficiary and the deprived. These two have mutually interacting relationship and one cannot succeed without the other playing its proper role. Technological change implies physical and material improvements such as land improvement, use of improved and modern agricultural implements, HYV seeds, chemical fertilizers, electricity energy, irrigation and scientific management of crops. These changes involve higher investments and unless farmers are assisted adequately the benefits would go to the richer members of the rural society leaving the small and poor farmers high and dry. This is the situation where traditional rural institutions based on private enterprise are not suited to improve agricultural productivity with social justice. Here agricultural productivity has not only been taken to mean the measurable relationship between the output and the factors of production but in a wider context of what the increased productivity ought to do to the producer i.e. accrual and distribution of incomes made possible by higher productivity. Institutional change, therefore, becomes necessary both to bring and to sustain the technical change. Institutional change implies the replacement of sources of credit, restructuring of marketing organisations and realigning the control over capital and capital assets. Howsoever a good system may be devised the control of credit providing agency over production process and to some extent on its disposal cannot be fully eliminated. Assuming that the technical change is possible and that such a change will increase the aggregate income of the area then the major portion of additional income so generated will be appropriated by the credit giving institutions, marketing organisations and rural

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 TEHSIL BOUNDARY  
 DEV. BLOCK BOUNDARY  
 DISTRICT H.Q.  
 TEHSIL H.Q.  
 DEV. BLOCK H.Q.



capitalists, who in one way or the other would remain a party to the whole process. The cultivator, too would be hesitant to adopt any new technology if he believes that greater part of the value of the increased output would be taken away by others or that it would make his position insecure. The institutional change therefore has to be such which may involve the actual farmer in the decision making process regarding the quality and extent of technical change to be adopted and further with the processing and marketing of his produce.

### **Institutional Change**

One of the effective methods of promoting rural development is through a reorganisation of production techniques and rural produce markets. Farm output may be produced for self consumption or for a market not far away from the production site or for a wider market. Agricultural produce in Bastar is mostly for self consumption and a very insignificant part of the whole produce is meant for the nearby markets. In the former category food grains like sawa, kodonkutki, pulses, chillies and some ordinary spices are included and in the latter category are fruits and vegetables which are meant for the urban markets nearby. However, this is not uniformly true for all areas in the district, particularly to the areas in the north and some in the central parts where production for sale is being practised. In a sectoral development approach activities relating to the sector are taken care of by the agency concerned. The change and improvement in agricultural production techniques will be brought by agriculture extension agencies by providing the tribals reliable seed, adequate fertilizers and improved implements. However, as pointed out earlier, such agencies are prone to approach progressive minded people in the area since they are easier to be persuaded and far more capable than others to demonstrate the efficacy of improved techniques. The result is the concentration of more power in the already powerful persons of rural area. This situation too needs corrective measures. The approach to progressive people in the area for adopting new techniques of production is not entirely and necessarily undesirable and it should continue to be in operation but more emphasis has to be given to improve the productivity of small and marginal farmers who are otherwise deprived. To reach them directly and individually is a colossal task but to raise their

incomes is equally necessary. Here again reorganisation of these farmers into viable units becomes imperative with a view to making available modern inputs for raising farm productivity for sale and to ensure maximum share of the difference between the farm price of the produce and its market price to the tribals.

The solution of all these problems may be found in the joint participation of the people in the programmes of extension, learning and acquiring the expertise which the local trader possesses. Further, joint participation in the application of the expertise in the field of production, processing and marketing would enable them to free themselves from constrictions of money lenders and traders. This joint participation is institutionalised as a co-operative society where all members have equal opportunities to participate in the programmes of economic development. The foregoing discussion has established the need and scope of functions of co-operative institutions. However, the tribals are not adequately acquainted with the formation procedure of co-operative societies, nor are they equipped with necessary capital and expertise of business administration. They may respond to any call of cooperation provided the advantages of co-operative ventures are satisfactorily demonstrated to them. The approach should take positive form of explaining to them the benefits which they will derive and care should be taken not to arouse in them any animosity towards their present benefactors since this may alert their native intelligence and they may cling to tradition as a measure of safety rather than plunge into breakaway action on the slim strength of a hope. Attempts at changing their socio temperamental milieu therefore, should be gradual and supported by achievements. Failure of co-operative societies would do more harm to the development perspective in the district than any other policy since it is the only way to reach out to the small and marginal producers in rural areas. The prime need of these producers is capital and subsequently, proper price of their produce. Sphere of economic activity in Bastar tribal region is restricted generally to primary sector activities and as such they can be organised to cater for themselves in these fields primarily. Their needs as producers viz., timely availability of seeds,

fertilizers, pesticides, irrigation and power can be managed adequately by their own organisation. Similarly, their demands as consumers which at present are very meagre can also be met by the same organisation. In the initial stages these institutional changes cannot be brought about without full financial support and active participation of the government in matters of administration.

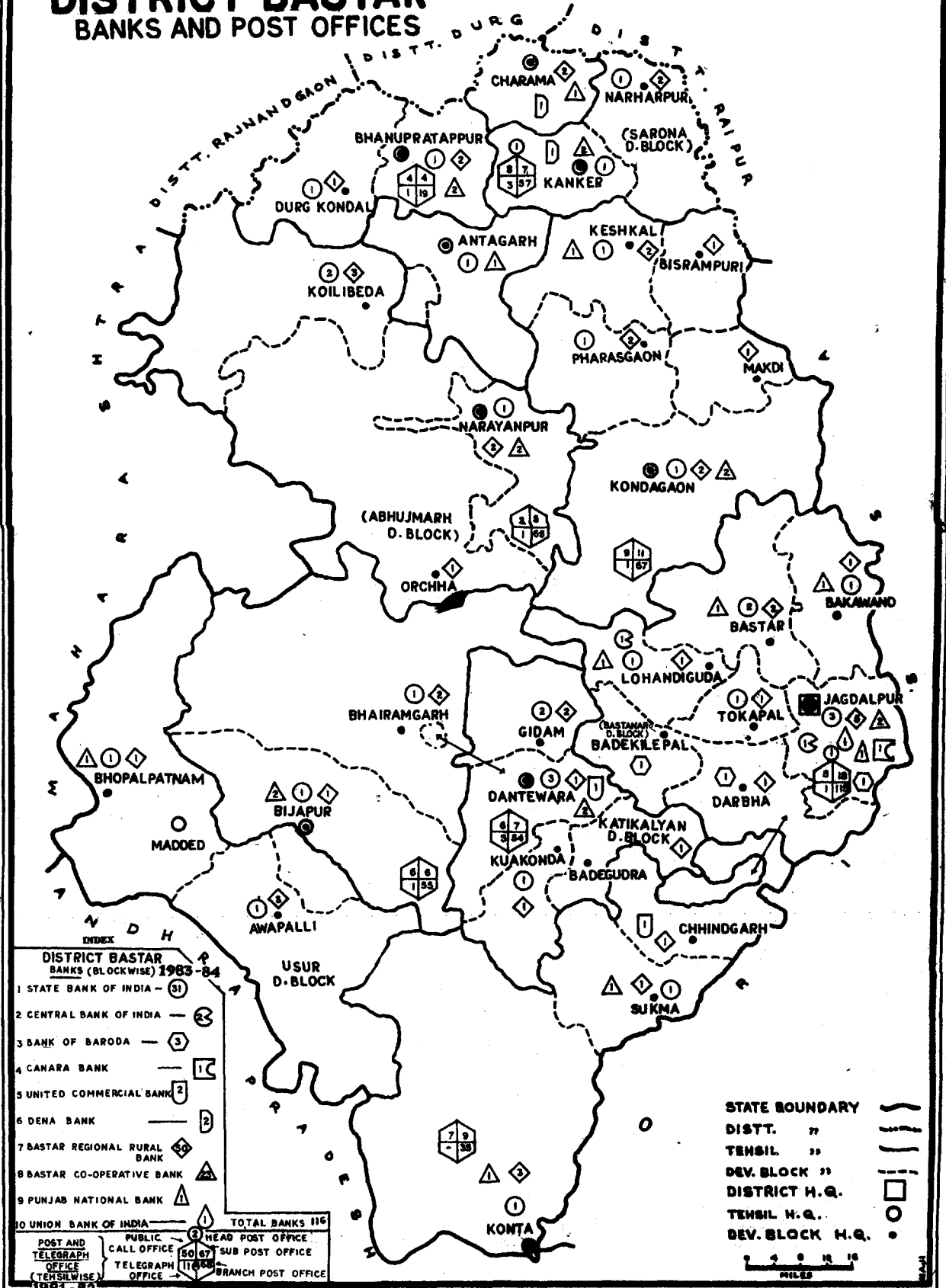
Co-operative movement in the district has been initiated as part of implementation of Five Year Plan. Presently there are 208 Co-operative societies of all types with a combined membership of 1,31,617. These do not include 10 Collective Farming Societies which are under liquidation. There are two district level bodies i.e. Central Cooperative Bank and Land Development Bank with a membership of 155 and 10,840 respectively. These Banks are key institutions which make other cooperative societies survive and function in the interest of the people. The District Cooperative Bank is responsible for providing short and medium term credit to agriculturists and functions through Large sized Agricultural Multi-purpose Cooperative Societies, Service Societies and Farmers Service Societies. Requirement of long term credit for agricultural development is met by the Land Development Bank. It is also operating for financing under ARDC refinancing scheme for minor irrigation. The District Cooperative Bank and Land Development Bank have 23 and 7 branches operating in the District. Apart from these two key cooperative institutions banking function in the district is also carried out by other banking institutions which have opened their branches at important centres in the district. Besides 23 branches of Cooperative Bank there are 50 branches of Rural Bank and 43 branches of other nationalised and scheduled banks. Thus at present there are 116 banking institutions to meet the credit needs of the people of the district. The distribution of these banks according to development blocks is given below :-

Development Block	Number of Banks			Total
	Cooperative	Rural	Other	
1	2	3	4	5
1. Charama	1	2	1	4
2. Kanker	2	-	2	4
3. Sarona	-	2	1	3

	1	2	3	4	5
4.	Bhanupratappur	2	2	1	5
5.	Durgkondal	-	1	1	2
6.	Keshkal	1	2	1	4
7.	Makdi	-	1	-	1
8.	Kondagaon	2	2	1	5
9.	Pharasaon	-	2	1	3
10.	Baderajpur	-	1	-	1
11.	Narayanpur	2	2	1	5
12.	Orchha	-	1	-	1
13.	Koilibeda	-	3	2	5
14.	Antagarh	1	-	1	2
15.	Bakawand	1	1	1	3
16.	Jagdapur	2	6	8	16
17.	Bastar	1	2	2	5
18.	Darbha	-	1	1	2
19.	Bastanar	-	-	1	1
20.	Tokapal	-	1	1	2
21.	Lohandiguda	1	1	2	4
22.	Geedan	-	2	2	4
23.	Dantewara	2	1	4	7
24.	Bhairangarh	-	2	1	3
25.	Bijapur	2	1	1	4
26.	Bhopalpatnam	1	1	1	3
27.	Kuakonda	-	1	1	2
28.	Katikalyan	-	1	-	1
29.	Chhindgarh	-	1	1	2
30.	Sukma	1	1	1	3
31.	Usoor	-	3	1	4
32.	Konta	1	3	1	5
<b>Total :</b>		<b>23</b>	<b>50</b>	<b>43</b>	<b>116</b>

The branches of Central Cooperative Bank are almost evenly distributed in North, Central and Southern parts of the district but other banking

# MADHYA PRADESH DISTRICT BASTAR BANKS AND POST OFFICES



**DISTRICT BASTAR  
BANKS (BLOCKWISE) 1983-84**

1 STATE BANK OF INDIA — (51)

2 CENTRAL BANK OF INDIA — (23)

3 BANK OF BARODA — (3)

4 CANARA BANK — (1)

5 UNITED COMMERCIAL BANK — (2)

6 DENA BANK — (2)

7 BASTAR REGIONAL RURAL BANK — (1)

8 BASTAR CO-OPERATIVE BANK — (1)

9 PUNJAB NATIONAL BANK — (1)

10 UNION BANK OF INDIA — (1)

**TOTAL BANKS 116**

**POST AND TELEGRAPH OFFICES (TEHSILWISE)**

1 HEAD POST OFFICE

2 PUBLIC CALL OFFICE

3 SUB POST OFFICE

4 TELEGRAPH OFFICE

5 BRANCH POST OFFICE

**STATE BOUNDARY** ———

**DISTT.** ———

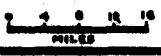
**TEHSIL** ———

**DEV. BLOCK** ———

**DISTRICT H.Q.** □

**TEHSIL H.Q.** ○

**DEV. BLOCK H.Q.** ●





institutions show a tendency of concentration more in the centre. Over all distribution also indicates a slightly higher concentration in the central parts, owing probably to Jagdalpur which is also a district headquarter and has the highest number of existing banking institutions. This may also be for the reason that trade and commerce is more pronounced in and around urban centres than other rural and semi urban places. Three centres i.e. Jagdalpur, Dantewara and Kanker have more other banking institutions. Bastar, Lohandiguda in Jagdalpur tehsil, Koilibeda in Narayanpur tehsil and Geedam in Dantewara tehsil are other places where other banking institutions are operating. While branches of Cooperative Bank and Rural Bank may be opened at places under general development strategy 'other banking institutions being profit oriented institutions generally come up where business matches the comparative costs. Assuming it to be the case in Bastar it can be inferred that seven places mentioned above are upcoming centres for trade and commerce. The Central Cooperative Bank functioning through LAMPS, service societies and farmers service societies serve people in areas where other banking institutions have not penetrated. The cooperative Bank in 1981-82 had Rs. 409.88 lakh as working capital. The deposits in the Bank increased from Rs. 116.27 lakh in 1977-78 to Rs. 294.31 lakh in 1981-82. During the same year the Bank advanced Rs. 714.16 lakh. However, the recovery position of loans was not altogether satisfactory since outstanding loans in 1981-82 were of the order of Rs. 242.95 lakh although there was slight improvement from the position obtaining in 1980-81, The factors like disbursement of salaries of managers of LAMPS from the cadre funds, non-recovery of loans, some of them being fictitious loans, commitment to increasingly provide short term credit facilities, provision of necessary finances for providing consumption loans to small tribal farmers etc. are to a great extent responsible for none too happy financial position of the Cooperative Bank. Financial aid, therefore, is necessary to support the activities of the Bank.

Land Development Bank the institution for providing long term agricultural financing, is expected to provide 50 per cent of the total long term agricultural credit made available in the district. The Bank

was operating in 1981-82 on a working capital of Rs. 82.15 lakh. The advances during the same year amounted to Rs. 79.85 lakh and outstanding loans were to the tune of Rs.69.80 lakh. The recovery position of loans was not satisfactory as the amount of outstanding loans has shown a continuous increase from 1977-78 upto 1981-82. The Reserve Bank of India has directed with a view to disciplining the function of the Bank that only those Banks which have attained a 75 per cent level of recovery of loans would be eligible for share capital assistance. The recovery of outstanding loans in this context has to be stepped up and improved to make the Bank capable of taking up massive programme of lending for agricultural development.

The realisation regarding economic exploitation of tribals by money lenders and traders led to the creation of non-exploitative credit cum marketing structure. Acting on the recommendations of Bawa committee Largesized Agricultural Multi Purpose Cooperative societies were organised at some development block and important hat centres. These co-operative societies are commonly called LAMPS and are engaged in the supply of agricultural credit, consumption loan, collection and sale of agricultural and minor forest produce and distribution of essential commodities. For purposes of the collection of agricultural and minor forest produce LAMPS function as agents of MARKFED and MPFDC . Presently 96 LAMPS, 14 at development block level including two Farmers Service Societies functioning as LAMPS and 82 at hat level are functioning in the district. There are 7 branches of LAMPS located at Kurandi in Jagdalpur, Sonarpal in Bastar, Madded in Bhopalpatanam, Kerlapal in Sukma, Tongapal in Chhindgarh, Chhindnar in Geedam and Mokpal in Katikalyan development blocks. The distribution of these societies within the area of different development blocks is as below :

Charama	4	Jagdalpur	4
Kanker	6	Darbha	3
Sarona	4	Bastanar	2
Bhanupratappur	3	Tokapal	3
Durgkondal	3	Lohandiguda	3
Keshkal	5	Geedam	1
Makdi	5	Dantewara	1

Kondagaon	7	Bhairamgarh	1
Pharasaon	3	Bijapur	1
Baderajpur	3	Bhopalpatnam	1
Narayanpur	3	Kuakonda	1
Orchha	1	Katikalyan	1
Koilibeda	3	Chhindgarh	1
Antagarh	3	Sukma	1
Bakawand	8	Useor	1
Bastar	7	Konta	1

These LAMPS being located at block and hat level are utilised by various departments and agencies such as Forest, Agriculture, Tribal, Cooperative departments and MARKFED to carry out their commitments. As such control and coordination of activities have become lax and there is need of an independent intermediate agency to look after these aspects and to train the personnel working in the LAMPS to adequately perform multidimensional functions. Nevertheless, LAMPS during 1981-82 handled the advance of short term loan of Rs. 66.98 lakh, medium term loan of Rs. 4.27 lakh and long term loan of Rs. 70.86 lakh. They also handled consumption loan of Rs. 3.50 lakh. During the same year they purchased agricultural produce to the tune of Rs. 14.02 lakh and forest produce worth Rs. 597.00 lakh. In addition retail sale of consumer goods was carried out to the extent of Rs. 80.09 lakh. Looking to the average area of more than 400 sq. km. and average size of more than 19000 population which each of these LAMPS presently cover the quantum of business handled by these societies with only a skeleton staff can be considered satisfactory but it certainly spells out the need for opening more branches with a view to intensifying their efforts and to provide an organisational setup for properly supervising and coordinating their activities.

The marketing activities are carried out by the Apex Marketing Federation through its branches and 8 Marketing societies functioning in the district. These Marketing societies also function as agents of the Apex Marketing Federation and undertake sale, purchase and processing activities. The Marketing societies are located at tehsil level and three out of them are also engaged in running rice mills and a oil mill.

LAMPS being multipurpose cooperative societies are also engaged in marketing activities and in fact they handle most of the marketing activities in cooperative sector at lower levels.

Apart from these credit and marketing activities, carried out by cooperative societies, there are other activities also which have come under the cooperative sector. There are 22 Industrial cooperative societies with a membership of 941 and which are engaged in the business of brick making, handicrafts, brass and iron metal artifacts, wood work, tailoring, oil extraction, cocoon rearing etc. There are 17 Weavers Societies with a membership of 596 engaged in cloth making of Khadi and handloom variety. Fish rearing production and sale of fish is handled through 9 fisheries cooperative societies. There are also 3 milk supply cooperative societies, 2 poultry cooperative societies, 11 housing societies, and 5 labour societies working in the district. In addition 15 primary stores, 2 wholesale stores, 7 employees credit societies, 2 rickshaw pullers societies and 5 other non agriculture credit societies. These latter categories are mostly urban societies.

Storage capacity has also been created in the cooperative sector. LAMPS own 97 godowns with a storage capacity of 1250 MT and marketing societies have 17 godowns of a total storage capacity of 6200 MT. The total storage capacity thus comes to 7450 MT. which needs to be augmented with a view to compete effectively with other traders. The limited storage capacity inhibits large purchases by the societies at the time of harvest or forest produce season with the result that small producers take shelter of the local Kochia for disposing of their produce.

## **2. Approach and Strategy**

The brief analysis of the existing situation in the cooperative sector brings forth the inescapable conclusion that activities for raising crop productivity and reorganising produce market has to be extended to cover greater area and population. The present norm of about 40 sq.km. of area and 10,000 population to be covered by a large sized agricultural multipurpose society does not fit into the picture. The district being sparsely populated have a poor population area ratio and to cover 10,000

population the society shall have to increase its area to about 217 sq. km. The coverage of such a big area in a tribal district will hardly be manageable by a single society. If the present norm of about 40 sq.km. is retained then the population size shall have to be reduced to about 2000 persons which is about the size the density of population in the district suggests. A smaller, population per society will also have an added advantage in the socio-cultural context i.e. the membership of the society will ordinarily be from the same community and the members will combine in a better manner under the leadership of their community leader. It will be easier to persuade them to adopt better technologies for raising crop production once their leader is convinced and adopts them himself. The cultural trait of personalised service to the community will further strengthen the cooperative structure for production and urge them to achieve higher goals. The question of leadership is at the core of any cooperative venture. It would, therefore, be in the interest of people as well as cooperative societies to open more branches of existing LAMPS so as to cover effectively more people and to organise them in more cohesive social groups.

It is also apparent that in the initial stages cooperative development can only be achieved with the active support of government. Acute shortage of finance, lack of trained personnel, inadequate facilities for the training and education of members and office bearers and pending the emergence of strong federated cooperative structures government support is necessary to ensure proper administrative supervision and management of cooperative societies. In the development strategy government too regards cooperation as an instrument for the implementation of its economic programmes particularly in the fields of agriculture and marketing. This strategic weightage heaps further responsibilities on the government. However, governmental support should not be made incumbent permanently and there should be noticeable effort on the part of the government to make itself superfluous as quickly as possible. Long and active participation of government in the management of cooperative societies becomes counterproductive for it precludes the possibilities of the emergence of a suitable leadership and increases the dependence of cooperative societies on government. It should be

emphasised that the role and function of cooperative societies should not be conceived to have been completed with the disbursement of loans to and recovery from its members. Between these two points in time cooperative societies have a bigger and important role to play i.e. they have to see that other concomitant inputs have been made available to the members and that they have used them properly. The function of providing and recovery of loan with interest is common to both the money lender and the cooperative society but the vital difference is in the responsibility attached to the cooperative society to see that the loan has in fact increased agricultural productivity and thereby the income of the member. This is the only way to ensure the continued existence of the society and participation in the implementation of economic programme of the government. This part of the function can only be achieved if the members of the society genuinely form a cooperative collective. The burden of this function necessitates the participation of cooperative institutions in extension activities, educating the cultivator and promoting savings and investments. In the present context cooperative societies should organise their activities in coordination with agriculture, plant protection, and irrigation extension functionaries with a view to creating a concinnous arrangement for matching the demand and supply of essential agricultural inputs. The responsibility of the government through its development functionaries is to bring awareness regarding the availability and use of various growth promoting inputs and it is the primary responsibility of cooperative societies to make them available to their members. Apart from moral responsibility there is economic reason for cooperatives to do it since this function is related to distribution of income by reducing costs and profit margins of other go-between agencies. Here again the question of right leadership arises which the existing cooperative development set up is hardly attuned to create. Cooperative societies should, for the present, share the onerous responsibility of governmental agencies in distributing seeds, fertilizers, pesticides, tools, plants and other associated inputs before embarking upon their independent procurement and distribution ventures.

Reorganisation of produce markets is another area where cooperative societies can effectively function and help increase the incomes of

their members. The term marketing includes activities relating to (a) purchase from the producer and sale to intermediate or final consumer, (b) processing of the produce including drying milling or preserving, (c) grading, packing etc. (d) storing and transporting, and (e) developing capabilities to deal in by-products. The guiding aim of cooperative marketing is to manage the purchase and sale of produce in a manner that brings increased income to the member with or without technical change. The reorganisation of produce markets will face two problems viz., (i) smaller producers will have smaller quantities to be purchased by the societies and (ii) the influence of the local trader. It will mean that the societies shall have to maintain a certain level of liquid finances at all times with them and that at appropriate levels they will have to provide the above mentioned five services. In addition, they will have to have a contract by which all members shall have to deliver their disposable produce to the societies. In the initial stages cooperative marketing societies' main function would be to pay their members full market value of their produce and other service costs shall have to be met from out of the government help. There are certain fundamental criteria both economic and social which will determine the success of cooperative marketing societies. Managerial skill is the most critical of all factors. The manager both in his capacity as a person and as a leader will influence the course of working of the society. The loyalty of members is another important factor. Financial stability is again a critical factor and the cooperative societies cannot change the existing marketing system without having adequate working capital to cover cash purchases, advances, storage costs etc. To sustain these costs the volume of business shall have to be adequately large and the rural people must have to be genuinely convinced that the existing market system does not function in their best interest. This will require high degree of extension services and a full financial and administrative support from the government. In a tribal area the psychology of the people and their selling and purchasing habits shall have to be considered. The people being poor can hardly perform their economic activities on a cash basis. They generally mortgage their future produce with the local trader for meeting their needs of the present. Cooperative societies, therefore,

shall have to arrange for the advance of money for carrying out their productive functions and in addition loans on nominal or with no interest will also have to be given to the people to save them from the exploitative clutches of the trader. The need of an efficient manager for the society must again be emphasised even at the cost of repetition. A system of training shall have to be evolved to develop managerial skill in the local youth since importing capable managers from outside will not be sustainable for small cooperative societies. As pointed out earlier single large cooperative society will not be supportable in the peculiar spatial circumstances of the district. Small branches of LAMPS will have to be opened at lower levels, particularly at hat centres wherefrom purchased produce may be transported to the headquarter of the main society. It may also be useful to purchase significant quantum of produce from the farms of cultivators by organising purchase depot in bigger villages during the harvesting season.

Organisation of consumer cooperatives in rural areas is a difficult task owing mainly to low demand profile for general consumer items except the necessities. However, it is one of the most vital issues in cooperative development. With a view to provide articles of general necessity such as salt, kerosene, sugar etc. branches of LAMPS may be utilised. Efforts may also be made to take advantage of financial assistance available under NCDC sponsored schemes to establish industrial units for producing consumer goods based on agricultural produce particularly keeping in view the demand in urban areas.

### 3. Plan Proposals

Cooperative development as an instrument to alleviate poverty and backwardness of the tribal people of the district and to ensure economic advancement with social justice has been widely accepted. With a view to bring tribal population within the fold of cooperative activities in the field of agricultural production, it is envisaged that the cooperative societies shall have to protect the tribals from local money lender by providing loans for his consumption use and provide agricultural inputs so as to encourage them to adopt modern agricultural practices capable of increasing farm output. These



societies will also have to provide remunerating market for the produce of the tribal and create new avenues for employment in the marketing, processing and storage activities. Increase in agricultural productivity will need basic technological change for which cooperative societies will have to arrange adequate and quick facilities for both short and long term credit with a view to improving land and purchase of necessary inputs. For attaining these objectives the activities of cooperative societies will have to be further decentralised and their organisational set up strengthened. Within this perspective the following programme for cooperative development is proposed to be taken up during the Seventh Five Year Plan.

#### **Cooperative Marketing, Processing and Storage**

The present cooperative set up is inadequate and ineffective in properly organising and supervising activities relating to marketing, processing and storage. These activities are being carried out through 96 LAMPS and 8 marketing cooperative societies. The LAMPS suffer from many shortcomings due to lack of proper supervision and adequate coordination of their multifarious activities. They are responsible to MARKFED for the collection of minor forest produce, to Central Cooperative Bank for credit supply and recovery and to different government departments for carrying out their programmes. This multiplicity of control by and answerability of LAMPS to different agencies has led to a situation of loose control and ineffective coordination since there is no central agency to coordinate work allocation of different agencies to the LAMPS and to supervise and help them in achieving their objectives. The personnel responsible for running these societies is not properly trained. It is also not possible for any of the existing institutions to exercise overall control over LAMPS. In such a situation and to overcome all these shortcomings it is contemplated to set up an independent body which may function as a coordinating organisation for the LAMPS and other marketing societies and also cater to their needs of noncredit finances such as advances to purchase minor forest and agricultural produce. The proposed body would be an independent Divisional level marketing organisation for Bastar Division and is proposed to be named as "The Bastar Divisional

Tribal Development Cooperative Union Ltd." It will be an autonomous and independent body which will keep liaison between government agencies and the cooperative marketing societies, deal in procurement of forest and agricultural produce through LAMPS and arrange their sale. The body will have direct linkages with the District Central Cooperative Bank for co-ordinating credit activities, with MARKFED for marketing of agricultural and forest produce; with cooperative processing units for getting agricultural and forest produce processed and with other government departments for coordinating the work of input supply and subsidies. The aims and objects of this society will be as follows :

- (a) to promote the socio-economic development of tribals and to save them from economic exploitation.
- (b) to have complete administrative and financial control over the co-operative societies.
- (c) to strengthen the financial resources of the co-operative societies.
- (d) to help provide agricultural credit, inputs and consumer loans etc.
- (e) to purchase forest and agricultural produce and other commodities from the members through primary agencies.
- (f) to arrange for the distribution of essential commodities and consumer articles at reasonable price to the members.
- (g) to establish and manage processing units.
- (h) to own and construct godowns for the storage of agricultural and forest produce, agricultural inputs and consumer articles etc.
- (i) to arrange for the transportation of commodities.
- (j) to arrange the training for the staff of co-operative societies.
- (k) to ensure gradual replacement of managers and functionaries by local persons in cooperative societies.
- (l) to conduct any other business to achieve above objectives for the

socio-economic development of tribals.

### Membership

The society will be a registered body and all the LAMPS and Primary Marketing Societies working in the area will be its ordinary members. The government will also be a member of the society. The Apex Marketing Federation, Central Co-operative Bank, Forest Development Corporation etc. will be its nominal members. The Commissioner of the Division will be its ex-officio Chairman and Divisional head of Co-operation department in Bastar Division will be ex-officio Vice Chairman. The Managing Director of the society will be taken from cooperation department who will be of the rank of a Deputy Registrar.

### Functions

It is proposed that the society should be authorised to act as the sole purchaser on behalf of government and its various federations/corporations. In any event the society is expected to handle all business of purchasing forest produce and agricultural produce of its members. Since the society will pay rates fixed by the government or the market rates for the produce, it is expected that non-members would also sell their produce to the society. The purchases would be affected through LAMPS and other marketing societies.

It is estimated that the society will handle forest produce viz.; Tendu leaves, Sal seed, Harra, Mahua flower, Mahua seed, Tamarind, Mango, Phulbuhari, Honey, etc. worth Rs. 18.00 crore. Agricultural produce such as Paddy, Mustard, Ramtil, Maize, Pulses, etc. is expected to provide a business of about Rs. 5 to 6 crore. Further, sale of kerosene, a prime necessity for the tribals, is expected to generate a business of about Rs. 1.00 crore and for maintaining its regular supply it is proposed to set up three Kerosene pump houses at Narayanpur, Sukma and Bijapur. Salt is another basic necessity of the tribal people and its subsidised supply is likely to provide a business of Rs. 0.40 crore.

The society has also to take up the supply of essential commodities such as wheat, rice etc. to the people for the major part of

the year. It is estimated that handling the supply of these essential articles of consumption will create a business of about Rs. 1.60 crore.

The supply of agricultural inputs such as seed, fertilizer, sprayers, insecticides, etc. will further increase business activity by about Rs. 1.25 crore and other retail business by about Rs. 0.45 crore.

The total quantum of business, thus, likely to be handled by the society would be of the order of Rs. 28.00 crore in a year. This would involve the requirement of augmented storage capacity and it is proposed to construct 35 godowns of 1000 MT capacity each during the Seventh Five Year Plan since it is estimated that 75 tonnes of minor forest and agricultural produce and 3 lakh standard bags of tendu leaves will have to be godowned. Financial assistance to the extent of 50 per cent of the cost can also be availed of under NCDC scheme.

It is also envisaged to take up value adding activities with the increase in business of the society with a view to increase incomes of the members. In addition to the existing processing units at Jagdalpur, Kondagaon and Kanker it is proposed to establish 10 processing units viz; 5 rice mills, 2 Dal mills and 3 Oil mills in the cooperative sector. The feasibility of opening these processing units have already been established by the Lohani committee.

#### **Shares, Capital and Subsidies**

The authorised share capital of the society is proposed to be Rs. 20.00 crore. Financial position of LAMPS and PMS which are to be its members is weak and they are not in a position to purchase shares of BDTDCU from their funds. Initially, therefore, the government shall be required to provide loans to these societies for purchasing required number of shares of BDTDCU. The government shall also purchase substantial number of shares. The total share money from the government required thus is Rs. 3.00 crore for its own shares and Rs. 0.79 crore for LAMPS and PMS. Further, initial management and infrastructure cost subsidy will also be given by the government to let the society be organised properly and subsequently function effectively. Management cost subsidy is estimated at Rs. 1.07 crore during the Plan period. Further, financial

support from the government in the form of subsidy for subsidised sale and distribution of salt and in the form of margin money to maintain margins for borrowing money from other agencies is envisaged to the tune of Rs. 1.00 and Rs. 2.50 crore respectively. The society as envisaged in the programme will take up construction of godowns for which 50 per cent of the total cost will be available as loan and 50 per cent of the remaining cost as subsidy from NCDC. Thus, the share of the government would only be of 25 per cent of the total cost and on this account Rs. 0.24 lakh would be forthcoming from the government.

Thus the total financial requirement of the Bastar Divisional Tribal Development Cooperative Union would be about Rs. 8.77 crore during the Plan period.

Apart from these financial estimates for the Divisional Cooperative Society, managerial subsidy to Primary Marketing Societies, additional share capital to selected marketing societies as well as to all existing societies, subsidy for the repair of rural and marketing godowns, loans to complete the construction of incomplete rural and marketing godowns and subsidy for the construction of new rural and marketing godowns under NCDC scheme would also be required from the government. Further provision for establishing new cooperative processing units shall have to be made. Thus for all these activities a provision of Rs.0.44 is proposed in the Seventh Plan.

The total financial allocation needed for Cooperative Marketing, Processing and Storage programme would thus be Rs. 9.21 crore.

#### **Short and Medium Term Credit**

It is proposed to continue and implement the existing programme during the Seventh Plan period. However, further decentralisation of primary cooperative societies is felt necessary. Schemewise details are given below :

##### **(i) Managerial Subsidy to Existing LAMPS**

The loaning activities of LAMPS have not reached a point where they could meet their establishment costs but looking to the peculiar situation of the tribal district it is also essential to make them financially viable. The LAMPS are not able to defray salary expenses of their

working personnel. The managers are being paid by the District Central Co-operative Bank. It is therefore proposed that every LAMP be given Rs.10.00 thousand annually during the Plan period as managerial subsidy.

**(ii) Extension of Existing LAMPS**

For achieving the goal set before LAMPS for providing essential commodities to the tribals with minimum hardship and also for providing marketing facilities for their agricultural and forest produce, it will be necessary to create a net work of these societies, keeping in view the size and population of the district. At present 11 development block level and 85 hat level LAMPS are working in the district. With a view to cover as far as possible all important hat level places it is proposed to open 147 branches of existing LAMPS in addition to the 7 branches already in existence. The staff for each branch will consist of one manager and one assistant. As far as possible local people will be employed. Each branch will have to be provided Rs. 6000.00 per year towards the establishment cost for 5 years.

**(iii) Outright Grant for Special Bad Debt Reserve**

Economic development with income distributive effect weighted in favour of the poor necessitates provision of capital to weaker sections of the society. Assistance for maintaining reserve with the Bank as well as societies' contribution towards bad debt reserve is necessary. It is proposed that contribution to the extent of 4 per cent of the additional short term financing to the Bank and 12 per cent to the societies be provided. It works at the rate of Rs. 1000.00 for the first year and Rs. 1400.00 for the subsequent four years per annum per society to a total contribution of Rs. 6.34 lakh.

**(iv) Interest Subsidy to Weak Farmers**

Under the scheme of 'differential rate of interest' for providing interest subsidy to the tribal/harijan and other small farmers who are not covered under IRDP, and who hold irrigated land upto 5 acres or 10 acres unirrigated land are to be given interest subsidy. An amount of Rs. 24.56 lakh will have to be provided during the Plan period for adjusting interest beyond 4 per cent. These estimates are based on the quantum of advances

made available by Cooperative Bank to economically weak farmers belonging to scheduled caste, scheduled tribe and other communities.

**(v) Risk fund on Consumption Loan**

Consumption loan is provided to weaker section of farmers having holding of land upto 0.5 acres, village artisans and landless labourers by the Bank and Cooperative Societies for meeting expenses on medical, education, marriage, birth, funeral ceremonies etc. An outright grant to the Cooperative Bank and Primary Societies to the extent of 10 per cent of the consumption loan advanced has to be given towards Risk Fund. A provision of Rs. 0.96 lakh is proposed for the Plan period for this purpose.

**(vi) Writing-off of fictitious loans**

In the process of advancing loans, some fictitious advances also take place which come to light at a later stage. The weak co-operative structure cannot withstand the loss on account of writing-off of such advances. The provision of Rs. 2.88 lakh has been made for the Plan period to meet out such losses.

**(vii) Investment in the Share Capital of LAMPS**

LAMPS undertake credit business, purchase of agricultural and forest produce and distribution of essential commodities. With a view to improve the economic viability and borrowing powers of LAMPS it is necessary to contribute towards share capital of these societies. A provision of Rs. 620.00 lakh is proposed for this purpose during the Plan period.

**(viii) Loan assistance to Central Cooperative Bank for non overdue cover**

Under the advice of Planning Commission, the Cooperative Central Bank has to increase short term loaning at a rate of 15 per cent per annum to achieve a level the country has already reached. The bank with its weak financial structure cannot be expected to achieve this objective. The internal resource position of the Bank is not that sound that it could meet the credit demands to maintain non overdue cover. In such a situation loan assistance would necessarily be required. It is estimated that assistance to the extent of Rs. 75.00 lakh would be needed to make the Bank capable to meet credit needs of the people.

**(ix) Investment in Share Capital of the Central Cooperative Bank**

The District Cooperative Central Bank, being in tribal area, is facing a situation of heavy overdues which has affected its operational capacity adversely. It is proposed to provide an amount of Rs. 50.00 lakh for the Plan period to the Bank out of long term operations fund so that it could increase its agriculture loaning programme.

**(x) Social Consumption Loan to Small Tribal Farmers**

The consumption loans are provided to tribals for protecting them from exploitation of private money lenders. Under this scheme a tribal is provided an interest free loan of Rs. 250.00. A provision of Rs. 24.00 lakh for Plan period is made for this purpose.

**(xi) Subsidy to Tribals for Purchase of Shares of LAMPS**

It is proposed to increase the tribal membership of LAMPS by 20 members per society per year. Since tribals are not in a position to purchase shares themselves a provision of Rs. 4.80 lakh for the Plan period is proposed to be made for membership subsidy.

**Long Term Credit****(i) Investment in Share Capital of District Land Development Bank**

The District Land Development Bank is engaged in long term financing for agricultural development. The loan recovery position in the district is not satisfactory although attempts are being made for its improvement. The Bank is functioning in a tribal area and loan recovery position in this context is not surprising. With a view to taking up a massive land development programme either the norm has to be changed or resource position has to be augmented. However, in expectation of improved recovery position it is proposed to make provision of Rs. 2.50 lakh during the Plan period for augmenting the resources of the Bank.



**(ii) Opening of branches of District Land Development Bank**

Land Development Bank at present is having 7 branches in the district. Three more branches at Geedam, Sarona and Chhindgarh will be opened by the end of Sixth Plan. The Bank with its existing branches is not in a position to serve all the 32 development blocks of the district. Since increasing agricultural productivity is a priority objective a large and comprehensive programme of land development will have to be taken up within a short time. It is therefore proposed to open 10 more branches of Land Development Bank at Jagdalpur, Bastar, Lohandiguda, Darbha, Bhanupratappur, Antagarh, Pharasgaon, Keshkal, and Bakawand development blocks.

**(iii) Loan for Purchase of Share of Land Development Bank by the Members of ST/SC**

Because of their poor financial condition, the tribals are not in a position to purchase share of Land Development Bank and consequently they do not become eligible to take advantage of loaning facilities offered by the Bank. It is proposed that the members of Scheduled Caste be given interest free loan of Rs. 500.00 per member or 5 per cent of the loan whichever is less so that they may purchase shares of Land Development Bank. An amount of Rs. 5.00 lakh is proposed for this purpose for the Plan period.

**(iv) Share Capital Contribution to Land Development Bank to raise its lending eligibility**

The Land Development Bank of the district has been identified as a weak Bank by the Reserve Bank of India because of low rate of recovery of loans advanced. Consequently, the Land Development Bank becomes ineligible for unrestricted lending. It is proposed that share capital contribution to the extent of Rs. 10.00 lakh be made by the government so that the recovery position may improve notionally and thereby making it eligible for lending in higher slabs. Accordingly a provision for this purpose is proposed in the Seventh Plan. The contribution for the first year of the Plan will be Rs. 4.00 lakh and Rs. 1.50 lakh annually for the subsequent years.

**(v) Interest subsidy to the Member holding land upto 10 acres**

The government have decided that Adivasi and Harijan farmers holding land upto 10 acres are eligible for differential interest subsidy. The scheme is in operation and it is proposed to continue it during the Seventh Plan. Accordingly, a sum of Rs. 2.00 lakh has been proposed under this scheme to provide differential interest subsidy to its eligible members according to the demand on the basis of recovery from these Adivasi and Harijan members. The amount is to be apportioned prorata among 32 development blocks during the first year of the Seventh Plan.

**(vi) Rehabilitation Assistance to Land Development Bank**

During the past few years the recovery of Land Development Bank has shown deterioration. The out standing old debts have therefore to be aggregated as per RBI advice and only 20 per cent of them are to be included every year. For this purpose the LDB should have to create a bad debt reserve at their level, out of profits to the extent of recovery. The situation in these circumstances does not appear encouraging as the Bank is not likely to create adequate reserve. Therefore, it is proposed that a provision of Rs.3.00 lakh for the Plan period may be made as rehabilitation assistance to L.D.B.

**(vii) Appointment of Supervisors**

For effective and efficient supervision of preparation of loan cases, servicing of existing accounts, records and verification of investments the provision of one supervisor for 100 loan cases is considered essential. In view of the expectation of increase in lending operations during the Seventh Plan it is proposed to appoint 25 supervisors during the Plan period for which a sum of Rs. 2.28 lakh is proposed to be given to the Bank as subsidy.

**Consumer Cooperatives****(i) Strengthening of Primary Consumer Stores**

Presently consumer articles are being distributed in the district through 2 wholesale Consumer Co-operative Stores, 8 Marketing

Societies, 96 LAMPS and their branches. The financial condition of the Primary Co-operative Stores is not very sound and needs to be strengthened. Under this scheme a provision of Rs. 1.25 lakh is proposed to strengthen 5 Co-operative Stores located at Kondagaon, Kanker, Jagdalpur and Bachel.

**(ii) Establishment of Consumer Industry under NCDC Sponsored Scheme**

Under this scheme 2 bakery units, one at Jagdalpur and the other at Kondagaon under District Wholesale Consumer's Cooperative Stores, are proposed to be set up. This scheme will involve an expenditure of Rs. 2.00 lakh. A provision of Rs. 0.52 lakh being the State's share at the rate of 26 per cent under the NCDC scheme is being proposed in the Plan.

**(iii) Establishment of Kerosene Pump Houses**

Regular supplies of Kerosene oil to the interior centres become difficult during the rainy season. To overcome this situation, three Kerosene Pump Houses each with a 30000 litre capacity at Narayanpur, Bijapur and Sukma are proposed to be set up. A provision of Rs.1.50 lakh for this purpose is being proposed in the Plan.

**(iv) Labour Cooperative**

It is proposed to organise 7 Labour Construction Cooperative Societies in Narayanpur, Dantewara, Sukma, Kirandul and Koilibeda. Each society will be given assistance of Rs.0.18 lakh towards share capital, managerial subsidy and equipment subsidy. A provision of Rs. 1.26 lakh have been proposed under this scheme.

**Transport Cooperatives**

The district possesses poor transport net work. A good transport system is essential to help LAMPS and Primary Marketing Societies engaged in the purchase and transportation of forest and agricultural produce. It is proposed to organise 8 transport societies at Jagdalpur, Bijapur, Konta, Dantewara, Kondagaon, Kanker, Narayanpur and Bhanupratapur, during the Plan period with a view to save on recurring costs on hired transport. Each society will have one bus and one truck and

will be given Rs. 2.00 lakh for the purchase of vehicles and the balance will be met by a loan from the bank. Each society will be given establishment subsidy to the extent of 50 per cent of establishment costs which would be about Rs. 7.68 lakh. Thus, a provision of Rs. 23.68 lakh has been made for the Plan period. It is hoped that BDTDCU will also use these services and these societies will have enough business for the trucks to keep them busy throughout the year.

### **Co-operative Education and Training**

#### **(i) Training Centre**

LAMPS are primary level societies and are engaged in the supply of agricultural credit, consumption loan, collection and sale of agricultural and minor forest produce and distribution of essential commodities.

Proper training to the staff of these societies will greatly help in making the functioning of these societies effective. It is proposed to establish a training centre at Jagdalpur to impart training to the staff engaged in primary and middle level management. A total of 150 persons will be trained in a year in ten batches of 15 persons each. It is expected that the centre will need financial help for the Seventh Plan period only and later on 'BDTDCU' will be capable of running the centre out of its own profits. A provision of Rs. 19.50 lakh has been proposed for the Plan period to cover establishment charges, building and fixtures, vehicle and training expenditure.

#### **(ii) Management subsidy to District Cooperative Union**

The district cooperative union is not directly engaged in any trading or commercial activity. Its main business is the supply of agricultural credit, consumption loan, collection and sale of agricultural and minor forest produce and distribution of essential commodities. Keeping in view its meagre resources the government gives management subsidy to this Union. It is proposed to continue to give subsidy. Accordingly a provision of Rs.0.20 lakh for the Seventh Plan period.

### **Direction and Administration**

The role assigned to the Co-operative movement in the district at the primary level is to arrange for agricultural credit, consumption

loan, collection and sale of agricultural and minor forest produce and distribution of essential commodities with a view to increasing the incomes of members of cooperative societies. The activities of these primary societies put together become enormous and widely spread out which have to be coordinated with the State level programmes at different stages and that of many other departments. For effective supervision and efficient implementation of the programmes, it is necessary to provide an adequate departmental machinery. Accordingly the following posts are proposed to be created during the Seventh Plan period.

Category of Staff	Existing No.	Proposed (No.)
1	2	2
<b>A. Administrative</b>		
1. Additional Registrar	-	1
2. Joint Registrar	1	-
3. Deputy Registrar	2	8
4. Asstt. Registrar	7	27
5. Audit Officer	2	1
6. Senior Cooperative Inspector	5	5
	<u>17</u>	<u>42</u>
<b>B. Ministerial/Establishment</b>		
7. Office Supdt. (J.R. Office)	-	1
8. Steno (Add./Joint Registrar)	-	1
9. Steno typist (Dy. RCS)	-	8
10. Head Assistant (J.R. Office)	-	1
11. Head Clerk	2	-
12. U.D.C.	5	-
13. L.D.C.	9	-
14. Peon	18	-
	<u>34</u>	<u>11</u>
<b>C. Field Staff</b>		
15. Cooperative Inspector	10	-
16. Cooperative Extension Officer	18	14
17. Sub-Auditor	29	-
	<u>57</u>	<u>14</u>

For meeting the establishment expenditure, a provision of Rs. 57.24 lakh including Rs. 9.00 lakh for vehicles is being proposed.

The total cost for Cooperative Development proposed for being taken up during the Seventh Five Year Plan would be Rs. 19.56 crore, the schemewise break up of which is given below :

Scheme	Proposed outlay (Rs. in lakh)
1	2
1. Cooperative Marketing Processing and Storage	920.88
2. Short and Medium Term Credit	902.74
3. Long Term Credit	27.28
4. Consumer Cooperatives	3.27
5. Labour Cooperatives	1.26
6. Transport Cooperatives	23.68
7. Cooperative Education & Training	19.70
8. Direction and Administration	57.54
Total :	<u>1956.35</u> or <u>19.56 crore</u>

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## ROADS

Locomotion has always been a prime factor in economic development. For better and speedier mobility of man and material, development of road surface has played a significant role. In the context of growing economic interrelationship between areas, a good road communication system has become sine qua non of development of the area. Bastar district fares poorly in respect of communications and most of its areas are cut off virtually from any contact with even neighbouring areas. The district has an area of 39114 sq.km. with only 1973 km. length of pucca roads.

The only rail link between Jagdalpur and Vizagapatnam is essentially meant for iron ore traffic. The density of pucca roads comes to about 5.05 km. per 100 sq. km. of area as against 11.9 km. for the State. The district is the biggest among 45 districts of the State in terms of area but is poorest in terms of road density. No wonder, it is backward since neither new technologies nor new ideas can spread in the district in the absence of roads and proper communication system. Out of the total 3388 inhabited villages only 481 villages have been connected by roads upto 1982-83 which comes to about 14 per cent.

Road development should be with emphasis on the linkages to be established between growth centres, markets and administrative centres. The vertical and horizontal linkages assume importance in this context. The former links higher order centres with the lower order places while horizontal linkages are between the same order centres. Jagdalpur, the headquarter of Bastar district is vertically linked with all the 8 tehsils, 28 out of 32 development blocks and 25 out of 27 police stations. This lack of road links even with administrative centres indicates under development and reflects the presence of barriers to policy implementation at the lower levels. The lack of horizontal spread of road communication is also evident by the remoteness of villages from metalled roads which is shown in the following table :

Percentage of villages according to the distance from metalled road				
Distance	less than 1 km.	1 to 2 km.	3 to 5 km.	6 km. & above
Percentage of villages	7.0	6.0	14.0	73.0

It may be observed that poor road length in the district appears to have affected the spatial dispersal of social facilities. Some of the social inputs considered to be basic for strengthening the fabric of rural development are still not available to most of the villages and for which tardy communication system, specially road links are considered to be the cause. The Economic Census conducted in 1977 revealed that more than 27 per cent of villages did not have any primary school within three kilometers, about 80 per cent villages did not have the facility of any medical dispensary within 6 km. and 85 per cent of villages were located at more than 6 km. from any primary health centre.

The district is predominantly inhabited by tribals and in a tribal economy hat centres (weekly markets) play important role both in economic and social contexts. They are the centres where a tribal comes into contact and interacts with people of other communities, learns useful new techniques, experiences cultural minglings, sells, purchases and performs many social commitments apart from enjoying the outing. These hat centres are the future growth centres and from here technological aspects of development can be taken up by the tribals much more easily. There are about 290 hat centres in the district. Since tribal people make it a point to attend these hat centres regularly every week there exists a linkage with the centre through some sort of road or track but these hat centres are not conveniently linked with higher order centres with the result that these have demonstrated only conventional exchanges of goods, services and ideas. These places can be transformed into real nerve centres of growth if they are properly linked vertically with higher order places and horizontally with hinterland settlements. Presently, 108 hat centres are linked with pucca roads and most of them have recently developed these links accidentally on account of administrative



necessities. Tehsilwise position is shown in the table below :

Tehsil	Number of hat centres	Number of hat centres connected by road
1	2	3
1. Kanker	65	18
2. Bhanupratappur	22	11
3. Narayanpur	28	16
4. Kondagaon	56	12
5. Jagdalpur	66	24
6. Dantewara	15	8
7. Bijapur	18	10
8. Konta	20	9
	290	108

It would appear that about 37 per cent of weekly markets have developed links with pucca roads, but these links are more incidental than by design. They are located either on major district roads or subsidiary district roads. A large number of hat centres are still out of the way from the point of view of development functionary. Also from the villagers point of view they are so located that they can only track the distance. The mode of transport therefore remains rudimentary and slow. There is need to construct roads joining bigger villages with some main road and, as far as possible, all hat centres. Without such a network of roads it would be very difficult to equip the growth centres with necessary services and replenish them with necessary stock of inputs. The demand for inputs can only effectively be matched if their supply to the service centres is ensured.

The district is rich in mineral resources. Bailadilla in Dantewara tehsil is already producing the best iron ore. Deposits of various minerals have been located in the northern, western, eastern and south western sub regions of the district. Important of these minerals are bauxite, asbestos, mica, limestone, dolomite, marble, felspar, graphite, corundum, copper, lead and iron ore. The finding of these minerals makes the district potentially rich provided these resources are worked and the produce is transported to refining and

processing centres and finally to the markets. Without such a facility the district will remain, as it is now, poor amidst plenty.

The district is the biggest in the State in terms of size with a poor density of population of 47 persons per sq.km. There are areas in the district which have a density of about 4 persons per sq. km. The settlements are scattered all over the space in the form of tiny villages and hamlets with the result that inter village distances are significantly more as compared to the State. It has been estimated that intervillage mean distance in the district is about 40 per cent more than the inter-village mean distance for the State. This fact coupled with the tribal characteristics of the population, woeful lack of road linkages and undulating terrain underlines the difficulties of administration and implementation of development policies in the area. Any policy aiming at providing administrative, developmental and socio political infrastructure to the people shall have to be framed in the light of above analysis and, of necessity, will have to bear with a higher cost of development. The norms of development else where found relevant can not be made applicable to Bastar as for example road links with villages of a population of 1000 and above will bring only nominal development in the area and a vast majority of people would be left out of its ambit.

The tribal subplan to be implemented during the course of the Sixth Five Year Plan accepted hat centres as the nucleus for tribal development and envisaged a programme of road construction which will link the hat centres with the main road. However, the priority was given to link tehsil headquarters in tribal areas with all weather roads and hat centres were accorded second priority. Road development has shown a very slow growth over the last quarter of a century. The total length of pucca roads existing before the beginning of the five year plan era in the district was about 524 km. or 1.4 km. per 100 sq.km. of area. During the period beginning from 1956-57 upto 1982-83 about 1449 km. of road length was added bringing the level to 1973 km. or 5.05 km. per 100 sq.km. On an average 54 km. of road was completed and added every year. However, during the Sixth Five Year Plan the tempo of road development has increased and it averages about 109 km.

per year for the first three years of the Plan. The likely achievement during the last two years of the Plan is expected to conform to the existing level of yearly addition to the road mileage. The following is the distribution of existing road length among various development blocks of the district.

Sub region	Development Block	Existing roads (km.)
1	2	3
Northern	Charama	87.3
	Sarona	57.7
	Kanker	66.6
	Bhanupratappur	89.9
	Durg Kondal	68.4
		<u>369.9</u>
North Western	Antagarh	37.0
	Koilibeda	48.2
		<u>85.2</u>
Western	Narayanpur	12 6.6
	Orchha	38.6
		<u>165.2</u>
Central	Keshkal	43.2
	Pharasgaon	39.4
	Makdi	15.0
	Kondagaon	154.6
	Baderajpur	1.8
	Bastar	61.0
	Jagdarpur	127.4
	Bakawand	55.0
	Lohandiguda	80.6
	Tokapal	33.8
	Darbha	40.0
	Bastanar	48.6
		<u>700.4</u>

1	2	3
South Western	Geedam	68.9
	Kuakonda	35.3
	Dantewara	77.6
	Bhairamgarh	39.0
	Bijapur	36.0
	Bhopalpatnam	<u>47.8</u> <u>304.6</u>
South Eastern	Katikalyan	9.8
	Chhindgarh	54.2
	Sukma	<u>68.5</u> <u>132.5</u>
Southern	Usoor	66.6
	Konta	<u>148.8</u> <u>215.4</u> <u>1973.2</u>

The above demarcated sub regions of the district have different topographical characteristics. The northern sub region is flat country with occasional rises. North western parts are also flat lands but possessing slightly more undulating surfaces and projections of hilly terrain from neighbouring areas. Western sub region includes area highly criss-crossed with hills and most difficult terrain in the district. The central parts of the district form the bulk of the plateau. South western, southern and south eastern sub regions are mostly plain country with occasional high mountainous areas having plain valleys of considerable magnitude. The terrain necessitates different types of road surfaces to be constructed according to the need of the area and profitability of the construction programmes. It is evident from the above data that distribution of road kilometrage among development blocks is not even. The development blocks which are near or above the State average number 4 and are shown below :

Sub region	Development Block	Road length per 100 sq.km.
1	2	3
North	1. Charama	10.4
West	2. Narayanpur	10.6
Centre	3. Jagdalpur	12.2
South	4. Konta	12.5

Of the four blocks listed above three are tehsil headquarters and the fourth too has become a tehsil now. The good road length in these areas is on account of administrative necessities. Three of them are connected by the main road running from Jagdalpur to Raipur and this road length is sufficient to give the average that they have. Narayanpur is again linked with Kondagaon and its length within the boundaries of Narayanpur block is substantially large. However, roads vertical to the main road are few and these are the roads which matter in making the area more approachable.

The next group of development blocks belong to the category of having a road mileage equal to or more than the district average. They constitute about 34 per cent of the total development blocks and on an average they possess roughly half the length of the State average. They are :

Sub region	Development Blocks	Road length per 100 sq.km.
1	2	3
North	1. Kanker	7.5
	2. Bhanupratappur	7.9
	3. Durgkondal	5.7
Central	4. Kondagaon	6.7
	5. Bakawand	5.3
	6. Lohandiguda	8.2
	7. Tokapal	5.0
	8. Bastanar	6.2
South West	9. Geedam	7.2
	10. Dantewara	7.7
South East	11. Sukma	6.9

Out of these 11 development blocks 4 are tehsil headquarters. The major road length is again for administrative convenience which almost makes up the whole of the existing kilometrage. The off shoots connecting the interior villages are lacking.

The third category of development blocks is below the district average. This category includes 17 development blocks which constitute about 53 per cent of the total blocks in the district. They are listed below alongwith index of available road length in each of them.

Region	Block	Per 100 Sq.Kms. (Kms. )
North	1. Sarona	4.7
North West	2. Antagarh	3.5
	3. Koilibeda	2.6
West	4. Orchha	3.3
Central	5. Keshkal	3.2
	6. Pharasgaon	3.5
	7. Makdi	2.1
	8. Baderajpur	0.2
	9. Bastar	3.9
South West	10. Darbha	4.7
	11. Kuakonda	3.6
	12. Bhairamgarh	2.5
	13. Bijapur	2.0
South East	14. Bhopalpatnam	2.2
	15. Katikalyan	1.2
	16. Chhindgarh	2.9
South	17. Usoor	3.1

This category includes three tehsils. The road availability index for these development blocks is very low and is mostly on account of roads connecting block headquarters. Most of the places listed in the central sub region are situated on trunk route.

The road situation, however, looks somewhat assuring if it is viewed from the standpoint of villages connected by roads. The district comprises 3388 inhabited villages out of which 310 are such villages which have a population of 1000 persons or more, 634 villages fall in the category of having a population between 500 and 999 persons and 2444 villages are small and have a population of less than 500 persons. The following table gives the position of villages which have already been connected by roads.

Population groups	No. of villages	Number connected by road	Percentage to total villages in the group
1	2	3	4
Less than 500	2444	222	9.1
500 - 999	634	124	19.6
1000 and above	310	135	43.5
	3388	481	14.2

## 2. Approach and Strategy

The implementation of Minimum Need Programme in the district is primarily responsible for connecting bigger villages by roads. Looking to the size of the district and characteristically wide dispersal of smaller villages and their hamlets on space it does not appear feasible to connect all of them with roads within the period of a single Five Year Plan howsoever intensely one may desire. The main constraint would be the financial resource and more importantly the immediate lack of return on investment as the traffic will not be large and construction of roads, by any standard, will not be profitable. However, road construction to smaller villages from the point of view of carrying social inputs like health, education, drinking water etc. and opening outlets for their meagre produce to outside markets will have to be considered. On the other hand merely connecting bigger villages having population of 1000 persons and more would also not meet the requirements. The idea is to make available communication facilities to large number of people and since villages having population of 1000 or more constitute

only 9 per cent of the total villages and their spread among the blocks uneven their linking with roads will only serve limited objective. In these circumstances it would be proper to alter the norms as laid down by the government to accommodate the inclusion of villages falling within the population range of 500 or more. With the inclusion of these medium sized villages the percentage coverage of villages would go up to 28 per cent of the total villages and the population likely to be covered would be more than one third of the total population.

Given this situation of overall poor road mileage, absence of road links to administrative units and development worthy focal points, a general priority has to be assigned to road construction programme according to the area of need and the type of roads to be constructed. A special treatment has to be accorded to Abujhmar area of the district which is a difficult area both in terms of geophysical terrain and social environment of simple hill marias who ought to be exposed to modern civilization with utmost care. The objectives of road construction in the district, therefore, should be stated clearly and set realistically. The overall objective of a road construction programme during the next five or ten years should be to take up roads with a view to make administration more effective, connect areas and villages wherefrom augmented production of any kind is expected to flow towards markets, open up areas for implanting growth agents and to bring greater degree of interaction between the villages and higher order centres through a net work of road links between the villages and weekly market centres. Accordingly priority may be assigned to :

- (1) complete the construction of ongoing road works speedily: no new road works be taken up until incomplete works in the area are completed;
- (2) connect all existing but unconnected development blocks headquarters, police stations and areas which need road linkages for maintaining order and administrative control;
- (3) connect all villages having a population of 500 or more with internal priority of first linking all villages having



V.L.W., Patwari and LAMP headquarters, medical and health institutions, training centres, and locations of important minerals;

- (4) connect all hat (weekly market) centres with villages within the service area of each of them and with the market and major district road.
- (5) roads of inter district and inter-state importance.

The basic idea of ordering these priorities in the above manner is to render road communication facilities first within the district with minimum direct outside linkages with a view to gradually acclimatising adivasis to outside influences. In Abujhmar area road construction programme is proposed to cover the peripheral areas in the initial stages and then gradually branching out to cover interior areas and villages. The road network is proposed in such a manner that all villages are able to reach on metalled road within a radius of 7 Kms. Road construction in forest areas should be suitably integrated with the general road construction programme in the district and should be so adjusted as to provide linkages from the main roads to the villages situated in the deeper points within the forest. However, ingress and exit controls may be applied by the forest department.

Another priority to be determined relates to the choice of formation status of roads in terms of geometric and structural characteristics. The layout and other geometric characteristics of road are determined in relation to present level of transport needs and also making some allowance to the needs likely to arise in the next ten years keeping in view the administrative set up, investment patterns and development activities in the area. These characteristics have a direct bearing on the costs of the programme. Traffic forecasts, for any area, over a long period tend to become inaccurate and hence a ten year perspective will meet the requirements of a road development plan. The traffic requirements over the period for a tribal area cannot be of a high magnitude. However, multiple road linkage is an essential development component both as a catalytic agent in the beginning and subsequently as a firm base for supporting the increasing load of traffic to and from the area of its location. The choice therefore is not so much between the places to be connected

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by roads as it is between different types of roads. The need to connect as many villages by road as possible cannot be diluted but it can be decided with quite some precision as to what type of road should be provided to different regions according to their capacity of generating traffic. The district being a tribal district it will not be advisable to subject all proposals of road development to a vigorous cost benefit analysis with a view to taking up only such projects which show profit. The district is abound with natural wealth and any road construction programme in relation to their full exploitation will show a high degree of profit. However, it has since been decided to give high weightage to the development of skills in the people and to provide them impetus within their sociocultural frame to exploit and utilise the natural advantage the area offers to them and also to restore simultaneously the renewable resources, it is proposed to optimise the use of scarce financial resources for maximizing the creation of road infrastructure without excessive dependence upon profitability criteria in the short run. This strategy necessitates a discriminatory approach in determining the quality of roads to be constructed in the area. In view of the above approach following guidelines have been adopted for determining the quality of roads;

- (a) all tehsil headquarters, development block headquarters, police stations and all areas and villages needed to be opened up for improving the administration and maintaining order should be connected with all weather black topped metalled roads;
- (b) all villages having a population of 500 and above should be connected with improved morrum surfaced roads having all bridges and culverts duly constructed. However, in places where black cotton soil or high gradients occur patches of roads should be constructed with specifications of a bitumen surfaced carriageway.
- (c) all hat centres and villages within their service area should be connected with unimproved roads i.e., a simple jeepable track free of vegetation and retaining natural contour lines suitably aligned for future development with

semi permanent structures for culverts and causeways.

Road Construction Programme, apart from utilising considerable financial resources also requires clearing of jungle and at this point it runs counter to the objectives of forest development. A better coordination between the forest and public works departments with regard to the formulation and implementation of road development plan is absolutely necessary. It is felt that a road plan formulated in consultation with the forest department will go a longway in eliminating delays in implementation, cost overruns and finalising a perspective plan which will entail lesser felling of forest and prove mutually beneficial. A highway master plan for a ten year perspective will show areas where it shall have to encroach on forests and mutual adjustments can be made while deciding final alignment of roads. However, it is further felt that a tentative alignment plan for connecting villages may be prepared by a joint survey team of both the departments and a programme of forest clearance may be taken up according to road priority plan prepared by the public works department one year in advance.

Implementation of road development plan calls for an integrated approach in matters of road construction. Different quality roads may be taken up simultaneously in different areas arranged in order of need based priority assigned to each of them. The priority will be determined according to the principles laid down earlier and accordingly the quality of roads would be decided as per guidelines already formulated. The emphasis should be on low cost roads which may be improved in terms of quality with the increase in traffic. However, roads should be effectively and carefully maintained and if need be the village roads may be transferred for maintenance to the Rural Development Department. In designing low cost roads emphasis should be on the use of locally available material. In the case of unimproved roads surfacing materials can be the soils found on the line of the road. Plasticity characteristics of soils differ and their use in different climatic zones requires a different plasticity index. However, almost any soil would serve the purpose in forming road surfaces of unimproved roads provided that the road and its environs are kept dry as far as possible. Wide range of naturally occurring

materials, such as lateritic and quartz gravels, partially decomposed rock etc., can be used as base material in improved roads with the condition that the material selected should have uniform and constant quality and sufficient strength to withstand the traffic. The design of the road should be guided by the present load of traffic and its subsequent estimated increases. It should not be solely determined by the conventional layout or strength. Another point to be emphasised is the drainage. Preference should be given to retaining the natural drainage pattern for speedy clearance of rain water while surface drainage be established by suitable cross fall for removing surface run off and also to ensure that any water which may percolate to the lower layers is also removed speedily. Dwarf sized vegetation can also be grown over the face of the cutting or slope to protect it from the effects of splash erosion. Finally, low cost roads should not sacrifice safety considerations and therefore care should be taken to provide adequate sight distances on all crests, establish better correlation between vertical and horizontal alignment, avoid long straights to reduce monotonous, provide maximum road width with proper elevation and widening at bends for counteracting centrifugal force and fix road markings, directions and warning signs. Keeping these considerations in view the following standards and specifications are proposed for road construction.

1. Roads of administrative importance will consist of two lanes to be used by traffic moving in opposite directions. Existing roads are to be improved according to standard specifications of bitumen surfaced roads. The total road width is to be increased wherever traffic considerations warrant.
2. New road works to be taken up for connecting villages with the main roads will be designed and constructed as per village road standards. The details regarding land width and pavement crust are shown below :

Land Width

1. Right of way,	25 meters
2. Formation	7 meters
3. Carriageway	3 meters

Pavement Crust

	B.C. Soil (mm)	Ordinary soil (mm)	Morrum soil (mm)
1. Morrums sub base	150	100	-
2. Oversize metal	150	150	150
3. 40 mm metal	100	100	100

These specifications will slightly change in case of Abujhmar area where formation width would be kept at 6 meters, carriageway width 3 meters and morrum sub-base thickness 100 mm. The formation width of medium bridges will be single lane i.e., 4.25 meters at all places in the district except Abujhmar area where it will be 2.5 meters. Major bridges wherever possible will be substituted by low vent causeways or flush causeways. The roads connecting hat centres with hinterland villages will be simple clearings of land width which may be kept at 20 meters with a view to obviate the necessity of acquiring and even finding additional land for future development since in not a distant future these roads will assume the status of feeder roads. It will be advisable to raise semipermanent structures for crossing nallahs and small streams for making these roads traffic worthy throughout the year.

The existing length of various types of roads in the district including black topped, water bound macadam, morrum surfaced and class III kachha roads is 3448 kilometers. Their categorywise distribution is as under :

Category	(In km.)				Total
	Surfaced		Unsurfaced		
	Black topped	Waterbound macadam	Morrumsurfaced	Kachha	
1	2	3	4	5	6
National Highway	212	-	-	-	212
State Highway	467	43	26	8	544
Major District Roads	300	211	65	80	656
Other Distt. Roads	148	592	666	630	2036
All Roads :	1127	846	757	718	3448

There is only one national highway passing through the district (NH 43) which joins Raipur in Madhya Pradesh with Waltair in Andhra Pradesh. It passes through Charama, Kanker, Kondagaon and Jagdalpur in the district and running for about 15 km. beyond Jagdalpur over the eastern boundary of the district it enters Orissa to go on its course to Waltair. The total length of this road in the district is 212 km. There are three State Highways (SH 9, 32 and 36) which serve the district and form about 26 per cent of the total length under surfaced roads. State Highway No.9 enters the district near Bhanupratappur from Rajnandgaon and runs literally vertical through the middle of the district. It passes through Bhanupratappur, Narayanpur, Palli, Barsoor, Geedam, Kirandul, Jagargunda, Golapalli and Mariaguram. However, this road is not complete. The portion between Palli and Barsoor is under construction and the portion between Kirandul and Mariaguram at the southern border of the district is yet to be constructed. State Highway No.32 coming from Raipur runs through northern part of the district horizontally and passes through Sihawa (Sarona Block) Brigudi, Dudhawa, Kanker, Bhanupratappur and Silpat (Bhanupratappur block) and goes on to reach Rajnandgaon. The third State Highway (SH 36) commences from Jagdalpur and runs along the centre of the district towards west passing through Geedam, Bijapur and Bhopalpatnam. It would appear from the above that out of a total of 1973 km. 722 kilometers of pucca road, or about 37 per cent of the total surfaced roads, exists under national and State highways. The total under NDR and ODR is 1251 km. of about 3.2 km. per 100 sq.kms.

### 3. Plan Proposals

The situational analysis brings out the fact that not only the district is poor in respect of road kilometerage but also in its distribution among different regions and development blocks. This situation also warrants a massive road construction programme to be taken up in the district with the objective of achieving State average for the district and district average for various development blocks combinidly and, if possible, individually. It may, however, not be necessary to achieve

an equitable distribution of road infrastructure among development blocks because of different levels of their needs. Any formula based equitable distribution of roads among development blocks will positively meet the approval of people but it may result in gross underutilisation of the infrastructure in some areas and create avoidable paucity of the facility in other areas where effective demand is higher. The proper dispersal of roads in different areas would best be achieved by prioritizing need based areas. In low priority areas unimproved roads may be provided which will serve the limited purpose of equity and accessibility to market centres. The priority to be assigned to different areas of the district may be based on the present availability of infrastructure, relative position with regard to the existing development potentiality, degree of consumption of growth inducing inputs and of course, population. However, general priority according to the availability of road infrastructure may be determined as of now and inter priority may be determined according to changing conditions as reflected through periodical reviews. The position of road length as it is likely to emerge on the completion of ongoing road works is given below :

S.No.	Development Block	Road mileage (in km.)			Availability per 100 sq.km.
		Existing	Under construction	Total	
1	2	3	4	5	6
1.	Charama	88.0	30.0	118.00	13.9
2.	Sarona	57.7	35.0	92.7	7.5
3.	Kanker	66.0	25.0	91.0	10.2
4.	Bhanupratappur	89.9	16.0	105.9	9.4
5.	Durgkondal	68.0	-	68.0	5.7
6.	Antagarh	37.0	7.0	44.0	4.2
7.	Koilibeda	48.0	42.0	90.0	4.8
8.	Orchha	38.0	23.0	61.0	5.2
9.	Narayanpur	127.6	26.0	153.6	12.8
10.	Keshkal	43.0	37.0	80.0	5.9
11.	Pharasgaon	39.0	25.0	64.0	5.7
12.	Makdi	15.0	67.0	82.0	11.6

1	2	3	4	5	6
13.	Kondagaon	154.6	69.0	223.6	9.8
14.	Baderajpur	1.8	50.0	51.8	6.9
15.	Bastar	61.0	88.0	149.0	9.8
16.	Jagdapur	127.0	32.0	159.0	14.9
17.	Bakawand	55.0	69.0	124.0	11.9
18.	Lohandiguda	80.0	46.0	126.0	12.9
19.	Tokapal	33.8	23.0	56.8	8.5
20.	Darbha	40.0	51.0	91.0	10.6
21.	Bastanar	48.6	24.0	72.6	9.3
22.	Kuakonda	35.0	20.0	55.0	5.7
23.	Geedam	69.9	7.0	76.9	8.0
24.	Dantewara	77.6	20.0	97.6	9.7
25.	Bhairamgarh	39.0	43.0	82.0	5.3
26.	Bijapur	36.0	35.0	71.0	4.0
27.	Katekalyan	9.8	54.0	63.8	8.0
28.	Bhopalpatnam	47.8	36.0	83.8	3.9
29.	Usoor	66.6	67.0	133.6	6.3
30.	Konta	148.8	63.0	211.8	17.9
31.	Sukma	68.5	25.0	93.5	9.6
32.	Chhindgarh	55.0	46.0	101.0	5.4
Total:		1973.0	1201.0	3174.0	8.1

The targetted infrastructure shown in column 4 above would be achieved when all the ongoing road construction works will be completed. It will be evident that inspite of this achievement fourteen development blocks would still be below the district average. Only two development blocks will be in the vicinity of State average which is likely to be about 15.8 by the end of Sixth Five Year Plan while at the end of March 1983 the number of such development blocks was four. However, the whole of this additional road length will not, in fact, be available by the end of the current plan since it is estimated that only about 296 km. of roads could be completed in the remaining period of the Sixth Five Year Plan. Thus, the total length available at the



end of Sixth Plan would be 2296 km. in the entire district with about 6 km. roads available per 100 sq. km. The balance of ongoing works shall have to be taken up during the Seventh Five Year Plan. This position with regard to the availability of roads would necessitate a higher target to be achieved with a view to providing adequate road length and its proper distribution.

The situation with regard to weekly market centres in relation to road links is also likely to be changed as a result of additional road mileage which is likely to be created. The position of road linkages with the weekly markets is likely to improve to the extent shown below :

S.No.	Development Block	Weekly Market Centres		
		Connected by road	Likely to be connected on completion of on-going works	Balance to be connected
1	2	3	4	5
1.	Jagdapur	3	2	1
2.	Bastar	5	4	3
3.	Lohandiguda	3	3	3
4.	Bakawand	3	5	12
5.	Darbha	3	1	4
6.	Bastanar	2	1	2
7.	Tokapal	5	-	3
8.	Kondagaon	4	5	8
9.	Pharasaon	3	2	5
10.	Keshkal	3	2	3
11.	Baderajpur	3	4	6
12.	Makdi	1	4	5
13.	Kanker	10	2	8
14.	Charama	3	3	17
15.	Sarona	5	1	16
16.	Bhanupratappur	9	-	5
17.	Durgkondal	2	-	6
18.	Narayanpur	7	-	3
19.	Antagarh	3	1	4
20.	Orchha	-	1	-

1	2	3	4	5
21.	Koilibeda	6	1	2
22.	Dantewara	3	-	1
23.	Geedam	3	-	-
24.	Kuakonda	2	2	-
25.	Katekalyan	-	1	3
26.	Konta	3	4	-
27.	Sukma	3	-	1
28.	Chhindgarh	3	3	3
29.	Bijapur	3	2	1
30.	Usoor	3	1	-
31.	Bhairamgarh	2	1	3
32.	Bhopalpatnam	2	-	-
Total :		110	56	126

On completion of ongoing works 7 development blocks out of 32 will have all the existing hat centres connected by road. The majority of these development blocks, however, belong to the southern sub region where the occurrence of weekly markets is less as compared to the central and northern subregions. Similarly, development blocks Orchha and Bastanar situated in the central and western sub-regions have one and three hat centres respectively. Out of the 126 hat centres left to be linked with roads 114 fall in the northern (54), central (53) and western (7) sub-regions. The northern and central sub-regions of the district have major concentrations of hat centres. These sub-regions are also relatively more exposed to outside economic influences and consequently more development prone. The need to connect maximum hat centres in these areas with a view to reach maximum number of people is obvious and urgent.

By the end of Sixth Five Year Plan the district will be having about 6 km. of roads per 100 sq. km. of area. The State during the same period is likely to achieve a level of 16 km. per 100 sq. km. of area. The existing distribution of road mileage among various development blocks in the district is not going to be changed substantially by the likely addition of roads as a result of the completion of some of the currently ongoing works. Presently, 12 development blocks are equal

or more than the district average. It is expected that additional road length of 296 km. may improve the situation in another 4 development blocks. This leaves 16 development blocks below the district average and as pointed out earlier that inspite of full completion of currently ongoing road construction programme 14 development blocks would still remain below the desired level. Apart from this basic necessity in different parts of the district some of the areas shall have to be given priority for a higher level of road length in view of administrative and developmental needs. Keeping this situation in view and to achieve the objective of bringing the district level with the State average a programme of road construction for about 4000 km. shall have to be taken up during the next few years. The balance of road construction programme presently in hand and likely to spill over to the Seventh Plan is estimated to be 905 km. and thus the likely target for new road works comes to about 3100 km. which has to be achieved with speed if the objective of catching up with the State average is to be fulfilled. However, according to the principles laid down earlier, spill over works have to be completed within the next one year before any programme of new roads can be taken up. It may also be emphasised that construction of only such roads should be taken up which are likely to be completed within the Plan period as it would be futile planning if incomplete road works are allowed to amass and huge financial and material resources are unnecessarily locked up and partially wasted.

The following programme within the frame work outlined above is proposed in three phases.

#### **Phase I**

The spill over road construction programme covering a road length of 905 km. should be taken up on a priority basis in all the development blocks of the district as time bound programme to be completed in 1985-86. In addition work may also be taken up to complete the missing link between Bailadilla-Mariyagudam a distance of 58 kilometers and the construction of bridges and culverts on Palli-Barsur section of State Highway No.9. The road assumes greater importance on account of Bhodhghat Hydel Project on Indrawati near Barsur.

**Phase II**

Preliminary work on roads of administrative importance should be started during the first phase with a view to taking up construction programme in phase two immediately. The roads identified as administratively important are :

1.	Golá palli	- Pamed Road	64 km.
2.	Pamed	- Usoor Road	44 km.
3.	Bhimaram	- Kolapalli Road	16 km.
4.	Sonpur	- Koilibeda Road	40 km.
5.	Basaguda	- Pinkodda Road	60 km.
6.	Golapalli	- Bheji Road	25 km.
7.	Usoor	- Maded Road	33 km.
			Total: <u>282 km.</u>

In addition, roads to connect four development blocks and two police stations should also be taken up during phase two. The programme of converting existing roads into black topped all weather roads covering about 388 km. should commence from phase two and should be completed by the end of Phase II. Road construction programme for bringing the remaining fourteen development blocks at par with the district average should also be taken up. These blocks alongwith proposed mileage are shown below :

S.No.	Development Block	Proposed road length (km.)	
		Black topped	Morrum surfaced
1	2	3	4
1.	Sarona	30.0	114.0
2.	Durgkondal	-	33.0
3.	Antagarh	30.0	10.0
4.	Koilibeda	-	142.0
5.	Orchha	80.0	134.0
6.	Keshkal	-	80.0
7.	Pharasmaon	-	79.0
8.	Baderajpur	-	100.0

1	2	3	4
9.	Kuakonda	-	64.5
10.	Bhairamgarh	-	110.0
11.	Bijapur	-	116.0
12.	Bhopalpatnam	50.0	23.0
13.	Usoor	35.0	120.0
14.	Chhindgarh	-	108.0
		<u>225.0</u>	<u>1233.5</u>

The programme for taking up construction of black top surfaced roads has already been included in this phase and the mileage of 225 shown above is included in that programme. Out of the remaining road length proposed only such work should be taken up which may be completed along with the road length of 282 km. already proposed to be completed within the targetted time. While selecting roads for being taken up for construction in the above blocks the priority within the block, would be to connect (a) villages having a population of 500 or above and (b) weekly market centres. Phase II construction programme should be completed by 1987-88. A system of proper monitoring may be developed with a view to maintain the pace of construction programme both from the point of view of time frame and financial management.

### Phase III

If construction programme envisaged above is carried out and targets achieved, a total of about 2500 km. of additional road length would be created in the district by the end of second phase of road construction. It will leave a balance of about 1500 km. to be achieved in the third phase. The balance of road length which would be left uncovered during the second phase will have to be taken up in the third phase and therefore the target for the third phase would be about 2000 km. This target does not appear to be achievable within the remaining period of Seventh Plan owing to the fact that demand for labour would have by then increased manifold due to implementation of other sectoral programmes. However, efforts should not be slackened and road construction programme

strictly according to priority should be continued. The programme for the remaining development blocks would be as follows :

S.No.	Development Blocks	Proposed Road length (km.)	
		Black topped	Morrum surfaced
1	2	3	4
1.	Charama	-	100.0
2.	Kanker	-	61.5
3.	Bhanupratappur	-	34.0
4.	Narayanpur	-	32.0
5.	Makdi	-	77.5
6.	Kondagaon	-	72.5
7.	Bastar	-	201.0
8.	Jagdapur	32	64.0
9.	Bakawand	10	80.0
10.	Lohandiguda	-	88.0
11.	Tokapal	-	75.0
12.	Darbha	-	67.0
13.	Bastanar	-	34.0
14.	Geedam	-	52.0
15.	Dantewara	-	43.0
16.	Katekalyan	-	74.0
17.	Konta	109	246.5 (-147)
18.	Sukma	<u>12</u>	<u>79.5</u>
		<u>163</u>	<u>1481.5</u>

The road length of 163 km. shown under black topped category is already included in the programme started in the second phase. Similarly about 147 km. of road length from Konta block have also been included in second phase programme. Therefore, in effect, the size of the programme would be about 1334 km. for the third phase. But it is also being estimated that about 533 km. of road will be left uncovered during the second phase and which shall spill over to the third phase. It is also expected that some of the roads proposed for being black topped will also be carried over. Taking into consideration this fall out from the second phase the target for the third phase is likely to

be enhanced and it is expected to be in the vicinity of 2000 km. of road construction. The likelihood of non achievement of a part of the target necessitates a slight change in the order of priority for taking up construction work. It is proposed to accord priority, as before, to deficient among these development blocks and if there has to be a short fall the roads in the development blocks of higher average road length may be dropped or may not be taken up in hand. The development blocks may be arranged in the following order for this purpose :

- |                   |                 |
|-------------------|-----------------|
| 1. Geedam         | 10. Kanker      |
| 2. Katekalyan     | 11. Darbha      |
| 3. Tokapal        | 12. Makdi       |
| 4. Bastanar       | 13. Bakawand    |
| 5. Bhanupratappur | 14. Narayanpur  |
| 6. Sukma          | 15. Lohandiguda |
| 7. Dantewara      | 16. Charama     |
| 8. Kondagaon      | 17. Jagdalpur   |
| 9. Bastar         | 18. Kanta       |

The construction programme envisaged will first be to complete run over works of about 533 km. and then to take up new works. The objective will be to complete the construction of all roads taken up in hand within the scheduled time frame and efforts should be to avoid leaving half completed works for being taken up in the next Plan period. The overall expectation at the end of Seventh Plan would be a net addition of 3525 km. of roads to the probable 2267 kilometers of road length which is likely to be achieved at the end of Sixth Plan. The total road length in the district, thus, would be 5792 kilometers with about 15 km. of roads per 100 sq. km. of area.

Road development in Abujmar area of the district requires cautious approach. The area is mountainous and inhabited by poor hill marias. They are almost completely cut off from any major outside influence. Although these people have not displayed any tendency to shun approaches to mitigate their pitiful and poor living conditions, they have also not shown any enthusiasm to invite any outside assistance. They need medical assistance, education, drinking water, cultivation

technology, clothes and essential consumer articles. The area without proper roads is virtually impregnable as most of the journeys can only be made on foot. However, since these people have lived in isolation for so long that they have come to accept this isolation and it cannot be ended with unilateral desire on the part of development functionary. Any attempt to open up the area suddenly will generate opportunities for outsiders to exploit them and create resistance in hill marias. They are few and are living in about 4000 sq. km. of land area with a density of about 4 persons per sq. km. Road construction programme in the area is a necessity since these people cannot be permitted to live in misery and poverty any longer but at the same time they should also not be exposed to alien influences with a degree of suddenness which they may not absorb and as a result become more helpless than what they are today. Keeping this aspect in view it is proposed to construct peripheral roads in the first phase which may only be traversed by jeeps or small transport vans. Therefore, a programme of constructing only four roads in the area is being contemplated which will commence from the boundaries of the area towards the centre but will not reach there. The advantage of such an approach is that village distances from surfaced roads will be reduced for most of the settlements to about 7 km. and the people will start using these roads for intraarea journeys. These roads will also help the administrator to reach the people and development functionary to work with them. The increased interaction at this level will generate confidence in the people of the area and will make them aware about the world around them. The stage is then set for the second and third phase of road construction programme. It is proposed to create 203 km. road length in Abujhmar area by the end of Seventh Plan.

### **Bridges**

The strategy regarding bridges and culverts for new proposed roads has already been laid down and as far as possible road communication would be established without taking recourse to the construction of major bridges. However, making the road trafficworthy throughout the year requires major bridges to be constructed. There were 10 major bridges under construction at the end of 1982-83 and they are not expected to be fully constructed by the end of Sixth Plan and shall have



have to be taken up during the Seventh Plan as residual spill over work. These bridges are located in Kanker, Jagdalpur, Dantewada, Sukma, Bijapur, Makdi and Bhanupratappur development blocks. Similarly 43 new major bridges shall have to be constructed on State Highways, major district roads and other district roads. These major bridges will be spread over 17 development blocks and in all directions in the district. These bridges are considered necessary to ensure interblock road communication throughout the year. Ten of these bridges will be on State Highways, 7 on major district roads and 26 on other district roads.

The massive road construction programme proposed for the district can not be properly implemented without providing technically competent supervisory and field staff. Similarly addition to plant and equipment is also necessary for making the department self reliant to a greater degree and eliminating dependence on private contractors and suppliers. The equipment such as diesel, road rollers, trucks, tractors, c.c. mixers, stone crushers, water tanker, trollies, crane, bearing machines, pumping sets power generating sets, survey equipments etc. have to be provided. The additionality in the present administrative set up would be of organising a new circle.

The total road development programme as proposed would cost about 107.47 crores, the details of which are given below :

	(Length)	Outlay (Rs. in lakh)
<b>A. <u>Construction of roads</u></b>		
(a) carry over roads	905 km.	16.43
(b) new proposed roads		
i. connecting villages having population of 500 and above	2311 km.	47.03
ii. in Abujhmar area	203 km.	4.06
iii. of administrative importance	282 km.	5.64
iv. connecting missing links and interstate roads	307 km.	9.81
	<u>4008 km.</u>	<u>82.97</u>

B.	<u>Construction of major bridges</u>		
	(a) carry over works	10 No.	1.19
	(b) new bridges	43 No.	12.01
		<u>53 No.</u>	<u>13.20</u>
C.	<u>Plant and equipment</u>	-	4.70
D.	<u>Additional Administrative set up</u>	-	6.60
		<u>-</u>	<u>11.30</u>
	Total :		107.47

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## INDUSTRY

### 1. General Review

Bastar is one of the most backward district of Madhya Pradesh in almost every sphere of economic activity. During 1982-83 the number of average daily workers was 1951 in 88 registered industrial units out of a working population of 9.42 lakh persons and this fact eloquently describes its industrial character. Taking into account the entire range of manufacturing, repairing and servicing units registered with the Industries Department of the State Government the total employment was 9706 persons in 2858 units scattered over the district which was about 1.03 per cent of the total working population. This State of poor industrial development of the district is in spite of vast natural resources which the district possesses. The area is endowed with rich forest of sal and teak and among prominent minerals found in the area are iron ore, bauxite, dolomite, corundum, tin, granite and lime stone. The hilly terrain of the area and abundant rains have created many ideal sites for generating hydel power. They however remain unutilised.

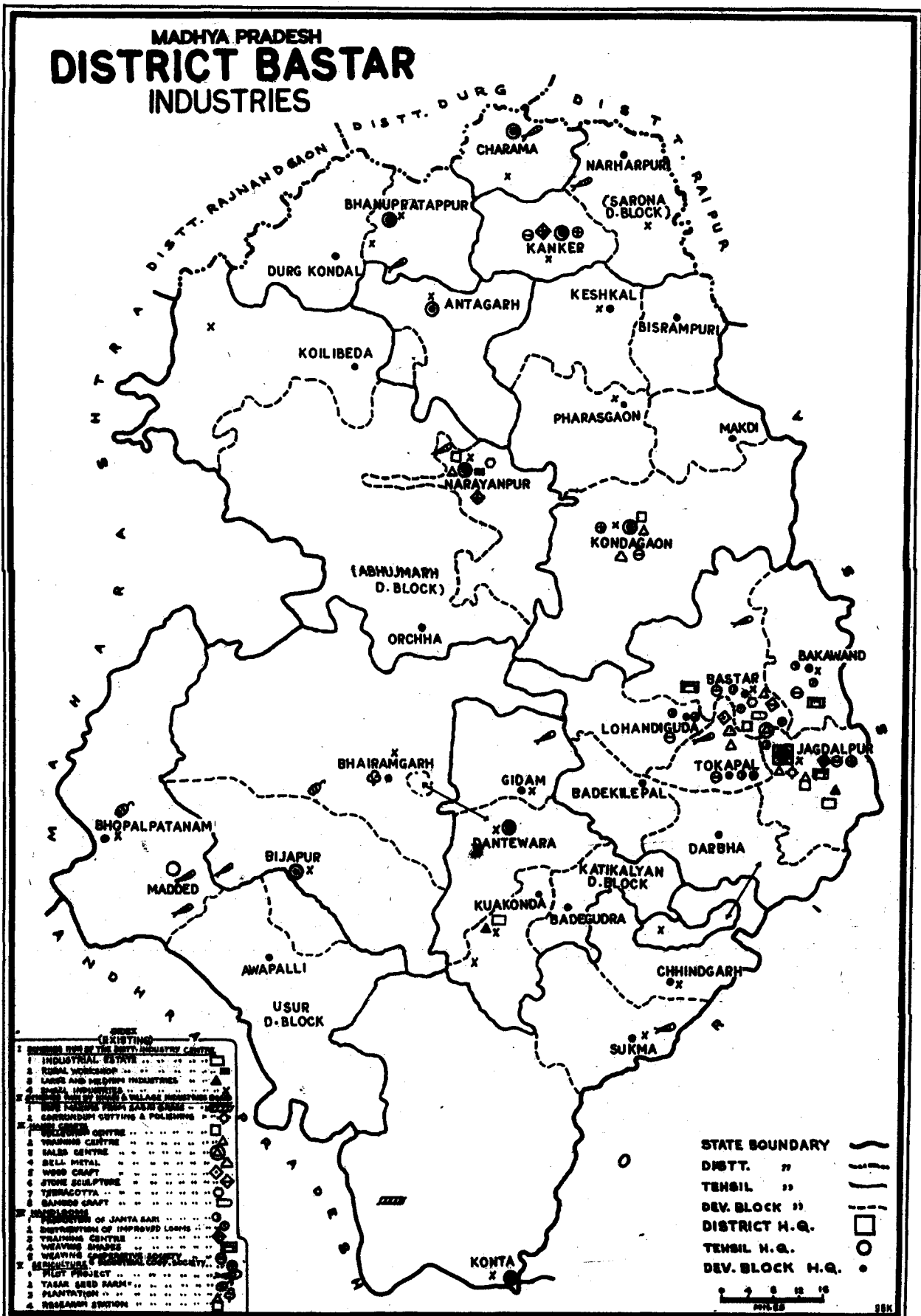
Natural barriers of dense forest and mountainous fastness kept the area cut off from the impact of modern civilization. Even today with a lot of changes having taken place, the district lacks utterly in road communications which is evident by a poor index of 5 km. of road length for every 100 sq.km. of area. The people of the district remained locked in isolated land pockets made impregnable by vast stretches of dense forest and high hills. Interaction among the few was the only possibility. This situation appears to be the main reason for poor industrial and non-industrial development. However, natural human creativeness did not desert them and they have developed skills and creative imagination which their primitive surroundings permitted them to possess. They are a people who have developed norms of life and behavioural attitudes out of sheer necessity of defending themselves from hunger and natural calamities. Their whole perspective is to grapple with the present without any thought for the future. Given this background their industrial skills are

limited to the creation of articles for their daily use such as wood, bamboo and stone work and their pursuits to cultivation, animal husbandry, poultry etc. The production is oriented towards self consumption and knows no wider horizons than the need of the clan or community

The approach for industrial development of Bastar, therefore, will be different. The industrial development in the State envisages a balanced distribution of industrial opportunities to various regions, creation of infrastructural facilities for the exploitation of available natural resources and providing incentives for attracting units to backward regions. With a view to fulfilling these objectives and considering the special circumstances of the district a District Industry Centre has been established in the district. Other agencies aiming at developing industrial atmosphere in conformity with the skills of the people and the need of the area are also functioning in the district. They are M.P. Khadi and Village Industries, M.P. Handicrafts Development Corporation and M.P.State Textile Corporation.

The District Industry Centre is headed by a General Manager assisted by five managers. It aims to quicken the process of industrialisation of the district, particularly of rural areas by providing guidance and assistance to entrepreneurs. Entrepreneurs are provided with full information regarding the viability of the industrial projects, availability of inputs and sources of financial assistance. In addition, assistance is also provided in project formulation, arranging bank loans and other subsidies from different sources. The entrepreneurs are given land on lease or industrial sheds in Industrial Estates on nominal rent. The centre grants concession subsidy for making available cheap power to small and medium scale industrial units. It also provides subsidies for capital, interest, transportation

# MADHYA PRADESH DISTRICT BASTAR INDUSTRIES



- LEGEND**
- (EXISTING)**
- 1 BUSINESS PLAN BY THE DISTT. SOCIETY CENTRE
  - 2 INDUSTRIAL ESTATE
  - 3 RURAL WORKSHOP
  - 4 LUMBS AND WOODWORK INDUSTRIES
  - 5 SMALL INDUSTRIES
  - 6 COOPERATIVE SOCIETY & VILLAGE INDUSTRIES GROUP
- (PLANNED)**
- 1 NEW PLANTATION FROM SARKI GROUP
  - 2 GROUNDWATER SINKING & POLISHING
- (UNDER CONSTRUCTION)**
- 1 TRAINING CENTRE
  - 2 SALES CENTRE
  - 3 BELL METAL
  - 4 WOOD CRAFT
  - 5 STONE SCULPTURE
  - 6 TERNACOTTA
  - 7 BANNED CRAFT
- (NEW PROJECTS)**
- 1 PROMOTION OF JANPA SARI
  - 2 DISTRIBUTION OF IMPROVED LOOMS
  - 3 TRAINING CENTRE
  - 4 WEAVING SHEDS
  - 5 WEAVING CO-OPERATIVE SOCIETY
- (RESEARCH)**
- 1 PLOT PROJECT
  - 2 TANK SEED FARM
  - 3 PLANTATION
  - 4 RESEARCH STATION

STATE BOUNDARY

DISTT. "

TENSIL "

DEV. BLOCK "

DISTRICT H.Q.

TENSIL H.Q.

DEV. BLOCK H.Q.

0 2 4 6 8 10  
MILES

of inputs and produce and rent. During the first three years of the Sixth Five Year Plan quantum of subsidy disbursement was as follows :

Type of subsidy	Amount Disbursed (In Rs.)		
	1980-81	1981-82	1982-83
1. Sales Tax Subsidy	9,371.14	17,159.52	56,189.10
2. Interest Subsidy	12,000.00	20,000.00	10,000.00
3. Capital Investment Subsidy	39,881.20	2,69,500.00	2,39,700.00
4. Electricity Subsidy	-	-	-
5. Subsidy under IRD Programme	69,065.00	5,38,115.61	23,328.00

The District Industries Centre provides loan for margin money to un-employed engineers and ensures easy availability of controlled items and other essential articles or raw material in short supply. Assistance is extended in marketing the produce of the entrepreneurs or it purchases itself under government purchases programme. SSI units are also helped by providing essential machines under hire purchase scheme.

The position of registered industrial units and employment provided by them over the last three years was as under :

Industries	Number of Factories			Average daily number of workers		
	1981	1982	1983	1981	1982	1983
1	2	3	4	5	6	7
1. Manufacturing of food products	13	14	15	193	393	396
2. Manufacturing of Wool, silk and synthetic textiles	1	1	1	260	260	260
3. Manufacturing of Wood and Wood Product, furniture & fixtures	57	57	62	773	773	779

	1	2	3	4	5	6	7
4. Manufacturing of non metallic mineral products		2	2	2	73	73	73
5. Manufacturing of metal products and parts except machinery and transport equipments		1	1	1	80	80	80
6. Manufacturing of machinery, machine tools and parts except electrical machinery.		2	2	2	130	130	130
7. Manufacturing of transport equipment and parts		1	1	1	12	12	12
8. Electricity		1	1	1	20	20	20
9. MPSRTC Workshop and sub depot		2	2	2	146	146	146
10. Industrial centre, DNK Project		1	1	1	55	55	55
Total :		81	82	88	1742	1942	1951

It will be observed that increase in the number of registered factories over three years is minimal and is concentrated in urban areas. The efforts of DIC have also not succeeded in creating an atmosphere for modern industrial development. Letters of intent have been issued for the establishment of industries in the fields of cement, plywood, pulp and paper projects, but these letters of intent may not be implemented for some time. The State Forest Development Corporation may take up the scheme of establishing a pulp and paper industry. However, one plywood manufacturing unit has come up in the medium sector and one Solvent Extraction Plant has also been established. These two units employ about 214 persons.

Nevertheless establishment of DIC has given a thrust to the development of industrial establishments in rural areas during the past few years by way of bringing new units and creating necessary infrastructure. The district had 456 small scale industrial units before the establishment of DIC. During 1979-80 to 1982-83 as many as 2402, SSI units have been established. These additional units mostly belong to rural artisans and have provided employment to more than 5150 persons.

The urban Industrial Estate at Jagdalpur has five sheds and 32 developed plots. They have been allotted to entrepreneurs. The units established in these sheds relate to oil crushing, manufacturing of match splint and veneer, bakery and general engineering works. The rural workshop at Narayanpur has two sheds and 10 developed plots.

The National Mineral Development Corporation is working at Bailadilla Iron Ore Mines and it is the only major mining project functioning in the district. The Bhilai Steel Plant has plans to exploit Raoghat deposits of iron ore in the near future. Similarly Corundum deposits have also not been exploited optimally, since jewellers, the main customer of the mineral are not yet decided since they depend upon skilled labour for this purpose and the labour has not shown any inclination to come to Bastar so far. Tin has been located in Bastar but it is scattered over a vast area. A pilot smelting plant is expected to come up at Bastar with the assistance of the Department of Atomic Energy for extracting rare minerals found as constituents of tin ore. Refractory grade bauxite has been found in Keshkal but the mineral is being investigated. A few units based on calcining of the ore have been set up.

### **Handicrafts**

Handicrafts are important heritage of tribal society. These represent the levels of their skill and imagination to create design patterns. These handicraft products are generally utility articles but some of them are genuine art pieces representing tribal culture and they attract connoisseurs of both Indian and foreign origin alike.



The main branches of these handicrafts are the following :

#### **Bell Metal**

Bell metal idols are made of old brass and wax and generally represent religious motifs. The craftsmen belong to Dhurva tribe who traditionally were engaged in manufacturing household utensils, idols and decorative pieces. There are 229 craftsmen scattered in the district. The raw material is available in the district. A cooperative society of these craftsmen was organised which looks after the marketing aspect of their products and endeavours to popularise them.

#### **Wood-craft**

Wood carving has been an age old craft of tribals. Scenes of wild life, hunting, dance and religious ceremonies are carved on the wood. Tribal life is vividly depicted in these scenes. These carvings are exported. These craftsmen number about 151 and are mostly located in Jagdalpur and Bastar development blocks.

#### **Sculpture**

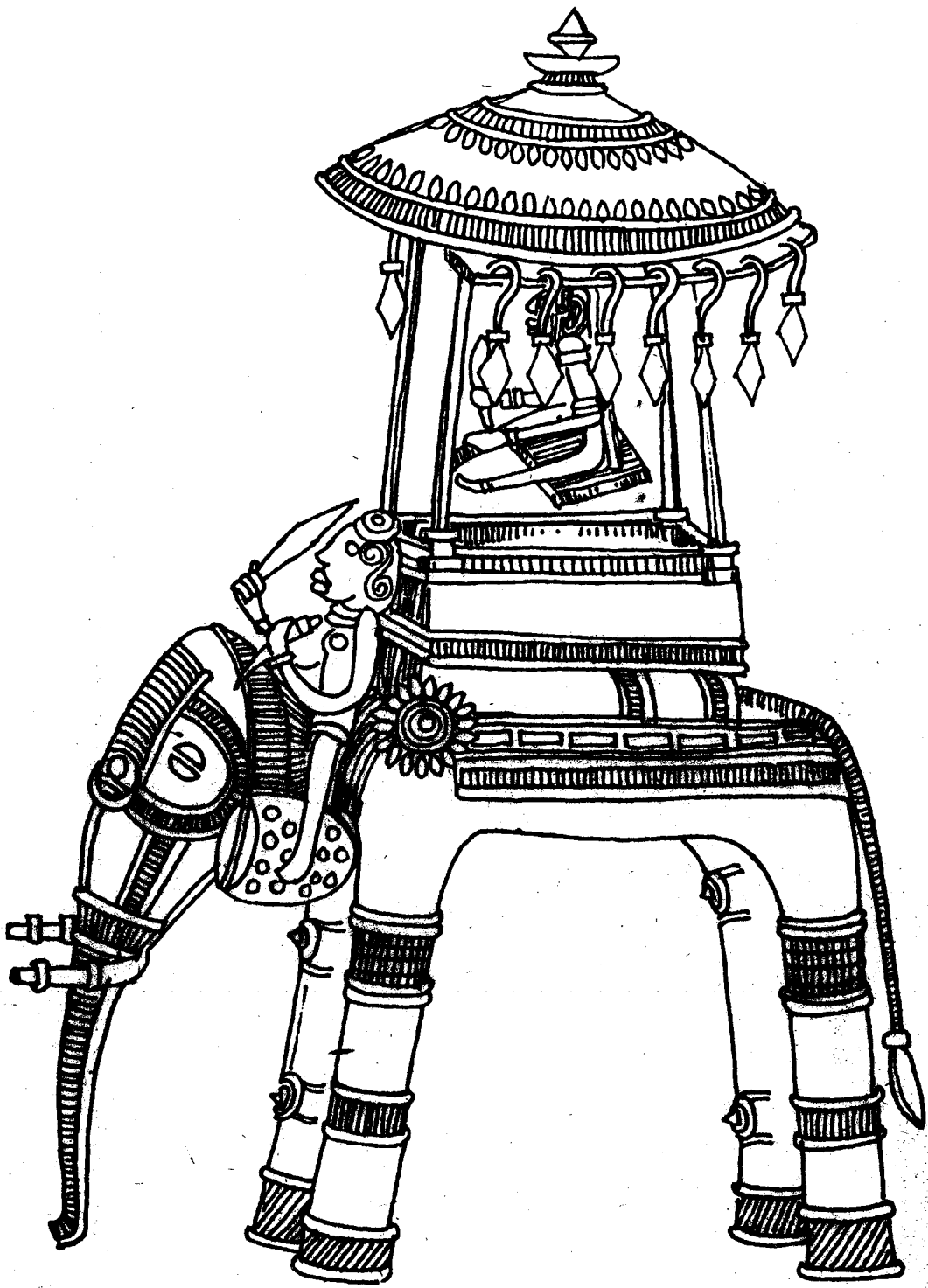
Sculpture has been known to the tribals since olden times. There are about 29 sculptors who are still engaged in this work.

#### **Terracota**

Terracota articles are made by potters who are scattered all over the district. Idols of Gods and Goddesses, replicas of animals and toys for children are made of baked clay. These articles also find way to outside markets. The number of terracota artist number about 300 and are found in all the development blocks of the district.

#### **Bamboo Craft**

Bamboo is used for making articles of general household use such as baskets, mats, jhapi, supa etc. These articles are of daily use but they exhibit artistic touch of the master craftsmen and draw admiration from the user and beholder. About 325 bamboo craftsmen are estimated to be available in the district. These artisans are found at the places where bamboo is easily available.



BELL METAL ARTIFECT

Efforts have been made to bring to public view the artistic creations of these craftsmen. As a result these artisans and craftsmen have won national and state level awards. National awards have been won by bell metal, wood craft and terracota artists.

Bell metal, Bamboo craft and Terracota artisans are commonly found while wood craft and sculptors are limited to a few development blocks. The survey has so far located sculptors in Bastar development block while wood craft artisans are concentrated in Bastar and Jagdalpur development blocks. Terracota artisans are spread over all the development blocks but their exact number per development block is not known. The distribution of these artisans according to development blocks are given below since this information, it is felt, will help in organising and assisting them properly.

Development Block	Bell metal	Wood work	Sculptor	Bamboo works
1	2	3	4	5
1. Jagdalpur	42	70	-	25
2. Tokapal	11	-	-	-
3. Bakawand	28	-	-	-
4. Bastanar	-	-	-	15
5. Darbha	-	-	-	30
6. Bastar	43	81	29	-
7. Dantewara	1	-	-	-
8. Geedam	3	-	-	30
9. Usoor	1	-	-	-
10. Sukma	19	-	-	-
11. Chhindgarh	1	-	-	-
12. Bhanupratappur	-	-	-	100
13. Durg Kondal	-	-	-	25
14. Kondagaon	56	-	-	-
15. Pharasgaon	7	-	-	-
16. Baderajpur	5	-	-	-
17. Narayanpur	12	-	-	100
<b>Total :</b>	<b>229</b>	<b>151</b>	<b>29</b>	<b>325</b>

The M.P. State Handicraft Development Corporation has set up two bell metal development cum collection centres at Jagdalpur and Kondagaon. One centre for the development of stone craft (sculpture) was set up at Bastar village. These centres purchase the art pieces of craftsmen and arrange for their sale in the country and abroad through sale centres and exhibitions. In 1980, a centre for the development and collection of terracotta, artificial jewellery and bamboo articles was set up at Narayanpur. These centres arrange for the training of artisans in various crafts. Improved implements are also provided to artisans by these centres on subsidised rates. The corporation has established one sale centre at Jagdalpur which arranges for the sale of articles of craftsmen on a nominal service charge.

#### **Tasar Industry**

The Tasar industry appears to be most suitable secondary occupation for the tribals. Tasar manufacturing falls under village and cottage industry sector and can be easily within the reach of needy people living below the poverty line. Tribals have a back ground of collecting natural cocoons which are naturally produced on sal leaves. Now the number of sal trees has considerably reduced due to excessive felling and poor regeneration rate. However, this industry is still functioning in northern and southern parts of the district and about 23000 persons get some sort of employment by way of collection of tasar cocoons. The M.P. State Textile Corporation has been working in the district with a view to introducing scientific methods for rearing silkworms on Arjuna trees. It has set up eleven Pilot Project Centres in the district, each centre having 170 acres of denuded forest land. These centres multiply the basic seed and also prepare the seed for free distribution to the rearers. One centre provides employment to 500 families in producing 15 lakh cocoons per year. The Corporation is also aiming to revive the collection of naturally grown cocoons from the forest with the help of Forest Department.

The Corporation has also established two Tasar Seed Farms at Bhopalpatnam and Naimed to supply the basic seed which is multiplied at Pilot Project Centres and is given to the rearers.

One Research Station has been set up at Jagdalpur for examining and sorting out problems coming in the way of Tasar development programme. The Central Silk Board has set up a Basic Seed Multiplication and Training Centre at Jagdalpur. The object of the Station is to meet the requirements of foundation seed for multiplication and also to impart training to rearers in improved techniques of rearing. The Antya Vyavasayi Nigam has established a Tasar Weaving Centre. The Centre is producing tasar fabric and is also imparting training to local people in weaving tasar fabrics.

#### Khadi and Village Industries

The Madhya Pradesh Khadi and Village Industries Board is running centres for Khadi Production, Bamboo Products manufacturing, Correndum Diamond cutting and polishing and Savai roap making.

The Khadi Production Centre is located at village Saletola in Kanker tehsil. The centre is equipped with 50 Ambar charkhas and 7 weavers are engaged in the production of Khadi. The centre is providing employment to 35 persons. During 1982-83, Khadi worth Rs. 0.91 lakh was produced at the centre.

The Board is running a Bamboo Art Centre at Jagdalpur since 1979-80, for training tribals and harijans in the art of bamboo craft by introducing new designs and patterns which may create a wider market and fetch better prices. So far 41 persons have been trained.

The Board established a Correndum and Diamond cutting centre in 1980-81. The Centre got 29 persons trained in Correndum processing and 13 persons in Diamond processing at Surat and Jaipur. So far stones worth Rs. 0.84 lakh have been produced.

The Board is running a Savai rope centre at Golapalli. The Centre is responsible for the purchase and sale of ropes prepared by villagers of that area.

In addition to these departmental units, the Board gives financial grants to artisans engaged in activities like carpentry, blacksmithy, pottery and in the preparation of bamboo and leather articles. The Board is also active in popularising Gobar gas plants in the district.

## 2. Approach and Strategy

There is considerable controversy regarding industrialisation of tribal areas. This controversy stems mainly out of the fact that tribals in general do not possess necessary skills to take advantage of industrial technology. The social and economic life of tribals is regulated by the community by means of established codes of conduct. There are no formalised institutions having independent functioning with regard to individual requirements. Social and other relationships are controlled and regulated by unwritten traditions which owing to having the sanction of society wield tremendous influence in guiding and sustaining all activities in a given group or community. The production system is not built on surplusage or consumerism and the spirit is to manage the present without much regard to the future. For them future does not hold much meaning except in terms of their community and family and strictly in this order. On the contrary, industrial society is highly individualised and specialisation is the core of its structure. The motivation is caused by individualised value system and at decision making level community or family does not at all come into the picture. Social priorities are significantly different in as much as motivational and emotional perspectives do not go beyond the known family boundary. Sudden or even gradual industrialisation exerts tremendous impact on the individual, the family and the entire social and physical environment thereby completely transforming existing linkages in the field of production and creating new social relationships based on different criteria. Thus the two systems lack commonality and industrial society being stronger absorbs the weaker by gradually eliminating it.

The experience of other tribal areas supports the thinking that such a conflict exists. The generation which experiences the industrial onslaught completely breaks down and the next generation finds a place in the new system in the lowest hierarchy. This is one aspect of the problem. There cannot be any doubt that the process of such a metamorphosis is painful but at the same time nations cannot remain aloof from international influences and they have to compete effectively in

international markets and accordingly have to opt for a given productive system. The entire nation is constituted of both tribals and non-tribals and as such neither it is possible nor desirable that tribals be left out in a vulnerable state of non change. It will neither be in their interest nor in the interest of the state. The process of change can however be so determined as may be acceptable to the tribals and may suit their genius.

There is yet another aspect which has to be considered from the point of view of the state. Natural resources in the form of forest, minerals, sites for generating hydel power and constructing water reservoirs are mostly concentrated in tribal areas. These resources are to be harnessed for the benefit of the people in the area as well as of the state. Exploitation of these resources is bound to create conditions necessitating a change in the out look and temperament for acquiring skills and competence compatible with economic change and capable of furthering growth. What has to be decided, therefore, is not anything regarding resource utilisation but the approach, method and system of utilising it which may involve tribals both as a community and as individuals. Society has a duty towards tribals and it has to be seen that any plan of industrialising the area does not result in transforming the tribal into a mere unit in the whole social aggregate and that he is not alienated from his land.

Bastar has not experienced any large and sizeable uprooting of Adivasis from their homes as a consequence of the establishment of modern mineral excavation plant, construction of railway line, irrigation dams and reservoirs, roads and power infrastructure. Governmental fore thinking has almost eliminated the possibility of alienating the tribal from his land by ensuring that the land of the tribal cannot be transferred to non tribal by sale or otherwise unless consented by the Government. There is, therefore, no urgent problem of rehabilitating the disadvantaged tribal as is the case in many other tribal areas else where in the country. The major consideration here is to conceptualise and define a process by which the pattern and structure of existing production process may be modified to suit the requirements of industrial

development of the area with active participation of tribal people. A programme for the introduction of elementary technologies with a view to encourage improvement in the existing agripastoral production system has to be worked out.

The tribal has attained a level of handling cultivation, rearing of animals, and manufacturing simple articles of domestic and professional use. There is not much surplus produce with the tribal for experimenting with value adding processes at present but programmes under sectoral development plans have been envisaged to provide the tribal with surpluses of production in the field of agriculture, horticulture, forest and animal husbandry. Industrial outlets can therefore be conceived for the produce of these sectors by creating capabilities in the tribal in the sphere of processing and manufacturing techniques. Processing is a multimeaning term used differently in different contexts and here it has been contemplated to mean a process different from grading the produce. Industrial development, whether cottage or small scale, is based on technological inputs and hence to achieve the objective of making the tribal capable of comprehending finer techniques of production he shall have to be equipped with necessary technological know how. This approach would necessarily require upgrading of the tribal from merely a producer of primary goods to the producer of processed goods and to ensure the supply of necessary technological inputs, preferably their manufacture in the area itself. If the tribal could be made to add value to his produce by processing and converting the raw produce into directly consumable products the process of industrial development with the active participation of the tribal will positively ensue.

The proposals under agriculture, horticulture, fisheries, forest and animal husbandry are designed to produce enough raw material on an increasing scale to feed cottage and small scale industries based on such produce as coconut, cashew, coffee, fruits, tassar, bamboo, sisal, wood, agricultural produce of both edible and non-edible varieties, milk and milk products. The type of industries that are likely to be set up in the district therefore fall broadly in the following categories :



- (a) Cottage and household industries based on the raw material likely to be made available from the primary producing sectors such as Agriculture, Horticulture, Fisheries, Forest etc.
- (b) Small manufacturing and processing industries based on major raw materials from forest, horticulture and animal husbandry sector.
- (c) Small industries based on minerals.
- (d) Ancilliary industries for meeting the demand of NMDC project of Bailadilla and upcoming power projects such as Bodhghat Hydel Project and others.
- (e) Small industries for the manufacturing of inputs required for cottage industries including manufacturing of package material.
- (f) Industrial units suitable on account of climatic and environmental advantages and mainly for meeting the demand of a bigger area than the district as spinning mills, Alcohol plant based on Mahua, hydrated lime etc.

The above described categories include both cottage and small scale industrial units. However, the approach to both of them would be different as the problems of cottage and household industries are essentially different. There is a general lack of atmosphere in rural areas for the cottage industries to grow while the small scale industries need simply a concessional push for being established.

The role of cottage and household industries in diversifying employment structure as well as changing the pattern and structure of rural production is substantial since it only can provide an alternative to uneconomic marginal farming and can act as a base for general industrial development of the region. The strategy for the promotion of cottage and household industries should therefore be based on :

- (a) upgradation of technologies.

- (b) provision of required support for the supply of raw material, credit, and marketing, and
- (c) covering of identified artisans in homogeneous community groups in different areas of the district.

The establishment of small scale industries can be attempted under the general policy of dispersal of industrial establishments away from urban agglomeration. The district does not have bigger urban base and hence industrial units can be located anywhere in the vicinity of towns in the district. The general policy of providing concessions in the form of subsidies to entrepreneurs with regard to sales tax, power consumption, capital investments, margin money for loans etc. may be continued. This may however be ensured that the people of the district are involved in both manufacturing and management. The scope for establishing small scale industrial units based on the raw material available in the district is immense. However, the approach should be to establish these units with a view to fulfil local demand primarily and subsequently to meet the demand of the region. There is considerable scope for the establishment of fabrication and foundry units for Bailadilla since NMDC Project require replacement of machinery parts worth about a few crores annually. Similarly, a spinning Mill for producing yarn can be located in the district which will meet the demand of power looms in entire Chhatisgarh region.

The strategy, however, is to place emphasis on developing cottage and household industries with a view to increase technological level of tribal people during the Seventh Plan. It is with this view that establishment of big industries are not being proposed during the Seventh Plan irrespective of the fact that the district has high potential for them. A few units in the medium sector may find a place with a view to initiate the local people into higher industrial technology and to prepare the upcoming generation for the next plan of major industrial development.

### 3. Plan Proposals

There are no proposals for establishing industrial units

departmentally. Instead departmental activities are being envisaged for providing infrastructural facilities and financial incentives to entrepreneurs with a view to encouraging them for establishing their own industrial units. The department has prepared a list of feasible industries based on the availability of raw materials in the district and which may be taken up in both cooperative and private sectors. Some undertakings in the public corporate sector such as Forest Development Corporation, Agro Industries Corporation etc. may also set up some of the units. The proposals for the Seventh Plan are summarised below :

### Establishment of Industrial Growth Centres

Industrial Growth Centres are envisaged for providing infrastructural facilities to prospective entrepreneurs at such places where people from the surrounding areas assemble regularly for effecting sales and purchases. These growth centres require certain basic facilities such as availability of land, road linkages with higher order markets, electricity, water supply etc. and as such places which are hat centres and are located near urban or semi-urban areas have been considered more suitable for establishing these growth centres.

It is proposed to establish 13 Industrial growth centres for cottage industries during the Seventh Plan Period. Taking into consideration above mentioned criteria following places have been indentified for establishing these centres :

Development Block	Location of Growth Centre	Number of Growth Centre
1. Kanker	Kanker	1
2. Bhanupratappur	Bhanupratappur	1
3. Koilibeda	Pakhanjore	1
4. Antagarh	Antagarh	1
5. Narayanpur	Narayanpur	1
6. Kondagaon	Kondagaon	1
7. Jagdalpur	i. Geedam road ii. Karundi	1 1
8. Geedam	Geedam	1
9. Dantewara	i. Dantewara ii. Bacheli	1 1
10. Bijapur	Bijapur	1

The land for these centres will be purchased if government land is not easily available at these places. The centres will be equipped with constructed sheds, electricity and piped water supply. It is proposed to allot them to persons trained under TRYSEM scheme and other desirous entrepreneurs from the area. It is estimated that development of one such industrial growth centre would cost about Rs. 1.00 lakh.

### **Subsidies**

Bastar district has been placed in 'c' category which includes industrially most backward districts. Entrepreneurs in category 'c' districts are provided with various types of facilities with a view to encouraging them to establish industrial units in these districts. The idea is to dilute concentration of industrial units in bigger towns and cities as well as to achieving as far as possible uniform dispersal of employment opportunities in the State. Industries department of the State provides subsidies with regard to sales tax, interest on loans, capital investment, rent, tools and machinery etc. with a view to enable entrepreneurs in keeping costs of production within manageable limits and successfully compete with other manufactures in the open market. The district being industrially backward has not yet been able to absorb significant amounts of these inputs. Nevertheless, some progress has been made and it is proposed to make provision for providing these subsidies to new industrial units during the Seventh Plan.

### **Textile**

#### **(a) Development of Tasar Industry**

Tasar industry is the most appropriate subsidiary occupation for the tribals of Bastar since they already have a background of collecting cocoons from sal leaves. Their main occupation i.e. agriculture is mostly rainfed and does not provide them with full time occupation. The food plants required to feed tasar silkworms are available in scattered state in the forest area. The departments of Forest and Horticulture

have plans to propagate further these food plants for silkworms. Keeping in view the availability of saja (*Termanalia Alata*) trees, plantation programme of forest and horticulture department and the need for finding out a subsidiary occupation for the tribals it is proposed to encourage Tasar industry in Bastar. Already there are eleven pilot project centres established for making available Tasar food plants to rearers. The M.P. State Textile Development Corporation is willing to take up development work with the following programme.

**(i) Plantation**

The availability of Saja trees is inadequate presently for taking up any big programme of Tasar development. Scheme of systematic plantation of Arjuna plants is therefore proposed to be taken up in the vicinity of 11 Pilot Project Centres on the vacant areas of Forest and Revenue Departments which will be obtained on lease. Each centre will raise plantation on 200 hectares and the plantation will be available for rearing of silk worms within about three years. The planted area will be allotted to rearers for the production of cocoons. The plantation will cover a total area of 2200 hectares. Main activities involved in this programme will be trench digging, digging and filling of pits, plantation and maintenance etc. The staff required will be 44 supervisors and 1600 labourers.

**(ii) Construction of Mud Houses**

The accommodation available at present with PPCs is insufficient to properly preserve seed cocoons. It is proposed to erect two mud houses at each of the 11 PPCs for meeting the storage requirements. Each mud house will be 35' x 20' with a 8' wide varandah around and well protected from rat menace.

**(iii) Grainage Equipment**

The prevalent practice is to keep moths in earthen moniyas for laying eggs. After the eggs are laid the slides of body fluid from mother moths is examined to see that there is no inherent disease. In carrying out these examination earthen moniyas have to be handled quite a lot and such frequent handling makes these moniyas liable to heavy breakage.

They also occupy considerable space. It is therefore proposed to procure about 2 lakh plastic or aluminium laying boxes so as to ensure easy handling and eliminating heavy breakage.

**(iv) Incubation cum Egg Drying Chambers**

The eggs of healthy moths are thoroughly disinfected for surface contamination and then dried in the same building. To avoid recontamination, it is proposed to set up separate incubation cum egg drying chambers. One incubator with egg-drying chamber and voltage stabiliser will cost about Rs. 0.35 lakh. It is proposed to provide one incubator and three drying chambers to each P.P.C.

**(v) Reeling and Spinning Unit**

It is proposed to set up one training cum production centre where 60 persons will be trained every year in spinning and reeling. A unit of 60 reeling machines, spinning machines, Ambar Charkhas etc. will be set up for imparting training. These trainees will be helped in setting up their own units after they are properly trained.

**(vi) Marketing**

The procurement of the entire produce harvested by tribal rearers shall be arranged through cooperative societies of the rearers. The floor purchase price of the cocoon shall be decided by a committee and the cooperatives will be authorised to effect purchases at the pre-determined price. The corporation in its turn will pay handling charges at the rate of 3 per cent to the cooperative societies while purchasing the produce from them. This procedure is envisaged to save the producer from intermediaries and marketing worries. There shall be another committee which will decide and fix the price of cocoons to be purchased from the cooperative societies. This will ensure a proper price for the produce of the producer and cooperative societies.

**(b) Spinning Mill**

There are four spinning mills working in the State. One mill is in public sector, one in Cooperative Sector and two mills are

in the private sector. The number of power looms working in the State is 15000 and of handlooms about 45000. These mills do not produce sufficient yarn to meet the requirements of these looms and therefore yarn has to be procured from Rajasthan, Maharashtra and other States. Keeping these facts in view it is proposed to set up a spinning mill in the co-operative sector at Jagdalpur by the Madhya Pradesh State Textile Corporation.

The capacity of the mill will be 25000 spindals. The mill will generate direct employment for 1000 persons and indirect employment for 5000 persons. The proposal is feasible keeping in view the demand for yarn in Chhatisgarh region. The district is not cotton producing area and the raw material will have to be imported from other parts of the State. Presently yarn is being imported from outside the State and thereby the State is not getting its share of the value adding process. If the mill is established using raw material available in the State it will generate additional employment and will meet the demand of handlooms and powerlooms in and around the district. Since Jagdalpur is connected to Raipur with road there would be no problem of transportation. The Mill would require about one lakh litres of water per day which can easily be met from Indrawati river. The proposed spinning mill in the backward district of Bastar will not only help the tribals of this district but will also serve the larger interests of the State. The broad outlines of the project are :

(a) Installed Capacity	25000 Spindals
(b) Number of shifts	3 shifts each of 8 hours.
(c) Product range	Cotton Yarn of 14 S, 18 S, 24 S, 34 S, and 40 S.
(d) Plant and Machinery	Indigenous
(e) Raw Material Requirement	17000 lakh Kgs. per annum
(f) Yarn Production	25 lakh Kgs. per annum
(g) Connected Load	3000 H.P.
(h) Water required	One lakh litres per day
(i) Employment	1000 workers
(j) Project cost	Rs. 210.00 lakh

The project is proposed to be financed as under :

(i) From the promoters of the society	Rs. 45.00 lakh
(ii) Equity from State Government	Rs.400.00 "
(iii)Looms from Financial Institutions	Rs.450.00 "
(iv) Central Investment Subsidy	Rs. 15.00 "
	<hr/>
	Rs.910.00 lakh

Accordingly a provision of Rs. 400.00 lakh would be necessary for the Seventh Plan.

### Forest Based Industries

#### (a) Vegetable Tannin Extract

Vegetable tannin, extracted and properly processed can be used as a partial substitute for wattle extract in the tanning process. It can also be used as a water softening compound for boiler feed water. The spent vegetable tanstuff can be used as fuel, manure and in hard board manufacture. The raw materials for deriving such tannin extract are myrobalan, acacia and tamarind seed husk. Bastar district produces about 5500 m.t. of myrobalan annually which is mostly exported out of the district. It is estimated that myrobalan worth about Rs. 1.54 crores is exported from Bastar. The country imports about 20 to 25 thousand tonne of wattle extract. Therefore there is a case for establishing a unit for vegetable tanning extract in Bastar based on myrobalan. The knowhow regarding extraction of myrobalan tannin is available and the process can be got released by paying a lump sum premium of Rs. 3000.00 for a license of 10 year duration.

An unit with a production capacity of 3 tonne solid/spray dried or liquid extract can be established at a total investment of Rs. 41.00 lakh. Equipment would be available within the country and there will be no problem regarding the availability of raw material. With a view to benefiting the tribal people it would be more advantageous if the project is taken up by Agro Industries Corporation and during the preparatory state requisite number of tribal youth selected



and got trained for different jobs in the project.

Keeping in view the availability of Myrobalan, emblic myrobalan and belleric myrobalan in the district it is proposed to establish three plants for extracting vegetable tannin extract at Jagdalpur, Kanker and Sukma.

#### **Tamarind Powder and Tamarind Extract Concentrate**

Tamarind is an important raw material for manufacturing of its juice concentrate or dry power. There is large demand of tamarind powder in the home market. The country produces about 2.5 lakh tonnes of tamarind pulp per annum and most of it is consumed in the country. A very little quantity is exported in its native or dried condition. If the tamarind pulp could be converted into juice concentrate the product will catch up in foreign markets. The bulk of the entire production of tamarind pulp in country comes mainly from Madhya Pradesh, Andhra Pradesh, Orissa and Tamil Nadu. In Madhya Pradesh, Bastar district produces annually about 3.4 per cent of the country's produce which is worth more than Rs. 3.50 crore.

Tamarind pods are harvested once in a year when the crop ripens in winter. They are decuted, deseeded and the resultant pulp is extracted in water for use in a variety of food items while the seeds are used commercially for the manufacture of sizing powders. The Central Food Technological Research Institute has developed a process for manufacture of tamarind juice concentrate. The product achieved through this process has become popular in metropolitan cities and is fast spreading to towns. For better compactness and for greater convenience in handling and kitchen use, a method has now been standardized for the production of dehydrated tamarind powder with a free flowing nature. This process makes the product overcome the disadvantage of common practice of extracting the tamarind juice by soaking the pulp in water and squeezing it which does not extract optimum level of juice present in the pulp.

The market price per kilogram of seeded tamarind normally is Rs. 3.00 per Kg. during the season and ranges between Rs. 5 to 8 in off season. The price of deseeded tamarind pulp packed in convenient packages

ranges between Rs. 8 to 10 per Kg. The cost of production of processed tamarind powder per Kg. has been worked out to about Rs. 5.80 and it can sell in the market without any difficulty.

The viable capacity as suggested by CFIRI Mysore is 500 Kg. of tamarind powder per day in one shift. This size can be accommodated in Bastar easily since the input availability of raw material is sufficient. Infrastructure for this capacity would be 1000 M<sup>2</sup> land on which building would cover 150 M<sup>2</sup> and godowns 250 M<sup>2</sup>. The total investment required for plant of this size would be Rs. 4.45 lakh and land building and godowns will cost about Rs. 2.04 lakh. Thus the total comes to about Rs. 6.50 lakh. All the needed machinery and equipment for this process are available in the country.

The process know how can be taken from the National Research Development Corporation on payment of a lumpsum premium of Rs.5000.00. The pulp processed under standardized conditions will ensure hygienic levels of production of the tamarind powder and will facilitate households by providing good edible material in powder form with perfect reconstititional properties.

The process developed for extracting tamarind juice from the pulp is covered by a technical fee of Rs. 10000.00 on nonexclusive basis. The process involves extraction of juice from the pulp, removing insoluble solids from the juice and concentrating soluble extract under vacuum which takes the form of jelly readily soluble in water. It can be transported in bulk in lacquered cans or glass bottles. If kept in proper sealed condition there is practically no spoilage and it can be stored and used well for over a year.

The total investment for setting up a unit of manufacturing tamarind juice concentrate would require about Rs. 12.5 lakh for producing one tonne of product per day in one shift. The production of tamarind in the district may prove sufficient to keep the unit working throughout the year but in case of short fall raw material from neighbouring areas of Andhra Pradesh, Orissa and Maharashtra can be obtained to supplement the short fall.

Three composite plants can be put up by the Agro Industries Corporation or the M.P. Minor Forest Produce Development Corporation at Jagdalpur, Kondagaon and Bijapur.

### (c) Tartaric Acid

The Tartaric Acid has a wide application in pharmaceutical and food industries. It is also used in the textile industry and photographic work. The complex forming ability of tartaric acid and its salts are used with advantage in metal cleaning and polishing. The most common salt of tartaric acid "Rochells Salt" is well known for its application in electroplating and this apart, it is an important analytical reagent.

Large quantities of this chemical are being imported into the country. The conventional process of its manufacture is as a by-product of wine industry but equally effective alternate source of its production is tamarind leaves. Tamarind leaves contain 4 to 10 per cent tartaric acid depending upon the quality of leaves and this source can be exploited.

Bastar district has a large number of tamarind trees and if need be more trees can be planted as a part of plantation programme under Forest and Horticulture sectors. However, a proper assessment of the resource has to be worked out before taking up the project.

The process developed consists of digestion of leaves under suitable conditions, precipitation of the acid as calcium tartarate, neutralisation by sulphuric acid, decolourisation and crystallisation. The equipments required for fabrication of a tartaric acid plant can be procured within the country.

The approximate cost of producing 100 and 150 tonne tartaric acid per annum would be around 22.0 lakh and 29.7 lakh respectively. The profitability of 150 tonne plant is relatively more than a 100 tonne plant. The present market price of tartaric acid per Kg. is around Rs. 35.00 to 38.00 while the cost of production per Kg. comes to about Rs. 27.90. A suitable sized plant depending upon the

availability of the quantum of tamarind leaves may be established at Jagdalpur or Kanker. The plant may be established by the M.P. Agro Industries Corporation.

#### (d) Oxalic Acid

Oxalic Acid is one of the important organic acids which has multiple use as reagent, industrial raw material etc. in the textile and other industries. It can be manufactured from the bark of saja trees which are available in sufficient quantities in Bastar district. However, the quantum of the availability of saja bark shall have to be assessed since the requirement of this raw material would be of the order of 12 mt. per day to be able to produce 144 tonne of oxalic acid per year. The process for making oxalic acid would also generate residue of about 3000 mt. which can also be sold in the market. The present cost of oxalic acid is about Rs. 11000.00 per mt. and that of the residue about Rs. 80.00 per mt. There is, therefore, adequate profitability in establishing a plant provided saja bark is available in sufficient quantity.

The investment pattern for a plant capable of producing 144 mt. of oxalic acid would be about Rs. 8.00 lakh as fixed capital and about Rs. 3.10 lakh working capital. The produce would generate about Rs. 2.31 lakh gross profit after making allowance of depreciation on fixed capital and interest on trade capital at the rate of 15 per cent per annum.

The project can be handled by M.P. Forest Development Corporation.

#### Coated Abrasives

Coated Abrasives are extensively and essentially used wherever grinding, stock removal, polishing or fine finish is required. These find application in domestic as well as industrial woodwork, hard and soft ferrous or non ferrous metals, leather, bakelite, ivory or floor surface etc. and also where lacquer paint and varnish or rust removal is required. The demand is large and the produce can be utilised in the district as well as in the neighbouring areas.

The raw materials required are craft paper (Indian or European), manila paper (European or American), plainweave cloth (Indian), drillweave cloth (Indian), drillweave heavy duty cloth (Indian), quartz grain (Indian), emery grain (Indian or European), garnet (Indian), silicon carbide grain (Indian or American), aluminium oxide grain (Indian or American), animal glue of different jeel strength (Indian or American).

The process consists of cementing different abrasive grains over suitable backing surface by means of suitable adhesives. The abrasive grains used are glass, flint, quartz, emery, garnet, silicon carbide and aluminium oxide, in different grit sizes-right from 16 grits to 500 grits. Backing surfaces used are craft paper, manila paper, industrial fibre sheets, plain weave and drill weave cloth. Adhesives employed are animal glue and synthetic resins. This base coating is then converted into different sizes and shapes such as sheets, tapes, rolls etc. both on paper as well as on drill backing to suit the individual requirements at the consumers end.

A plant with a capacity of manufacturing 600 tonnes of coated abrasives or 30000 reams per year may be established in the district. A total investment of about Rs. 3.00 lakh would be needed for establishing the plant out of which about Rs. 2.0 lakh would be invested in the form of fixed capital.

#### **(f) Hydrated Lime**

Hydrated lime possesses definite advantage and is finding increasing demand in construction and various other uses such as paper, leather tanning etc. Because of this, there is considerable demand for a proper equipment for hydrating quick lime economically.

Lime obtained direct from the klin is known as quick lime. Before using it in construction, it needs to be hydrated.

Although the conversion of quick lime into hydrated lime appears to be a simple process, the reaction is governed by numerous factors which affect the properties of final product. It is, therefore, desirable that manufacture of hydrated lime should be carried out in a factory

under controlled conditions rather than in the field where hardly any control can be effected satisfactorily. Properly manufactured and carefully packed hydrated lime possesses definite and uniform properties.

In hydrated lime, the strength giving constituents are not affected during the hydration process. There is hardly any deterioration of the material in properly packed conditions, even after long storage and it is easy to handle, store and transport and can be used without any further processing at the site. It can be incorporated in mortars and plaster in exact proportions. The plasticity of the lime putty can be improved, if so desired, by soaking it in water.

Based upon the research carried out at the Central Building Research Institute, Roorkee, hydration machines have been designed. Two different sizes are now available commercially in the country capable of hydrating about 2 tonnes and 7 tonnes of quicklime per shift of 8 hours each. The design of the machine has been kept flexible so that movement of materials and consequently the contact period available for the reaction between lime and water can be adjusted so as to achieve complete hydration of the quicklime. The steam generated during the process of hydration is utilised for pre-heating the water used for hydration and thereby the speed of the reaction is accelerated. The smaller model is capable of being transported as one unit and hence it may be possible to carry it at the site of use. The lime obtained from the machine is almost in a dry state.

Bastar district has an estimated known deposits of about 850 m.mt. of lime in Kanger village only. Based on this resource a plant for manufacturing 8 tonnes of hydrated lime per day in one shift may be established. The demand of hydrated lime is large and quite a large quantity of the product can be utilised within the district looking to the generation of construction activity envisaged in the Plan. The plant can also meet the requirements of the region and the State.

The investment needed for establishing plant would be about Rs. 3.65 lakh out of which about Rs. 2.64 lakh would be for building, equipment and other necessary facilities and the rest for working

capital. Four such plants are proposed to be established in the district.

### **Khadi and Village Industries**

The Madhya Pradesh Village and Khadi Industries Board will take up development of cottage and household industries. The programme as envisaged for the development of this sector concentrates on such industries which can easily be adopted by the tribals involving not very sophisticated technology and for which raw materials can be obtained from within the district to ensure regular, timely and year round supply. The following are the proposed schemes which can be taken up profitably by the tribals and other rural inhabitants of the district.

#### **(a) Manufacturing of Agarbatti**

The forests of the district contain quite a substantial tract of sal trees which are the source of dhoop. It is one of the important minor forest produce and its annual production is estimated at 60 metric tonnes. Presently it is exported out of the district. Dhoop is the basic ingredient of Agarbatti and the present production is sufficient to establish a few units of Agarbatti manufacturing in the co-operative sector. There is no marketing problem for the produce as market for Agarbattis is already established and the enterprise can pay handsomely adequate returns on investment.

It is proposed to organise manufacturing <sup>of</sup> Agarbattis by involving tribal families and supplying them with the necessary raw material. Agarbattis can be made by hand by tribal women. It is this process of production which will involve a large number of households and provide gainful employment to them. It will require for the organiser to ensure timely supply of raw material and it is estimated that one unit will require about Rs. 60000 for three months as working capital including labour charges. This amount will be revolved throughout the year.

Manufacturing of Agarbattis through small village units using simple technology is also possible since technology used in manufacturing Agarbattis is simple and tribal entrepreneurs can easily take up

manufacturing process by employing a few workers. It is estimated that about Rs. 3.30 lakh would be sufficient for running six such manufacturing units by employing about 150 persons.

#### (b) Manufacturing of Safety Matches

Manufacturing of Safety Matches is considered an appropriate industrial project for Bastar keeping in view the abundant availability of raw material from forest sources. The technology used in the manufacture of match boxes is simple. It is proposed to establish 10 safety match manufacturing units at different block headquarters such as Narayanpur, Kondagaon, Jagdalpur, Geedam, Bijapur, Konta, Darbha, Kanker, Dantewara and Bhopalpatnam. These match manufacturing units may be given for being established to the unemployed graduates from the district, preferably tribal or may be established in the cooperative sector.

Investment pattern for one unit of 'A' type match production is estimated to be about 3.10 lakh. Out of which Rs. 42000 would go towards capital expenditure and Rs. 2.68 lakh working capital. The finances shall have to be provided on loan with low interest rate under the scheme of providing soft loan to unemployed repayable in a few yearly instalments with first three years as moratorium period. The production capacity of each unit would be about 160 gross per day for 250 days in a year.

#### (c) Manufacturing of Bamboo Articles

Bamboo is available in Bastar district in ample quantity. Its production in the district is estimated at 45933 mt. per year. The demand for bamboo articles is large. The Bhilai Steel Plant has indicated a requirement of about 3 lakh baskets per annum at a price of Rs. 1.91 per basket. Forest department can be persuaded to deliver bamboo at a price of Rs. 1.00 per piece and to prevent any misuse of bamboo so provided it is proposed that the department should provide slitted bamboo. It is estimated that two baskets can be made from one bamboo. The project may be handled by Hastashilp Vikas Nigam and the production target be fixed at 3 lakh basket per annum which is not on a higher side.



The method of having fixed centres where labour may be engaged for making baskets may not generate subsidiary work to rural households in a wider area. Looking to the tribal characteristics people from the locality of the centre are only expected for work at the centre. It will not generate additional incomes to the households in interior rural areas. The programme is capable to achieve this objective, if implemented by adopting a two way approach of propagation in the vicinity of centres where population of basket makers is concentrated and also providing facilities to scattered families in the interior rural area.

Manufacturing of bamboo baskets can be organised by adopting household beneficiary approach. Identified households may be given raw material and tools and the finished products may be collected from them once or twice a week. The household may be paid labour charges in cash at the time of collection or the households can deliver ready baskets at the predetermined centres and collect their labour charges. The cost per basket will be about Rs. 1.25 assuming knitting charges per basket to be Rs. 0.75. Adding transportation and other costs the corporation would save about Rs. 0.50 per basket to meet its costs of organising the activity in rural area. The corporation may open centres at Narayanpur Antagarh and Uhanupratappur. The villages around these centres can be benefited with a scheme like this and identified households can be briefly trained in the manufacture of baskets of the desired design. The corporation would require a capital investment for purchasing tools and raw material. Hand tools at the rate of Rs. 15.00 per set would be required for the identified households. Working capital for about three months which is estimated to be about Rs. 66000.00 can perform the function of a revolving capital.

#### (d) Bee keeping

Bastar district produces about 7.7 mt. of honey annually. Honey production at the household level is a subsidiary occupation which can generate moderate incomes to the householders. It is in this context that Madhya Pradesh Khadi and Village Industries Corporation has contemplated to help existing bee keepers by the introduction of two schemes for

providing additional equipment for expanding the activity. The assistance for new bee keepers would be continued. These schemes envisage providing 15 additional bee boxes to those who are already managing 10 bee colonies and 50 additional bee boxes to bee keepers managing 25 bee colonies. The scheme also contemplates to provide additional equipment like honey extractors, hive tools, etc.

It is proposed to cover 100 beekeepers under the first scheme and 50 beekeepers under the second. Consequently financial involvement would be to the tune of Rs. 132500 in the former and Rs. 210000 in the latter category of the proposed schemes.

The scheme does not require any raw material. The space for installing bee boxes would be on the land of the farmer. The cost of bees, their migration and feeding expenses etc. would be about Rs. 20.00 per colony. Other notional expenses such as interest on capital at 12 per cent and depreciation at 10 per cent per annum may also be included. The production estimates may be taken to be 5 Kg. honey and by product of wax at 250 grams per bee-hive. Rough estimates indicate that cost of production for one kilogram of honey would be around Rs. 8.00 while it may sell at Rs. 12.00 to 14.00 per kilogram. The wax sells at about Rs. 25.00 per Kg. It may not give very high additional income to the household but it certainly will supplement incomes to the extent of about Rs. 500.00 per annum, which by rural standards is quite handsome.

#### (e) Tannery

The district has a large livestock population and availability of hides and skins as a result of natural mortality among animals is considered sufficient for establishing few units of tannery. The technology used is simple although labourious but village level tanneries even now practise time and effort consuming processes for converting hides into usable leather. One viable unit of tannery would require about 600 hides to be treated and tanned in a year. Accordingly, establishment of 5 tannery units in the district will be in order. The establishment of such units at village level will not be feasible and hence they may be established at development block level in suitable areas.

The communities which handle hides of dead animals will be best suited to take up tannery work but persons from other communities may also establish such units. The operational part of the programme would be to organise willing persons in a cooperative society. The skin of the dead animal may be purchased from the owner at prevalent rates which is about Rs. 45.00 per skin. At the village level it may come cheaper.

The unit will require a small amount for fixed capital since ordinary building can serve the purpose and a small area for soaking and tanning pits. As a rough estimate 1000 sq.ft. of area would be sufficient for the establishment of the unit and this may not involve an investment of more than Rs. 3500.00 yearly, if taken on rent. However, if the land is purchased it will still be not more than Rs. 5000.00. Working capital would be needed to the extent of Rs. 40000.00 involving the purchase of buffalo and cow skins, tanning material, wages and other incidental expenses. One tannery unit will require, therefore, about Rs. 45000.00 to be invested.

The programme would best be looked after <sup>by</sup> the Khadi and Village Industries Corporation and they also have proper marketing outlets for the produce. The economics of a small tannery is quite profitable and the Cooperative Societies engaged in this enterprise are not liable to run into loss.

#### (f) Handloom Khadi

Khadi is associated with rural development in the context of Gandhian economics. It provides additional employment to people partially employed in rural areas and brings a measure of self reliance to the village community. Tribals use clothes to the very minimum since there was no organised weaving set-up in their economy. However, of late, spinning and weaving has been introduced and there are about 17 weavers cooperative societies functioning in the district. M.P. Khadi and Village Industries Corporation and other agencies engaged in promoting Khadi spinning and weaving are exercising some influence on the tribals and with increased contacts with people from outside the district

tribals too are developing demand for clothings. Keeping this in view and to provide additional employment for supplementing household incomes Khadi Production units are being proposed for the area which will be organised and supervised by the M.P. Khadi and Village Industries Corporation.

It is proposed to set up 25 Khadi Production Units. One unit will have 6 spindle charkha set consisting of 25 charkhas and preprocessing machines and 10 looms. A workshed would be required and working capital to provide beneficiaries with raw material for the production of Khadi thread and cloth. The produce will be purchased by the corporation at proper price. It is estimated that with these improved charkhas and looms cloth worth about Rs. 1.50 lakh would be manufactured annually.

**(g) Palm/Chhind leaf Matweaving**

Palm or Chhind leaf mat weaving is a simple art and does not involve any sophisticated technology. The skills can be acquired easily through a simple training process. This project may be taken up by M.P. Handicraft Development Corporation.

Implementation strategy proposed is household approach. It is also proposed that households covered under this scheme should be provided with financial assistance upto Rs. 600.00 per household for organising mat weaving activities and purchase of tools. It is expected that a minimum of 100 households will be covered.

There is no problem for marketing these mats since the district itself can utilise quite a substantial number of these mats. The new primary schools or Ashram schools can also make use of these mats for students. It will save expenditure on tatpatti. It is estimated that about 600 sitting mats can be created per day by the proposed households. These mats can also meet the demand of neighbouring areas. The production of mats would be about 1440 per household in a working season of eight months.

The raw material is easily available and the cost of production is expected to be nearly Re. 0.35 per mat. The price at which it can be sold can easily be Re. 1.00. Thus a household can create for itself an additional income of about Rs. 900.00 per year or in eight months of working season.

#### **(h) Bullockcart Project**

Regular employment can be provided to a large number of people through this project. The Forest Department can create avenues of such employment by decreeing that transportation of logs to the depot will be by carts and thus cart owners can get regular employment during the season as well as off season for transporting other materials to and from the forest. This arrangement can also check illicit felling by outsiders or contractors and entry into forest area can be restricted once a proper exit mechanism for the produce is worked out

The other employment providing aspect of this project is by way of constructing carts in the district. Presently tribal people are being given carts by IRDA for carrying out sundry jobs. If arrangements with the forest department are materialised two cart making projects can be established in the district.

Financial requirements for these two cart projects would be about Rs. 6.00 lakh out of which Rs. 2.00 lakh would be required for fixed capital assets and Rs. 4.00 for working capital.

#### **Handicrafts**

Tribal handicrafts have both domestic and foreign markets. With a view to promote and expand handicrafts, the following facilities will have to be created in the district :-

- (a) Provision of raw material
- (b) Training facilities for the artisans,
- (c) Provision of improved tools, and
- (d) Arrangement for the collection and sale of articles.

Teak wood is available in abundance in the district. It is sold out in the open auction to outsiders. The local artisans are forced to pay heavy prices for the same. The raw material for bell metal craft is sold to artisans at a high rate by the traders. The facilities for proper training to artisans, supply of improved tools and adequate supply of raw material at proper price will improve the quality of their products and will also fetch them remunerative prices. The arrangement for the collection and sale of articles will ensure regular employment to the artisans.

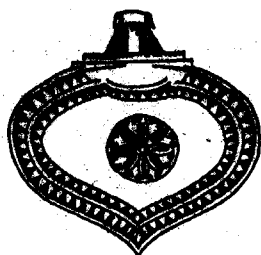
Keeping these facts in view, it is proposed to establish Handicrafts complexes at 20 block headquarters where raw material and artisans both are available and where handicrafts are carried on traditionally. Each complex will have a centre for the collection and sale of articles, a sale depot of raw materials and training facility. It will also supply improved tools to the trainees. These centres will be run by the M.P. Handicrafts Development Corporation. It is proposed to arrange two training programmes at each complex every year in traditional handicrafts to train 1000 artisans during the Seventh Plan Period. It is expected that during these five years handicrafts articles worth Rs. 8.10 crores will be produced at these centres. The arrangements for the sale of these articles will be made by the M.P. State Handicraft Development Corporation.

The scheme will require suitable buildings, provision of raw materials, tools and implements and stipend to trainee artisans.

The proposals for industrial development of the district as enumerated above would involve about Rs. 14.00 crore, the details of which are given below:

Scheme	Proposed outlay (Rs. in lakh)
1	2
1. Establishment of Industrial Growth Centre	13.00
2. Subsidies	17.00
3. Development of Tassar Industry	472.00

1	2
4. Spinning Mills	400.00
5. Vegetable Tannin Extract	123.00
6. Tamarind Powder and Tamarind extract concentrate	57.00
7. Tartaric Acid	29.69
8. Oxalic Acid	11.10
9. Coated abrasives	3.00
10. Hydrated Lime	14.60
11. Manufacturing of Agarbati	3.30
12. Manufacturing of Safety Matches	31.00
13. Manufacturing of Bamboo Basket	6.60
14. Bee keeping	3.42
15. Tannery	2.25
16. Handloom Khadi	64.25
17. Palm Leaf mat weaving	0.60
18. Bullockcart project	6.00
19. Handicrafts	160.00
	<hr/>
Total :	1400.36



## **WATER SUPPLY AND SANITATION**

### **1. General Review**

Water is the most essential input for sustaining life. The locale of human habitations in the past were decided by the availability of water and it determined the courses for the spread of civilisations. Human habitations are essentially found, nearly always, in the close vicinity of water sources. It is required not only to quenching the thirst but is put to many other uses in the daily life of human society. Broadly speaking, water availability is essential both for consumption and production activities. While other functions relating to water can be performed without much insistence on its quality, healthy living requires essentially safe drinking water. There are quite a large number of diseases which are transmitted through contaminated water. It has now been accepted by all that provision of safe drinking water and sanitary disposal of human waste are the primary needs of the people in any civilized society. The World Health Organisation has set the goals of "health for all by 2000 AD" and the UN has directed all its member countries to observe "International Water Supply and Sanitation Decade 1981-1990", the latter part of which incidentally coincides with the Seventh Five Year Plan period. During this period member countries are desired to provide adequate water supply and sanitation to their entire population. This, then, should be the target for Bastar district which notwithstanding its vast water resources is backward as far as provision of safe and adequate water supply is concerned.

The district is predominantly rural in character and village characteristics are different in degree and extent from the general pattern of villages elsewhere found in the State. The villages comprise far flung small sub settlements commonly known as hamlets, thereby making the task of providing water within the village more difficult and expensive. Further, these hamlets are spaced by intervals of considerable distance and often habitations in them are limited to a few house holds. The terrain, being generally hilly and devoid of accessible roads, further



aggravates the difficulty with regard to the construction, operation and maintenance of any system of supplying safe drinking water. The magnitude of the problem can be assessed from the fact that the district has 3388 inhabited villages and 7033 hamlets. However, any programme of alleviating the basic distress of the people cannot leave these hamlets from its ambit.

The general topography and terrain of the district are so formed that they make a large number of problem villages. As per current norms a problem village is a settlement where there is no source of safe and dependable drinking water within a radius of 1.6 km. and that the source, if it exists, has a lift of more than 15 meters. This definition is designed to generally cover villages having population closely grouped in a reasonably limited area. The case in Bastar district is different. Here the average distance between any two sub settlements within the same village is more than 2 km. and as such this definition will not hold true if it takes into account only the village and not its constituent parts. Applying the definition on space it has been found that out of the total villages and hamlets about 96 per cent are problem ridden as far as water supply is concerned. Out of 3388 villages as many as 3268 villages and out of 7033 hamlets 6770 hamlets have been declared problem villages. Dividing generally the district in north and south zones the following picture emerges.

Zone	Number of villages & hamlets		Number of problem villages	
	Villages	Hamlets	Villages	Hamlets
1	2	3	4	5
North	1724	3010	1670	2895
South	1664	4023	1598	3875
TOTAL :	3388	7033	3268	6770

The distribution of villages in the north and south is almost equal and similarly the distribution of problem villages which percentage-wise comes to 51 and 49 respectively for both the categories of villages. Hamlets however show a slight departure both in terms of the number of total hamlets and problem hamlets. Of the total hamlets north

zone possesses about 43 per cent and south zone 57 per cent while problem hamlets are 44 and 56 per cent respectively. Such a distribution of problem villages and hamlets show that the problem is uniformly present in the entire district with very little difference in its intensity. There are 51 bigger villages with population of more than 2000 in the district. Of these 32 villages fall in north Bastar and 19 in south. These villages will need piped water supply.

There are four towns in the district, namely, Jagdalpur, Kirandul, Kanker and Kondagaon. The last three towns have a population of more than 15000 but less than 20000. Jagdalpur, the district head-quarter, has a population fractionally more than 63000. The growth during the decade 1971-81 had been of the order of 72.2, 73.4, and 41.3 per cent for the first three towns respectively. Kondagaon is a newly declared town coming in this category after the last census in 1981. The rate of average annual growth of about 7.3 per cent in Jagdalpur and Kirandul and 4.1 per cent in Kanker has brought tremendous pressure on the available drinking water supply system. Water supply in Kirandul is managed by National Mining Development Corporation. Jagdalpur, Kanker and Kondagaon, water supply system shall have to be strengthened and supply augmented to meet the growing demand. In urban areas larger quantities of water are required and have to be properly treated to safe standards and supplied through a net work of distribution system into the residences of the people.

The programme of water supply and sanitation as part of providing social inputs to rural and urban areas has produced impressive results. Out of the total 3268 inhabited problem villages 2165 villages have been provided with safe drinking water. Similarly out of 6770 problem hamlets 4271 hamlets have been covered for providing safe drinking water. Thus out of a total of 10038 problem settlements and sub settlements 6436 have been covered. The achievement so far realised comes to about 64 per cent of the total problem settlements. Out of 51 bigger villages having population of more than 2000, 28 villages i.e. about 55 per cent have been covered.

The provision of safe drinking water in rural areas was made by means of handpumps. This technology is probably the only source which

can meet the need of widely scattered villages and hamlets. The efficiency of handpumps installed in the district is quite high. Out of the total 6514 handpumps installed in various villages about 91.0 per cent are in working order and about 9.0 per cent out of order. Further analysis of out of order handpumps reveals that out of the total out of order handpumps about 54.0 per cent are in a state which can be easily repaired and the rest 46.0 per cent are irreparable. In short 91.0 per cent of the total handpumps are functioning and 5.0 per cent can be made to function after minor repairs. Looking to the large number of pumps and also to the fact that these pumps are being used and operated by villagers, often roughly, the overall efficiency is quite high. The position according to the two zones is given below :-

Zone	No. of pumps			
	Installed	In working order	Out of order	
1	2	3	Reparable	Irreparable
			4	5
North	2704	2506	78	120
South	3810	3392	255	163
<b>TOTAL :</b>	<b>6514</b>	<b>5898</b>	<b>333</b>	<b>283</b>

It will be seen that working handpumps in the north zone are about 93 per cent while in the south zone they form about 89 per cent. As has been pointed out that south zone is less developed both in terms of road communication and use of technology the higher percentage of handpumps may be on account of rough use and lack of repair facilities available there.

The three urban localities of Jagdalpur, Kanker, and Kondagaon have been provided with piped water supply. Kirandul town comes under the management of National Mineral Development Corporation and the corporation manages the piped water supply to its locality. Jagdalpur water supply is managed by government agency which provides 1.25 mgd. quantity of safe drinking water from Indrawati river. Kondagaon town is also managed by government agency which supplies 30000 gallons of safe drinking water from tubewell. Kanker water supply is managed by its local body which supplies 60000 gallons of water per day from tubewell. Blockwise 1981-82 position of villages and hamlets where provision of drinking water has been made and the balance of such problem villages where availability of safe drinking

water has to be ensured is shown below :-

Blocks	Problem		Covered		Balance	
	Villages	Hamlets	Villages	Hamlets	Villages	Hamlets
1	2	3	4	5	6	7
<u>RURAL</u>						
1. Charama	96	185	96	177	-	8
2. Kanker	100	190	95	161	5	29
3. Sarona	116	213	104	160	12	53
4. Bhanupratappur	106	206	102	188	4	18
5. Durgkondal	136	210	132	175	4	35
6. Keshkal	103	189	78	125	25	64
7. Antagarh	160	241	89	114	71	127
8. Koilibeda	161	221	112	131	49	90
9. Narayanpur	139	278	108	187	31	91
10. Pharasgaon	103	172	59	101	44	71
11. Kondagaon	164	358	116	261	48	97
12. Makdi	97	141	73	99	24	42
13. Baderajpur	57	126	47	96	10	30
14. Orchha	132	165	24	26	108	139
15. Bastar	110	370	110	336	-	34
16. Bakawand	107	307	107	270	-	37
17. Jagdalpur	115	277	115	227	-	50
18. Darbha	67	216	58	154	9	62
19. Tokapal	70	212	65	166	5	46
20. Lohandiguda	79	241	65	130	14	111
21. Bastanar	38	140	30	84	8	56
22. Geedam	55	182	43	107	12	75
23. Dantewara	50	181	46	112	4	69
24. Bhairamgarh	201	244	80	84	121	160
25. Bijapur	85	248	52	159	33	89
26. Bhopalpatnam	125	155	97	120	28	35
27. Kuakonda	55	171	26	56	29	115
28. Katikalyan	37	115	17	34	20	81
29. Chhindgarh	76	213	71	162	5	51

1	2	3	4	5	6	7
30. Sukma	52	173	42	132	10	41
31. Usoor	96	174	69	112	27	62
32. Konta	180	256	168	231	12	25
<b>TOTAL :</b>	<b>3268</b>	<b>6770</b>	<b>2496</b>	<b>4677</b>	<b>772</b>	<b>2093</b>

The above situation with regard to the provision of safe drinking water relates to the availability of at least one source of safe drinking water. The problem of adequacy of safe drinking water in relation to the population has not been solved in all these villages. It is necessary to include such villages in the development frame for the future.

## 2. Approach and Strategy

The primary objective of drinking water development plan is to provide to the people in rural areas with a source of safe and dependable water supply. In urban areas the objective is to create a source wherefrom safe drinking water could be distributed to the people within the precincts of their residences. The creation of a source or the supply of water from a source inherently means the provision of adequate quantity of water in relation of the normal expected demand of the people in rural and urban areas. Accordingly adequacy norm of one tubewell for every population group of 250 in each problem village or 10 gallons of water per person per day is proposed for rural areas in the district. Thus, every problem village will be viewed from two basic objectives viz.; (i) it should have at least one source of safe drinking water and (ii) the source should be designed to meet the water requirement of 10 gallons per capita per day for the entire population of the village. In case one source of water supply falls short of the total demand in any village a second source should always be provided. This basic norm of water requirement should also be related to peculiar physiological conditions present in the district. The concept of village, as explained earlier, should not be limited to the meaning of a revenue village but should be substituted by the concept of human settlement

wherever within the territory of the district they are found.

The source of dependable drinking water is generally a dugwell or a flowing stream. It has to be evaluated whether these sources can provide safe drinking water. There is no doubt that these sources can be contaminated but bacterial entities responsible for such diseases as diarrhoea, dysentery etc. which are ordinarily communicated through water generally do not survive for more than few hours outside human body. In this context flowing river water and subterranean water are safe for drinking purposes. However, there is an element of risk which ought to be avoided. The provision of safe drinking water from subterranean or surface sources therefore need treatment to bring it to safe standards. For small settlements treatment plants are neither economically viable nor feasible to be installed in view of limited water supply needed. Given this situation and in view of the area being populated by tribals and lacking in the means of road communication, provision of safe drinking water has to be through the employment of a technology which is simple, dependable, operationally easy and economically maintainable. The machinery to be used should be sturdy enough to withstand the rough use by villagers since frequent breakdowns would make the technology unacceptable. Tubewell as a means of providing safe drinking water to the rural populace appears to be proper technologically and economically. The area has already witnessed its functioning and efficiency and hence the propagation of this method further is proposed. However, there are some villages and hamlets where tubewells have not been found successful. An alternative arrangement shall have to be made for such villages either by having the tubewell a little farther than the village and supply water through a pipe to the village or to adopt the expensive method of piped water supply. Abujhmar area of the district is most backward and the availability of drinking water there is acute particularly in summers. In addition people change their village sites often, generally in about 3 to 5 years. The creation of infrastructure for providing them with safe drinking water is a peculiar problem. However since efforts to provide them with opportunities of stable cultivation are being made it is expected that the practice of shifting village sites will be discouraged to a considerable extent. The provision of drinking water within the village may also

serve as a strong prop against frequent change of village sites. Till such a change takes place in the attitude of people the programme of creating a permanent infrastructure for the provision of safe drinking water shall have to be taken up cautiously and the beginning shall be made from villages which have retained more or less permanent sites. The creation of drinking water facility in these villages will also pave the way for bringing about change in social attitudes. Keeping these possibilities in view it is proposed to take up drinking water development programme in Abujhmar area also particularly to bring uniform development in the district.

The programme to provide at least one dependable source of drinking water in each village is the minimum objective to be achieved. It however does not obviate the necessity of meeting the bigger objective of providing adequate water to the population of a village. It is necessary to achieve the objective of the supply of 10 gallons of safe drinking water for each person per day. Therefore, villages having population of more than 250 persons will have to be provided with more than one source of safe drinking water. Bailadilla and Pharasgaon regions of the district have their own peculiarity. Here subterranean water contains soluble salt of iron and manganese which reduces the potability of water. Similarly, surface water sources also suffer from the same defect. It is necessary to make arrangements for proper treatment of water for making it potable. The only alternative in these regions appears to make provision for piped water supply after proper treatment or else to have tubewells at a longer distance from the village site to obtain potable water and supply it through piped distribution channels to the main village. The likelihood of lowering of water table due to excessive drawal of groundwater has also to be considered as it may generate more demand for new or deeper tubewells.

Efforts have to be made to bring a change in the outlook of the people in the area with a view to raise their levels of acceptability of the proposed changes in the existing sources and methods of supply of drinking water. This factor is more relevant to Abujhmar area where people are less and want to depend upon themselves. These efforts are further necessary to make people participate in the construction, operation and maintenance aspects of the programme. The objective of bringing

awareness in the people in regard to their health and freedom from incapacitating diseases is no doubt difficult but is not unsurmountable. A concerted and coordinated effort by medical, public health and social education functionaries can create proper awareness for the acceptance of changes in the traditional way of life. The people in the villages where tubewells have been provided have come to accept the technology and have shown keenness for the expansion of the facility. However peoples' participation to contribute towards meeting the costs of the works in full or partially is difficult to be achieved since in most cases they are poor and can not afford this facility for themselves on their own. The costs of providing safe drinking water to the people in rural areas of the district will have to be, at least for some time, borne by the Government.

Maintenance of the existing and new works is another area where a proper strategy has to be adopted. Unless these works are properly maintained and kept in working order the purpose of introducing this technology in rural areas would be defeated. It is necessary, therefore, to consolidate the achievements already made by providing adequate number of handpump mechanics. This objective can be achieved either by (i) appointing adequate number of mechanics in the department and deploying them in the field or (ii) training local people in each village to maintain their works under the overall supervision of village panchayat. Efforts in both of these directions has to be initiated but initially provision of departmental mechanics is a necessity which cannot be overlooked. While creating this stock of trained personnel care should be taken to recruit local persons with a view to avoid the problem of desertion of posts by employees recruited from outside the district. The work load of these mechanics should also be determined to maintain minimum efficiency level of service and repairs. It is felt, in view of the area spread, that one handpump mechanic should be given not more than 15 handpumps in his charge for maintenance purposes and when as the stock of locally trained people increases this work load will automatically be reduced.

The existing handpumps also need to be replaced by a better quality of machinery. The replacement need has to be evaluated properly.



By the end of Sixth Five Year Plan the coverage of problem villages is expected to be completed leaving about 343 villages, to be covered during the next Plan period. The balance of 772 problem villages alongwith about 331 villages out of already covered and identified for providing additional water under adequacy norms would be taken up during the remaining period of Sixth Plan. It is expected to cover about 976 villages upto the end of 1984-85. It is, therefore, assumed that the problem of providing at least one source of safe drinking water in all problem villages would have been solved and the problem of supplying adequate water would remain. This problem would also continue in hamlets and in such other villages where either tubewells are not successful or the water available is not safe to the desired standards. The expected position at the end of the Sixth Five Year Plan is as follows :

Settlements					
Villages	Problem Hamlets	Covered by the end of Sixth Plan		Balance	
		Villages	Hamlets	Villages	Hamlets
1	2	3	4	5	6
3268	6770	3141	5410	127	1360

The coverage, therefore, has to be extended to the remaining villages and hamlets during the Seventh Five Year Plan. In addition, water availability according to accepted norms has also to be ensured both in difficult villages and large hamlets. These targets, when achieved, will meet the targets envisaged for the International Water Supply and Sanitation Decade.

Water supply schemes already in existence in urban areas of the district will need expansion with a view to augment water supply to the ever growing population in urban localities. Water supply to Jagdalpur town is from Indrawati river and this sources has sufficient supplies for any augmentation programme. However, in Kondagaon and Kanker the supplies would depend upon tubewells.

Sanitation in rural areas is not a major problem from the point of view of disposal of human waste as the density of population per unit of area is very low. It is nevertheless a social problem and needs

consideration. Indiscriminate use of surroundings for faecal disposal is bound to create problems of water contamination. Tribals are accustomed to a way of life in which residential facilities for ablution and toilet are not considered necessary. They think they have whole of God's earth at their disposal. Some efforts will, therefore, be needed to initiate tribals in adopting cleaner habits of living in the interest of health and freedom from such diseases which are caused by unhealthy surroundings and contaminated water. The ideal solution would be to provide latrines to individual households or even community latrines may serve the purpose. The difficult part would be the tribal himself who has to be convinced about the utility of such a system. Social acceptability of the idea is an important factor for successful transplantation of the system in villages.

The problem of disposal of waste water as well as human waste in urban areas is real and it has to be accorded a high priority. Among the towns Jagdalpur is the biggest and likely to grow at a faster rate as compared to other towns in the district. Any action to meet the future demand will have to be initiated from now and as such Jagdalpur should have an underground drainage system. Kondagaon and Kanker can depend on low cost sanitation system for some time more as the population is not large and people in general still have rural habits. It is felt that introduction of individual residential toilet system would be easier and improved technology would be acceptable to people in these towns.

### 3. Plan Proposals

#### Water Supply

#### Rural

#### Problem Villages

The objective set for the district during the Seventh Five Year Plan is to provide at least one source of safe and adequate quantity of drinking water to all remaining problem villages and hamlets. By the end of Sixth Plan considerable coverage is expected to be achieved in the case of problem villages but there would still remain a large number of villages and hamlets to cover, such as, the balance of problem villages and hamlets, villages with unsuccessful tubewells, villages having

inadequate water supply and villages having chemically unhealthy water supply. The position at the end of Sixth Plan is expected to be as follows :

	Villages	Hamlets
1	2	3
Total Problem Villages and Hamlets	3268	6770
Balance at the end of 1982-83	1103	2499
Difficult Villages out of those covered upto 1982-83	216	426
Problem villages and hamlets at the end of 1982-83	1319	2925
Additional villages likely to be covered effectively by the end of 1984-85	976	1139
Balance of problem villages and hamlets likely to spill over to Seventh Plan	343	1786

Based on these estimates it is proposed to provide 2900 tubewells for the total coverage of problem villages with a view to creating at least one source and adequate quantity of drinking water in these villages during the Plan period as per norms laid down earlier. The target of 2900 tubewells is inclusive of 20 per cent failure factor in case tubewells may not yield adequate quantity of water. It is hoped that the drilling of 2900 tubewells would solve the initial problem of the non availability of safe drinking water in all problem villages and hamlets.

#### Unsuccessful Tubewells

There are about 400 villages where tubewells have not been successful as far as yield of water is concerned. Out of these 117 are such villages where persistent drilling of tubewells may not be fruitful and as such alternate source of providing safe drinking water will have to be found out. A small piped water supply scheme from tubewell as a source at a longer distance is feasible from where supply may be made available to these villages with the help of power pumps.

The remaining 283 villages and hamlets may be provided with new tube wells at alternative site in the village or hamlet itself where

gravel packed tubewells or deeper tubewells are considered a feasible proposition.

By the end of Sixth Plan 10 villages from the former category and 53 villages from the latter category are likely to be covered leaving a balance of 107 and 230 villages to be covered during the Seventh Plan. These places are therefore proposed to be covered during the Seventh Plan period.

#### **Chemically Polluted Tubewells**

Bailadilla and Pharasgaon subregions of the district are the areas where water from subterranean as well as from surface sources is not perfectly safe for drinking purposes owing to its contents of soluble salts of iron and manganese. This water is required to be treated properly before delivering it for use to the people. Assistance from known agencies such as W.H.O. or UNICEF may be of value for finding out some remedial measures and technology but in the mean time efforts for simple chemical treatment of water or bringing it from a longer distance and supplying it through a piped system appears to be a possible and available alternative.

There are 50 such identified villages where tubewell water is chemically polluted. Out of these 10 villages are likely to be covered by the end of Sixth Plan and as such the remaining 40 villages are proposed to be taken up during the Seventh Plan.

#### **Abujhmar Area**

Abujhmar area suffers from acute shortage of drinking water and more so of safe drinking water. The area is almost unapproachable on account of total lack of road communications, thereby making the transportation of men and machinery quite impossible. Besides, people of the area are not inclined to accept any new method of getting drinking water other than the one they are employing. Social habits are generally formed by the work pattern of the people and the physical conditions they live in. Technological inputs can help change the pattern gradually. The provision of safe drinking water within easy reach and its availability throughout the year is bound to change their habits. In spite of the fact that drilling tubewell in this area involves higher costs on account

of higher transportation costs of the machinery and difficult rocky surfaces, provision of safe drinking water is a social necessity which cannot be denied to these people. Beginning from bigger villages and hamlets having permanent sites the programme of drilling tubewells can be taken up. In fact it had already been initiated in the area and it is expected that 50 tubewells would be drilled by the end of Sixth Plan. A target of 200 more tubewells is proposed for the Seventh Plan.

The proposals in entirety for the rural water supply programme for the Seventh Plan are as under :

Scheme	Physical Target		Total
	North	South	
1	2	3	4
1. Tubewells in Problem villages and hamlets	1300	1600	2900
2. Provision for unsuccessful tube wells			
(a) Alternative Schemes	47	60	107
(b) New Tubewells	100	130	230
3. Provision for chemically polluted tubewells	15	25	40
4. Provision of tubewells for Abujhmar region	-	-	<u>200</u>
			<u>3477</u>

#### Urban

Jagdalpur town is the headquarter of Revenue Division and District. It is a growing town but is still being served with the water supply scheme designed in 1939 for a maximum population of 40,000. The present population of the town is more than 63,000 and as such the present water supply system is grossly inadequate to meet the demand. In addition to the population pressure for the supply of drinking water the town is likely to develop industrially in the near future thereby increasing the demand for water supply. In view of these developments likely to take place and the growing population it is proposed to augment the supply of water by increasing the capacity of the present water filtration and supply plant. By the turn of the century the town is expected to accommodate about a hundred thousand people and a shade more in the next decade if development programme of the district keeps to schedule. Therefore any augmentation scheme will have to be designed to meet the

requirements of water demand in the next thirty years. The present source of water supply i.e. Indrawati river has sufficient water to meet the demand of the growing town. The present water supply of 1.25 mgd. is likely to be more than doubled during the next thirty years and keeping in view this likely demand the augmentation programme of water supply is being proposed.

Kondagaon town has come up only after the Census of 1981. The existing water supply scheme is hardly capable of providing sufficient water to about 5000 people while the present population of the town is about 17000. This is, however, capable to meet the demand of about 10,000 people with rural standards which Kondagaon even now retains. During the next thirty years the town is likely to grow. The present supply of 30,000 gallons per day is not sufficient for the present population and therefore augmentation of the present water supply is being proposed.

Kanker town has a population of 15000 and the existing water supply arrangements are barely sufficient to meet the minimum demand of about 8,000 people. Kanker being located in the northern plains of the district is likely to grow at a faster rate. However, the population is likely to at least double itself during the next thirty years. It is therefore proposed to equip the present water supply project with additional capacity.

## **Sanitation**

### **Rural**

Sanitation problem in rural areas, as explained earlier is not a major problem as far as the disposal of human waste is concerned but it is one of the crucial social problems in which the cooperation of the tribal population is an important factor if it has to be tackled with an eye on the improvement of general health and elimination of water borne diseases. With a view to reducing the incidence of contamination of water sources it is proposed to provide simple pit latrines on a pilot basis in 200 villages to about 10,000 households during the Plan period. It is also proposed to impart health education to the people during implementation phase by the project staff.

**Urban**

Urban areas of the district receive their water supply through an organised water supply system and therefore it is very essential to have in these places a safe disposal system of waste water. Alongwith this system human waste should also be disposed to effect better general standards of clean living with unpolluted surroundings. Kondagaon and Kanker are small towns and there is no likelihood of any steep rise in their population. They can be managed with a low cost sanitation system for the present. However, Jagdalpur is already a big town having its population around 63,000 and likely to add to them significantly in the coming years. Therefore Jagdalpur should have an organised underground drainage system. Accordingly, a scheme of underground drainage system for Jagdalpur town keeping in view the requirements for the coming 30 years is being proposed to be taken up during the Seventh Plan.

**Maintenance**

The area of operation is not only large but also difficult in respect of communication. Therefore execution of new works and their maintenance alongwith the existing works will need additional equipment and maintenance staff. The existing technical personnel of higher level seems to be adequate for implementing the development Plan. Hence there are no proposals for additional personnel of this category. However, at the lower level it would be necessary to provide additional handpump mechanics. There are 6314 handpumps already in existence and more than 3300 handpumps are being proposed for the Seventh Plan. About 4000 India Mark II handpumps are to be substituted for the existing Mahanagar handpumps. With a view to maintaining these pumps and keeping them in working order it is proposed to provide additional 518 handpump mechanics during the Plan period.

Additional equipment needed for the proper execution and maintenance of Plan works is estimated as follows :

Equipment	Execution	For	Maintenance
1	2		3
Trucks	5		-
Tractor/Trolley	4		-
Pikup Vans	8		10
Jeeps	6		4
Motor Cycles	40		20

As is evident that development plan cannot be effectively executed in the absence of basic infrastructure it is proposed that at least a minimum necessary level of the proposed additionality of equipment may be provided to the functionaries.

The implementation of the development plan would need decentralisation of operational headquarters. The major problem in achieving this objective will be the lack of suitable accommodation for the staff of the department. Hence a minimum programme for the construction of residential and office buildings is being proposed. It envisages the construction of 23 office buildings and 273 residential houses.

#### Size of the Plan

The proposals incorporated in the development plan for safe drinking water and sanitation are estimated to cost Rs.2290.00 lakh the details of which are as given below :

Programme	Estimated cost (Rs. lakh)
1	2
1. Covering all the remaining problem villages and hamlets	725.00
2. Augmentation of urban supply scheme	480.00
3. Provision for unsuccessful tubewells	
(a) Alternative Schemes	321.00
(b) New Tubewells	69.00



1	2
3. Provision for chemically polluted Tubewells	24.00
4. Tubewells for Abujhmar region	80.00
5. Sanitation	
(a) Pilot sanitation project for rural areas	50.00
(b) Urban drainage scheme for Jagdalpur town	300.00
6. Equipment and construction	241.00
	<u>2290.00</u>

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## **MEDICAL AND HEALTH**

### **1. General Review**

Progress of any area depends primarily on the progress of its people. However, poor, unhealthy, malnourished, ignorant and illiterate people can hardly be expected to possess any intense desire to or effectively strive for social change and economic betterment. It is the sound body which is said to have the sound mind. Health of the people, therefore, should form an important component of any integrated development programme of the people since conditions of malnutrition, adverse health and mental state attuned to these situations relate to ordinary men and women who have recognisable identities as members of family groups situated in a particular socio-economic and physical environment. The causes whether environmental or social or economic or a combination of all these factors which contribute to produce adverse health need to be identified according to different geophysical conditions. The solutions too should be human and satisfying to the tradition bound communities. Malnutrition and ignorance regarding disease generating factors are the two main causes which need to be remedied urgently and unless these are controlled and eliminated no amount of medical facilities can improve the health of the people of the district. Establishment of medical institutions to cater to the needs of people for curative therapy is essential but more essential is the need to take preventive measures with a view to reducing the incidence of illness and frustration among the people.

#### **Diseases**

Broad indications of widespread maladies can be had from analysing the causes of death. The data relating to the causes of death as revealed by registered cases of death in the district can provide information of the nature and extent of diseases which may be required to be controlled for improving general health of the people.

It is true that the data available for this purpose suffer from many inconsistencies of classification of diseases and coverage of population, yet it can provide an indication regarding the type of diseases ordinarily prevalent. A look on the data provided below may provide some direction for action :

Year	Diseases as cause of death						
	Cholera	Smallpox	Plague	Diarrhoea and dysentery (No.)	Cough and respiratory ailments (No.)	Fever (No.)	Others including accidents and injuries (No.)
1	2	3	4	5	6	7	8
1979	-	-	-	1926	679	9363	3945
1980	-	-	-	1135	734	8245	4393
1981	-	-	-	1344	875	7148	4305
1982	-	-	-	832	764	5849	5701

The diseases enlisted above are ordinary and are commonly found throughout the State. Among them there is no disease specific for the district. Nevertheless, classification of diseases has concealed many important aspects necessary to frame preventive strategy. Fever is an omnibus term and may include any disease ranging from malaria to typhoid. Cough and respiratory ailments may include any disease from asthma to tuberculosis. These limitations of the data are no doubt serious and there is need to go into details for arriving at any reasonable conclusion. Data regarding other common diseases found in the area would also be worthwhile to be examined. Departmental efforts to locate cases of leprosy, tuberculosis, malaria etc. throw some light on the magnitude of the prevalence of these diseases. The following is the result for Tuberculosis :

Particulars	Years		
	1981-82	1982-83	1983-84 upto Dec. 83
1	2	3	4
Total cases examined	3679	2894	4809
Positive cases	261	930	1473

These cases were new cases detected during the regular survey conducted for this purpose and they indicate the state of health of the people in rural areas and their living conditions. Malnutrition appears to be the premier cause for widespread incidence of this disease as is indicated by the proportion of positive cases. Tuberculosis is a widely spread disease in the district and it is estimated that there are about 1.8 to 2.0 lakh cases in Bastar district which require prompt attention and better antitubercular action.

Leprosy is another disease which has significant incidence in the district. Incidence of leprosy in the northern parts of the district is midendemic having 2 to 5 cases per 1000 of population while in southern half it is hyperendemic where the incidence is about 5 per thousand including geographical pockets having leprosy incidence as high as 20 per 1000 or more. The population is being surveyed for detecting cases of leprosy. The following is the result of survey for the detection of new cases for three recent years :

	1981-82	1982-83	1983-84 upto Dec.83
	2	3	4
Population covered	150632	343887	168141
New leprosy cases identified	437	1280	995

The proportion of leprosy cases in the population underlines the necessity of covering larger population in rural areas to determine the extent and identifying new cases suffering from this dreaded disease. It is necessary to provide adequate medical facilities and to make arrangements for segregating diseased people from the healthy with a view to check its further spread.

Malaria is commonly found affecting people particularly in rural areas and it is being considered as one of the major public health problems of the district. The district contributes to nearly 20 per cent of the total incidence of malaria in the state and of the

total mortality due to malaria in the state Bastar shares about 75 per cent. The epidemiological situation of malaria in the district for the last three years was as follows :

	1980	1981	1982
1	2	3	4
Blood Samples examined	250037	327691	318560
Found positive	43968	50282	36361
pf.	29225	37029	28351

The incidence of plasmodium falsiparum is quite high. This strain causes cerebral malaria which often proves fatal. Looking to the terrain and entomological situation it is essential to intensify antimalaria measures.

The tribal population severely suffers from vitamin-A deficiency and incidence of Trachoma and cataract is high. It is estimated that roughly about half of the school going children suffer from vitamin-A deficiency. However, cataract cases are almost in the same proportion as elsewhere in the state. Cataract blindness is curable by simple operation.

Apart from the diseases stated above the occurrence of other diseases such as tetanus, infectious hepatitis poliomyelitis, encephalitis etc. is also common. The existence of diseases transmitted sexually is quite significant and skin diseases are commonly frequent. During the period from January 1983 to December 1983 known cases of these diseases were as follows :

Disease	Number of cases	
	Cured	Not cured
1	2	3
STD	4152	-
Tetanus	9	-
Infectious hepatitis	199	2
Encephalitis		1

1	2	3
Poliomyelitis	1	1
Dysentery	5921	5
Tuberculosis	290	12
Whooping Cough	952	-

What can be concluded from the above general survey of the situation is that data base regarding various diseases according to different areas has to be strengthened. It also follows that apart from the common diseases which are also found in other parts of the state there is considerable impact in the district of such diseases as leprosy, tuberculosis, malaria, skin ailments and those sexually transmitted. The reasons for most of them can be found in the physical environment, living conditions and sociocultural habits of the people.

#### Medical and Health Institutions

During the past decades of planned economic and social development governmental efforts have created infrastructural base for providing medical relief to the people and educating them for changing their living styles and taking proper health care. Presently there are 669 institutions catering to the medical and health needs of the people of the district. These institutions include one district hospital, 2 civil hospitals, 33 primary health centres, 33 additional primary health centres, 49 mini primary health centres, 48 ayurvedic dispensaries, 6 civil dispensaries and 497 sub health centres. The district hospital provides facilities for indoor patients and is equipped with 170 beds. Sanction to upgrade 4 primary health centres at Narayanpur, Tokapal, Dantewara, and Bhanupratappur to 30 bedded hospitals has already been accorded and these institutions accommodating indoor patients would now serve more effectively the needs of rural population of these areas. Besides these institutions, Dandakaranya project runs a 50 bedded hospital at Kondagaon, 3 primary health centres and 2 dispensaries. In addition there is one hospital and one mini primary health centre run by Bailadilla Iron Ore project. These institutions together provide

facility of 436 beds for indoor patients.

National Malaria Eradication Programme has started in the district since the inception of the programme. There are two NMEP units working in the district, one at Jagdalpur and the other at Kanker. *Plasmodium falciparum* containment programme has also been launched since 1977 with the help of central government and WHO. This programme further strengthens the resources and intensifies malaria eradication programme. The combined efforts of both these programmes have brought down the total incidence of malaria in the district but it has not been fully controlled owing mainly due to inadequate manpower and material. In fact the programme has not yet been able to achieve consolidation phase.

The tribal population suffers from Trachoma and cataract cases are common leading to the occurrence of blindness. The fight against blindness is on by organising eye camps for conducting operations. During the year 1983-84 some 24 eye camps were organised. Eye operations during the last three years were 739 in 1981-82, 1642 in 1982-83 and 3706 upto Feb. 1984 in 1983-84. The incidence of cataract is estimated to be about 6 per thousand. The incidence of error in refraction is estimated to be about 10 per cent of school going children. These estimates underline the need of augmenting the programme for controlling blindness on a larger scale. One Eye Mobile Unit has been sanctioned. The District Hospital has been upgraded with a view to serve more patients and it is likely to be better equipped in the near future.

Tuberculosis is widely spread in the district. Medical capabilities have, however, not been adequately created to meet the challenge effectively. There is only one T.B. Clinic in Jagdalpur having a ten bedded capacity and one MMR unit is attached to it. The facility needs to be augmented.

The district has a large number of STD cases. In the context of tribal area the control on the spread of STD cases is of importance. There is one STD clinic at Jagdalpur. Three STD mobile clinics located

at Jagdalpur, Tokapal and Antagarh are also functioning. These do not appear to be sufficient looking to the size of the district, difficult terrain and large inaccessible areas.

The incidence of leprosy in the district is significant. The survey for detecting new cases of leprosy is being conducted but so far it has only covered about 55 per cent of the population. The District has one leprosy control unit. There are 24 leprosy survey and treatment centres, two leprosy houses and one leprosy hospital. Leprosy is an incapacitating disease and sooner it is controlled better it will be for the society.

The district is being served by Family Welfare and Mother and Child Services. Family Welfare Programme has been taken up both to reorganise the family structure and to improve the health of the mother and the child. The number of eligible couples identified in 1983-84, during the survey are as follows :

No. of living children	No. of eligible couples	
	Rural	Urban
1	2	3
0	24045	1359
1	42857	1018
2	36455	1256
3	25018	1290
4	21568	806
5 & above	15253	955
	165196	6684

The number of eligible couples having three or more living children are 61839 in rural and 3051 in urban areas. All methods of family planning have been introduced in the district.

The services rendered for the health care of mother and child include distribution of vitamin tablets, preventive measures for diseases in small children, distribution of iron tablets to mothers and preventive doses of titanium dioxide.



The distribution of medical and health infrastructure created so far according to different areas of the district can give some idea of its effectiveness. The district is divided into 32 development blocks and following is the distribution of medical and health institutions according to them :

Zone.	Number of								
	Dev. blocks	Inhabited villages	Civil hospitals	PHC	Addl. PHC	mini PHC	Civil Dispensaries	Dis-pensaries	Total
1	2	3	4	5	6	7	8	9	10
North	5	567	1	5	4	3	4	10	27
Central	16	1755	2	16	17	29	3	17	84
South	11	1066	2	12	11	17	1	19	62
	32	3388	5*	33	32	49	8	46	173

\* includes two hospitals run by DNK and NMDC.

The number of inhabited villages served per institution comes to about 21 villages in the north, 21 villages in the centre and 17 villages in the south. If to these villages are added the number of inhabited hamlets the number served per institution becomes 58, 64, 51, respectively in north, centre and south. The number of Sub health centres are not included in the number of institutions used above and by adding these the number of inhabited settlements served per institution comes down to about 16 settlements. However, mere number of settlements served does not provide the real picture without considering the important aspect of terrain and distances. These obstacles are so formidable that people living in interior areas of the district cannot, inspite of their desire, utilise the services provided by these institutions when they need them. The existence of the institution is something different than the real utilisation and what matters is the latter which has to be ensured.

The other aspect of the problem is the availability of doctors and other paramedical personnel. Bastar district being tribal area and devoid of modern facilities generally disuades development functionaries to remain at the place of their posting. The position for 1983-84 is given below which will provide an indication of the magnitude of the problem :

Category	Posts	
	Sanctioned	Vacant
1	2	2
Assistant Surgeons		
(i) Male	176	44
(ii) Female	10	4
Ayurvedic Doctors	48	9
Health Instructors	108	71
Asstt. Maternity Nurse	592	254
Compounders	170	85
Public Health Assistant	99	48
Block Extension Assistants	33	15
Laboratory Technicians	33	27

These vacancies of technical personnel reduce the effectiveness of the institutions.

The services provided by these institutions in terms of area and population served do not appear to be sufficient. However, conditions can be created for the effective utilisation of existing facilities by improving accessibility to rural areas. The existing situation is summarised below :

Tehsil	Area served per institution Sq.Km.	Population served per institution (000)	Population served per bed(000)
1	2	3	4
Bhanupratappur	193.6	7.8	5.9
Kanker	184.9	13.7	4.2
Narayanpur	353.8	13.1	7.0
Kondagaon	248.9	12.5	9.2
Bijapur	401.0	8.1	6.4
Dantewara	155.6	8.1	8.1
Jagdalpur	147.1	10.8	2.2
Konta	237.4	9.5	6.7
District	223.5	10.5	4.2

It would appear that two northern tehsils of Bhanupratappur and Kanker, one central tehsil of Jagdalpur and one southern tehsil of Dantewara are best served but there too the area per institution is more than 150 sq.km. except in Jagdalpur where it is 147 sq.km. The norm of one medical institution for every 10 thousand population is achieved in about four tehsils, but it is not the real indicator of the obtaining situation. In Konta one institution has to cover about 237 sq.km. to serve about 10 thousand population and 401 sq.km. in Bijapur to serve about 8000 people. As indicated earlier, population norm would not be a correct and true indicator of the situation. The district itself has a density of population of about 46 persons per sq.km. and thus the present availability of one institution for about 11 thousand people in the district cannot be considered a satisfactory position since each institution on an average has to cover about 224 sq.km. of sparsely inhabited inaccessible area lacking means of communication. Most of the area is not accessible for

about five months in a year while some of the area is accessible for about five months in a year. In these situations the norms of population and area for providing a medical or health institution has to be revised in case of Bastar. The test of these facilities is their use by the people. Considering the limitations of these medical and health institutions to reach out to the people in their area of operation the utilisation of their services is quite satisfactory. The beds provided combinedly by all institutions remain occupied for about 40 weeks in a year assuming their occupancy per patient for about a week which is not unreasonable since people here do not come to hospitals to be admitted if they can avoid it. To remain in hospital away from their kith and kin is an emotion to be hardly digested by these people. Similarly, on an average, 1713 new patients and about 2407 old patients utilise the services of medical institutions daily. This again is a satisfactory achievement considering the availability of doctors in medical institutions and in view of the fact that not only most of the areas in the district are inaccessible but people also have faith in the traditional methods of girahas or tribal healers of the village.

## 2. Approach and Strategy

Issues emerging out of the analysis of existing situation relate to the prevalence of largescale malnutrition among the tribals of the district, insufficiency of medical and health institutions and the removal of basic causes leading to ill or adverse health. Tackling of these issues and creating favourable conditions will necessarily involve multisectoral approach and the provision of medical facilities alone cannot produce sufficient impact on the prevailing situation.

Malnutrition is a general malady which covers the state extensively but in case of tribal people of the district it is in existence mainly due to severe disturbance of ecological balance in the area. Tribals were dependent on forest produce and wild animals for their dietary supplies. Agriculture although practised in all areas of the district was to a great extent only nominal in character

as is evident with the rudimentary practices prevalent still in some areas. With the disappearance of forest and erosion of thin fertile layer of soil the tribals have been subjected to having low yields of coarse grains they cultivate and almost total deprivation of small game which was responsible for upgrading the quality of their diet. The supply of other forest produce has also substantially been dwindled. It is true that tribals have started adapting to the conditions obtaining around them but it will take a long time span to again achieve equilibrium and if left alone the social cost of the process would be too high. The vicious circle of traditional technology, low productivity, low and imbalanced consumption, and adverse health will continue to operate till it is broken by introducing appropriate technology of production ensuring high and better yields which in turn will improve dietary intake. The solution of their problem to a large extent depends upon the successful implementation of agricultural and horticultural programmes.

Insufficiency of medical and health institutions is relative to different situations. The availability of one medical and health institution for about 10 thousand population should not be considered insufficient since morbidity rates are generally not so high as to warrant establishment of hospitals for lesser groups of population. The general morbidity rate for the district is about 35 per cent which would give about 3500 patients per 10 thousand population or about 10 new patients a day. However, in case of Bastar, area assumes primary importance. One institution for 10000 population would cover an area of slightly more than 217 sq.km. This is an unduly large area in case of Bastar where road communication is poor and where there is no convenient means of transporting patients to the nearest hospital or dispensary. In case of medical assistance time is of essence. Therefore, the existing strength of medical institutions is inadequate. The inadequacy exists on other counts also and that is the availability of doctors, availability of building for the institution and availability of medicines. In rural areas medical shops do not exist and mere availability of the doctor which in fact

is not available in about 48 per cent cases, is not sufficient. It is however also not possible to open hospitals and dispensaries in every village and maintain the supply of necessary inputs covering the long and arduous lead from the town. An alternative strategy therefore becomes imperative. It is felt that the problem can be tackled by adopting a three dimensional action plan, i.e. (1) opening up of area by constructing all weather roads and approach roads, (2) making existing medical and health institutions service worthy by providing them with proper equipment and ensuring posting of qualified and trained personnel and (3) improving the mobility of doctors to reach the patients instead of patients coming to them.

Opening up of area is a necessity which can only be overlooked at a very high social cost. The consideration of keeping the tribal safe from outside exploitation is a worthy cause but it should not be achieved at the cost of the progress of the tribal. The inaccessibility of the area in most of the cases goes against the interest of the tribal. From medical point of view it is in times of epidemics that neither the tribal can reach out nor the medical personnel can reach him and the result is high mortality without any medical help. In spite of best of intentions the tribal cannot be helped when he is in dire necessity. These epidemics apart medical aid is a felt necessity which every human being should get. And this brings the second aspect of the action plan wherein emphasis is on the provision of all necessary equipments and posting of doctors. The Government has already sanctioned a package of allowances to all personnel posted in Bastar and it is hoped that now qualified doctors and paramedical personnel would be encouraged to work in the district. The next step should be to increase the mobility of doctors within the area. It would be worth while to provide medical personnel with motorbikes which is the only vehicle possessing greater potential to reach interior areas. The doctors and other health functionaries should necessarily be required to visit villages in their area on specific days and also hold camp at weekly market centres. For this purpose mobile units of medical personnel should be formed and they be provided with mobile

clinics equipped with medicines and other necessary instruments.

The strategy for providing medical aid to the people also envisages construction of buildings to house health centres, dispensaries and sub health centres. The system of modern medicine cannot function without proper buildings. Residential buildings in villages where doctors are expected to live and do duty are also essential and a phased programme of construction of residential buildings should be taken up. Most of the interior areas of the district are cut off during monsoon months and thereafter for about 2 to 3 months. It is therefore essential to stock medicines in interior medical institutions with a view to ensure their proper functioning and provide relief to the villager.

Additional medical institutions may be established for specific diseases such as STD clinics, leprosy control units, construction of laboratories etc. which at present do not have adequate capacity. Additional equipment has also to be provided for carrying out diagnostic functions. Malaria control units have to be provided with necessary additional equipment to increase their mobility and to cover larger area with DDT spray.

Efforts have to be made to identify the causes responsible for the spread of diseases particularly diseases like tuberculosis, typhoid, dysentery, leprosy and STD. The action plan for the removal of the causes of these diseases would involve coordinated functioning of various departmental agencies such as Public Health Engineering, Education, particularly social and adult education wing, forest and horticulture departments. The coordinated action plan should aim at improving physical environment and educating the tribal in the methods of health care. Provision of safe drinking water in villages would certainly result in lowering the incidence of dysentery and typhoid. Educational inputs aiming at bringing improvements in living conditions, dietary habits, care of the child and mother would not only sensitize their perceptions of healthy living but will also help in bringing down incidence of diseases caused by unhealthy environment.

Health education should provide the villagers with an insight into the causes of their common diseases which undermine their body resistance and should disabuse them of their traditional beliefs as to the occurrence of diseases. Visual aids can play a very significant role in achieving this objective. It is also necessary to enlist their cooperation in improving their physical surroundings.

Institutionalisation of curative therapy is conditioned by the use of technology and it cannot be decentralised without creating a decentralised institutional base. However, preventive measures can be decentralised and the villagers ought to be associated with decentralising process. Community institutions of tribals should be made partners in carrying out field activities relating to the control of malaria, typhoid, dysentery etc. Results are the best form of demonstrations and once the villagers are convinced about the efficacy of modern methods of control over diseases by improving physical environment and successfully avoiding contracting infectious diseases, the task of achieving health to all would be made easier. However, coordinated and concerted efforts of all development departments would be an essential condition for achieving this objective. The greatest emphasis should be on raising nutritional standards of the people.

### **3. Plan Proposals**

#### **1. Upgradation of Primary Health Centres to 30 bedded hospitals**

The policy guideline adopted for the Sixth Plan has been to establish Community Health Centres envisaged to cover a population of one lakh by each centre. According to this norm the district can have 18 Community Health Centres. The objective in establishing these community Health Centres is to provide specialised medical services in gynaco cases, paediatrics, surgery and medicine. The centre may also function as a referral institution to the lower order medical institutions within the area of the Community Health Centre.



The district, however, presents a peculiar characteristic of small population in a vast area. As a result of this low density of population per square kilometer the area coverage becomes unduly large for one institution particularly when the availability of road and rail mileage is poor. Apart from this aspect of the problem another consideration is also important which relates to the regional linkages of tribals. Tribal communities have well established area linkages. They generally do not move out of their established jurisdiction and are generally apathetic to utilise available services outside their areas of operation. The establishment of Community Health Centre according to the population norm is likely to disturb this delicate area balance.

Keeping the above considerations in view it is proposed to upgrade the existing Primary Health Centres into 30 bedded hospitals. Primary Health Centres generally conform to the boundaries of different tribal concentrations in the district and have established a sort of acceptance among the tribals of the area. It is felt that upgradation of Primary Health Centres to function as Community Health Centres with qualified staff providing specialised medical services would be more suitable for the area. These institutions would however continue to perform the functions of Primary Health Centres.

## **2. Additional Beds in District Hospital**

The District Hospital serves both urban and rural population. By virtue of being located at the important place of district head-quarter and being properly equipped as compared to other hospitals in the district both in terms of doctors and equipment it assumes a status of its own where people from rural areas come with great confidence. The pressure on the resources of a district hospital is therefore considerable. Keeping this fact in view and also the likely increase in the number of patients owing to improved road communication and general level of awareness, it is expected that District Hospital will play an increasingly important role in future. The District

Maharani Hospital has a provision of 170 beds at present and 130 beds are likely to be added by the end of Sixth Plan. In view of the above stated situation it is felt that this hospital should be made 400 bedded well equipped hospital. It is proposed therefore to provide 100 additional beds to this hospital during the Seventh Plan.

### **3. Additional Special Staff for District Hospital**

The District Hospital is not only important for the district but it is also the only institution in the area having interstate service potential. The nearest medical college hospital is at Raipur, 300 kms. away from Jagdalpur. The adjoining states of Maharashtra, Andhra and Orissa do not have any referral institution nearby. This hospital serves the people of the adjoining areas of Andhra and Orissa also. Hence, it is felt that some specialised services should be made available in this hospital in the field of medicine, surgery, gynaecs, paediatrics, ophthalmology, orthopaedics, psychiatrics, ENT, dental, anaesthesia, pathology including blood bank services, and radiology. Presently some sort of specialised services are available in the field of surgery and gynaecology but services in other fields are not adequately equipped. It is, therefore, proposed to augment and create new specialised services in above mentioned fields.

### **4. Provision of X-ray machines**

Besides the District hospital and TB clinic, X-ray facility is available at Kanker, Kondagaon, Dantewara, Narayanpur, Tokapal and Konta. Keeping in view the need of X-ray services in other areas in the context of widely prevalent diseases, it is felt that all the PHCs in the district should be equipped with the X-ray machine, Dark Room and X-ray technician. The provision of X-ray machines in all the Primary Health Centres would reduce dependence on the few centres where this facility is presently available and thus would greatly enhance the efficiency of the services.

### **5. Provision of Ambulance**

Ambulance is a basic facility which should essentially be made available at every hospital. It has already been proposed to convert

all Primary Health Centres into 30 bedded hospitals. Consequently, Ambulance Vans are also to be provided to each of these hospitals. Presently Ambulance facility is provided at Kanker, Bhanupratappur, Sarona (Vishrampur), Konta, Bhopalpatnam and Sukma. It is proposed to provide Ambulance facilities to the remaining Primary Health Centres during the Seventh Plan.

#### **6. Mobile Units**

The institutional medical facility is not likely to be available to all the persons in the district for some time to come because of long distances and difficult means of communications. The facility has however to be made available. It is also not possible to establish medical institution at all places to do away with the constraints of distance and inaccessibility. The alternative is to create mobile units which may render services of a group of doctors pertaining to different fields of specialisation. These mobile units would visit groups of different villages on specified days and will camp at important weekly market centres. The motto would be to reach the patients if they cannot reach the doctor. It is therefore proposed to create 8 mobile units in the district. Each mobile unit will consist of a group of doctors, compounder, nurse and attendants, jeep with trolley, public address equipment, furniture, instruments and medicines.

#### **6. Prevention of Blindness**

The incidence of cataract in aged persons and that of error of refraction in school going children is quite high. Children suffer from nutritional deficiency. The solution of the problem is to provide nutrition to children and to organise eye camps regularly in different areas for performing cataract operations. It is also essential to provide a 20 bedded eye ward at the District Hospital with requisite equipment and necessary staff. The present problem would however not be solved by taking these steps and something will have to be done to correct the error of refraction in children and to

provide post operation facilities to older persons. In view of poor financial status of most of the tribals it is proposed that school going children may be provided with spectacles and provision for free diet to cataract patients may be made.

(i) The problem of school going children needs immediate attention. Children are examined and are provided free medicine for eye diseases and vitamin-A tablets. It is proposed to provide students with proper grade spectacles. It is estimated that at least 10 per cent of school going children need the use of spectacles urgently. However, they are neither available in the rural markets nor most of the tribals are economically capable of purchasing them. It is therefore proposed that some 4000 children may be provided with spectacles every year during the Seventh Plan.

(ii) The incidence of cataract in Bastar is slightly higher than the state. It is necessary that every Primary Health Centre should be provided with basic medicines and equipments so that by the end of Seventh Plan no preventable and curable case should remain unattended. It is also felt that eye camps should be organised to perform as many eye operations as possible. However, it is proposed that tribals be provided cost free diet during their stay at the camps.

#### **7. T.B. Control Programme**

The incidence of Tuberculosis is very high in this district. According to one estimate there are 1.8 to 2.00 lakh cases of this disease which demand prompt attention. At present there is one T.B. clinic with 10 beds, in Jagdalpur. It is essential to provide a building for T.B. Clinic having 20 bedded wards one for male and the other for female. One T.B. Clinic and one fully equipped mobile unit for Narayanpur are also necessary. Apart from the construction of building for T.B. Clinic at Jagdalpur a building would also be necessary for the clinic at Narayanpur. Provision of MMR unit with camera and a Mobile T.B. Clinic has also to be made.

### **8. Control of Sexually Transmitted Diseases**

One STD clinic in Jagdalpur and three mobile STD clinics at Jagdalpur, Antagarh and Tokapal are not sufficient to cover this large district where incidence of STD is significant. These diseases damage human personality and transmit evil effects to the next generation. Their control and complete eradication is a social necessity of the first order. Keeping these considerations in view it is proposed to establish eight more STD clinics out of which 6 clinics would be of mobile nature with a view to cover the area extensively.

### **9. Leprosy Eradication Programme**

The Leprosy survey has been going on in the district which has so far covered about 55 per cent of the population. It has to be continued. It is proposed to make every possible effort to eradicate the disease completely from the district by 1987. It is further proposed that for the following three years, intensive search be carried out to detect hidden leprosy cases, if any, so that the certificate of eradication of leprosy could be issued by 1990.

With the above object in view 14 Model Leprosy Control units are proposed to be established. Laboratory facilities are proposed to be established in each development block. The hospitals at Jagdalpur and Kanker are proposed to be equipped with Reconstruction Surgery units. Provision for adequate supply of medicine, vehicles and equipment has also to be made.

### **10. Malaria Eradication Programme**

Malaria is one of the major public health problems of the district. With the two NMEP units working in the district at Jagdalpur and Kanker, the situation has been brought under control in Kanker and has almost been stabilised in Jagdalpur. Because of good rainfall, surface and atmosphere humidity, existence of forests etc. malaria can flare up at any time if continued and sustained anti-malarial measures are not taken. The present machinery needs

to be strengthened by providing manpower, insecticides and vehicles. The following schemes are being proposed for the Seventh plan.

**(i) Provision of Vehicles**

The present vehicle position is unsatisfactory. Most of the vehicles supplied earlier have become unserviceable and their operational costs are high. The difficult terrain and non-availability of private transportation makes it necessary to provide 4 trucks and 8 jeeps to the two units for the transportation of insecticides etc.

**(ii) Provision of Fogging Machine**

The town of Jagdalpur is not included under NMEP. Although it is a town it has all the makings of a poor town owing to the presence of open drains, non-availability of proper sewerage system and general lack of cleanliness. These conditions help breed mosquitoes and consequently malaria. To combat this situation, antilarval and antiadult measures are essential. Keeping this in view, it is proposed to provide the hospital with a fogging machine, medicine, and other operational equipments and personnel.

**(iii) Squads and Spray Equipments**

NMEP provides squads and equipments according to its own norms. The local conditions of area, terrain etc. are such that these norms prove to be inadequate. At present 321 squads are sanctioned for both the units which fall short of the requirements. Hence a provision for 40 squads, 200 stir-up pumps and 2000 nozzle tips is proposed in the Seventh Plan.

**(iv) Additional Supervisory Staff**

At present two malaria officers and 21 malaria inspectors are working in the district. The vast area of the district makes it necessary to create the additional posts in the supervisory cadre. It is proposed to create one post of Dy. DHS Malaria to supervise both the units and coordinate their work. Malaria Inspectors are proposed to be provided for every block and hence 12 more posts are to be created.

**(v) Construction of Laboratories**

For taking effective preventive measures against Malaria, a small laboratory has been established in each PHC but they have not been properly housed. Hence construction of 33 laboratory rooms one each PHC is being proposed.

**11. Construction of Buildings for Health Institutions and Staff Quarters**

Modern hospital and health technologies essentially need buildings where supporting equipments could be established. Facilities for indoor patients can only be created when the institution has its own building. A large number of medical institutions particularly in rural areas do not have proper building facility. Not only the institution should have a building but it should also have residential buildings attached to it for the doctors and other staff for ensuring their availability.

The lack of institutional buildings and residential quarters is mainly responsible for the absence of doctors from the place of their posting. The quality of medical service provided to the people can also not be improved till supportive facilities are made available in the same institution.

It is therefore felt that construction of institutional buildings and residential quarters are the primary need to consolidate what has been achieved so far. With this view it is proposed to get constructed 36 buildings for different hospitals and upgraded Primary Health Centres, 412 Primary Health Centres, Additional Primary Health Centres and Sub health centres. It is also proposed to construct some 60 residential quarters for doctors and nurses.

**12. Construction of Training Centre and Hostel for Female Health Workers**

Keeping in view the non-availability of auxiliary nurses and midwives and family health workers in the district, a training

centre has been opened in Jagdalpur with a dual purpose of strengthening the medical services and also to provide employment opportunities to the tribal girls. The centre is without a building and hostel facility. Hence buildings for the centre and a hostel for 60 trainees are being proposed to be constructed during the Seventh Plan.

### **13. Construction of Hostel for Trainees**

To meet the requirements of trained compounders, laboratory technicians, dressers and X-ray technicians; a training centre has been established at Jagdalpur but the hostel facility is not available. The facility for the tribal boys who come for training is essential. Hence a hostel for 60 such trainees has been included in the Plan.

### **14. Provision of Generators**

Refrigerators have been provided to all the hospitals and primary health centres. Due to frequent breakdown in the supply of electricity and occasionally for long spells of time refrigeration services become ineffective resulting in the loss of stored vaccine and other medicines. An alternative arrangement is absolutely necessary. It is proposed to provide three large generators, two for District Hospital and one for the Civil Hospital Kanker and 33 small generators for all the Primary Health Centres.

### **15. Blood Bank Facility**

The creation of Blood Bank at Jagdalpur is also essential in view of the non-availability of this facility in the area nearby. Blood supply in acute and urgent cases cannot wait. The nearest place from where such a supply can be had is about 300 km. away. It is therefore proposed to establish Blood Banks at Jagdalpur for the southern and at Kanker for the northern area.

### **16. School Health Programme**

Thorough medical examination of all school going children at regular intervals is a necessity requiring immediate attention. During



the Sixth Plan emphasis was laid on school Health Programme. It is now proposed that all school going children should be covered by this scheme. The programme will include the printing of health cards and supply of medicines.

#### 17. Establishment of Cold Vans for Immunisation Programme

Immunisation Programme envisages to cover extensively children and expectant mothers. The programme has got a strong support from Central Government from where vaccines are supplied. It is necessary to create a cold chain link from the receiving point to the delivery point in interior areas with a view to maintaining the efficiency of the vaccines. It is proposed for this purpose to provide one Refrigerated Van (cold van), one Walking cold unit, 12 Deep Freezers and 35 Refrigerators.

#### 18. Establishment of Vehicle and Equipment Maintenance Unit

For the maintenance of a large number of vehicles, refrigerators and other equipment, a maintenance unit consisting of the following has been proposed :

1. Senior Mechanic	1
2. Junior Mechanic	6
3. Refrigerator Mechanic	2
4. Electrical Mechanic	2
5. Helpers	6

The proposals for Development of Medical and Health Services of the district as enumerated above would involve about Rs. 20.55 crore, the details of which are given below :

Schemes	Proposed outlay (Rs. in lakh)
1	2
1. Upgradation of PHCS to 30 bedded hospitals	330.00
2. Additional beds in district hospital	35.00
3. (i) Provision of X-ray machines	30.00
(ii) Additional special staff for district hospital	12.00

1	2
4. Provision of Ambulance	39.00
5. Mobile Units	17.00
6. (i) Prevention of blindness	20.00
(ii) Provision of diet to cataract patients in camps	30.00
7. T.B. Control programme	25.00
8. Control of sexually transmitted diseases	20.00
9. Leprosy Eradication Programme	430.90
10. Malaria Eradication Programme	70.00
11. (i) Construction of buildings for institutions and staff quarters	910.00
(ii) Construction of training centre and hostel for female health workers	15.00
(iii) Construction of hostel for trainees	15.00
12. Provision of generators	4.00
13. Establishment of Blood Banks	5.00
14. School health programme	25.00
15. Establishment of cold van for immunisation programme	12.00
16. Establishment of vehicle and equipment maintenance unit	10.00
TOTAL :	2054.90



## EDUCATION

### 1. General Review

Education is considered to be a major instrument for bringing social change. It is also one of the important preconditions of economic development. Education is not coterminus with schooling yet literacy has been taken as an important index of education for want of other better indicator. Madhya Pradesh as compared to the country is below the national level of literacy. Literacy level of the state being 27.8 per cent of the population compares poorly with 36.2 per cent of the country. The disparity in the levels of literacy among males and females is substantial as compared to the country's level obtained for males and females. The state has 39.5 per cent literate males and 15.5 per cent literate females against corresponding national literacy level of 46.7 per cent for males and 24.9 per cent for females.

Within the State Bastar ranks 44th amongst the total of 45 districts. As against the state's literacy level of 27.8 per cent Bastar district has 14.1 per cent. Similarly as against 39.5 per cent literate males and 15.5 per cent literate females in the State, Bastar district has 20.9 per cent literate males and 7.3 per cent literate females. The situation in terms of literacy in rural and urban population is also unsatisfactory. The state has 21.2 per cent of the rural population as literate while Bastar district has only 11.6. The difference in case of urban population is only marginal since literacy level of 53.0 per cent in urban areas of the district compares well with 54.0 per cent of the state. The situation as obtained in case of literate males and females in urban and rural areas is given below :

(Percentages for 1980)

State/District	Rural		Urban	
	Male	Female	Male	Female
1	2	3	4	5
Madhya Pradesh	32.8	9.0	64.3	42.3
Bastar	18.1	5.2	63.0	42.0

The distribution of literate persons in various areas of the district is highly uneven. There are areas where literacy percentage in the population is more than the state average while in other areas it is much below the district average. The areas which are above the state average are in the north of the district where outside influences over the population are considerably more and which otherwise also are relatively more advanced as compared to areas falling in the southern subregion of the district. These areas according to development blocks are shown below :

Development Blocks having high literacy percentage than the state	Percentage Literacy 1981	
	Male (32.8 p.c. state)	Female (9.0 p.c. state)
1	2	3
Charama	42.8	13.4
Koilibeda	36.8	18.1
Kanker	35.2	9.7
Bhanupratappur	32.8	9.7
Dantewara		10.1

Bhanupratappur development block has just about the same literacy percentage for males as of the state but has higher literacy percentage in case of females. First four development blocks are located in the northern and north western parts of the district. Dantewara is in southern parts which has a higher female literacy percentage as compared to the state.

The areas where literacy percentage is lower than the state but higher than the district average are concentrated in the north and central parts of the district. These areas are characterised by their higher level of interaction with people from outside. There are nine development blocks which have higher literacy proportion in population for males and five development blocks which show higher female literacy proportion. They are as follows :

	Literacy percentage - 1981	
	Male ( 18.1 p.c. district)	Female ( 5.2 p.c. district)
1	2	3
Sarona	31.6	7.8
Keshkal	23.4	6.4
Antagarh	23.4	6.3
Narayanpur	22.4	6.9
Durg Kondal	22.1	-
Pharasgaon	20.4	-
Baderajpur	18.3	-
Bhopalpatnam	22.7	5.2
Dantewara	22.0	-

First seven of the above development blocks are located in the central parts of the district. The last two development blocks belong to southern parts of the district.

The development blocks covered in the above two tables represent the area where proportion of literate persons in the total population of the area is higher than the district average. The spread of literacy in these areas as compared to others in the district can be attributed to easy communication facilities and exposure of the people to outside influences. The resettlement of displaced persons from Bengal in certain areas of the district may also have influenced the conditions for the spread of literacy. However, large

tracts of the district have poor literacy ratio which is evident from the following :

Development Blocks having literacy percentage lower than the district	Percentage literacy 1981	
	Males ( 18.1 p.c. distt.)	Females ( 5.2 p.c. distt.)
1	2	3
Jagdalspur	17.6	4.4
Bastar	15.6	3.4
Bakawand	15.4	2.5
Bijapur	14.4	4.2
Makadi	14.1	1.8
Geedam	12.9	4.1
Kondagaon	12.4	1.8
Usoor	11.8	2.6
Tokapal	9.5	2.6
Lohandiguda	8.8	2.1
Sukma	8.6	2.6
Chhindgarh	8.3	1.6
Konta	7.2	2.6
Darbha	6.5	1.2
Bhairamgarh	5.6	1.3
Kuakonda	5.4	1.2
Orchha	5.4	1.2
Bastanar	4.0	1.1
Katikalyan	4.0	0.7

In this group of development blocks literacy level is below the district average. However, it will be noticed that it is relatively less below in areas which are developed otherwise. The nearness of administrative headquarter also does not appear to have greatly induced the spread of literacy as can be seen in Jagdalspur development block which is

below the district average. It will also be evident from the table that within this group of literacy-deficient-areas literacy is more in central parts and less in southern parts of the district. Taking the entire district into consideration it can be inferred that literacy decreases considerably in the central parts as compared to the north and falls sharply in the southern parts of the district. High literacy is found to be associated with northern plains and central plateau where exists a modicum of road network. There appears to be a positive relationship between easy area accessibility and the spread of literacy.

High literacy areas are characterised not only by the availability of some sort of nominal road network but also by communities which are comparatively more advanced. Charama, Kanker, Sarona, Bhanupratappur and Durgkondal development blocks located in the northern plain and inhabited mostly by Gonds and Halwas who are more advanced as compared to other tribal communities in the area, possess combinedly about 32 per cent of the total literate population of the district. The central belt consisting of Keshkal, Makdi, Pharasgaon, Baderajpur, Kondagaon, Koilibeda, Antagarh, Bastar, Bakaward, Narayanpur, Orchha and Jagdalpur development blocks are mostly inhabited by Marias and Bhatras. These twelve development blocks share about 46 per cent of the total literate people in the district. Moving towards the southern belt consisting of Bhairamgarh, Bijapur, Sukma, Chhindgarh, Katikalyan, Dantewara, Geedam, Kuakonda, Lohandiguda, Bastanar, Tokapal and Darbha development blocks it would be noticed that literacy proportion is considerably reduced. These twelve development blocks mainly inhabited by Maria tribe and an insignificant number of Parjas account for only about 17 per cent of the literates of the district. And finally the extreme southern and south western parts consisting of Bhopalpatnam Usoor and Konta development blocks and mainly inhabited by Maria and Dorla tribes claim about 5 per cent of the total literate population of the

district. The position is summarized in the following table :

Region	No. of development blocks	Main tribes of the area	Share of literate persons (per cent)
1	2	3	4
North	5	Gonds, Halwa,	32
Centre	12	Muria, Hill Maria and Bhatra	46
South	15	Maria, Parja and Dorla	22

The distribution of literate persons according to the area of specific tribal dominance provides some idea as to the acceptance of modern educational methods by these communities. Availability of free educational facilities with other incentives to children has only partially succeeded so far in spreading literacy in these areas.

#### Primary Education

School education is shared jointly by the tribal and education departments of the state government. The major share in this responsibility however is that of tribal welfare department. The norm for providing a primary school in any village is on the basis of its population. The existing norm is to provide a primary school to every village having a population of 250. According to this criterion the district would need about 3315 primary schools. The number of these institutions needed according to development blocks and their present availability is shown below :

Development Block	No. of Primary Schools according to the norm	No. of Primary School presently available
1	2	3
Jagdapur	142	142
Bastar	140	140
Bakawand	138	138
Darbha	98	98



1	2	3
Lohandiguda	89	89
Bastanar	57	57
Tokapal	94	94
Kondagaon	152	152
Makdi	96	96
Keshkal •	97	97
Pharasmaon	103	103
Baderajpur	79	79
Kanker	110	110
Narharpur	117	117
Durgkondal	92	92
Charama	119	119
Bhanupratappur	102	102
Dantewada	95	95
Geedam	86	86
Kuakonda	72	72
Katekalyan	59	59
Bijapur	80	80
Bhopalpatnam	93	93
Usoor	85	85
Bhairamgarh	127	127
Konta	125	125
Sukma	91	91
Chhindgarh	108	108
Narayanpur	113	113
Koilibeda	183	183
Abujhmar	66	66
Antagarh	107	107

It would appear that primary educational institution in requisite number have been opened in villages having a population of 250. As

has already been discussed that settlement pattern in the district is characterised by small villages with considerable inter village distances it would be necessary to further dilute the norm for providing primary education institutions to villages having a population below the existing norm. In addition a strategy shall also have to be devised to ensure proper response from the local population.

The concept of Ashram Schools has emerged from the prevalent socioeconomic conditions in the district. In remoter parts of the district where primary education facilities have not been made available children cannot be supposed to attend schools located in nearby villages for the reason of distance and safety. Children belonging to 6-11 age group are also supposed to learn the intricacies of life in their environment and they generally move with their mothers and grand parents to the forest area for collection of forest produce for their daily use. This from their point of view is part of the learning essential for children. Primary schools in such a situation do not serve the desired purpose. With a view to netting these children for educating them for the life expected with the change in socio-economic milieu the concept of residential primary schools or Ashram Schools has emerged wherein children would stay and study. Children are to be provided with board and lodging facilities. There are no fixed norms laid down for opening a Ashram School but generally remoteness of the village, poor literacy, absence of primary educational institution are some of the considerations for opening an Ashram School. It is also considered at present to be more suited to the girls rather than boys. In a situation obtaining in tribal areas of Bastar where woman is considered partner in economic endeavour rather than a burden on the family, educated girls can bring social change much more speedily. Ashram Schools for girls are therefore a necessity of the first order. However, Ashram Schools for boys should also be found essential on this account as it is the next generation which should be targetted for bringing social and institutional changes in tribal areas. With the existing approach it is estimated that about 202 Ashram Schools would be needed in the district. Presently 52

Ashram Schools in different areas are functioning in about 18 development blocks. Highest number of existing Ashram Schools are in Abujmar area. Existing position of Ashram Schools in different blocks is as under :

Development Blocks	No.of Ashram Schools	Development Blocks	No.of Ashram Schools
1	2	1	2
Bastar *	3	Katikalyan	1
Lohandiguda	1	Bhopalpatnam	2
Bastanar	3	Usoor	4
Keshkal	1	Bhairamgarh	6
Durgkondal	1	Konta	4
Bhanupratappur	2	Sukma	2
Dantewara	4	Chhindgarh	4
Geedam	2	Narayanpur	1
Kuakonda	1	Orchha	10

Ashram Schools are well suited to the conditions obtaining in the district and they can prove effective instrument in spreading education.

### Secondary Education

Middle Schools or secondary educational institutions are presently opened on the basis of existing primary schools. One Middle School, according to the present norm, is to be opened for every six primary schools and the distance required to be covered

by every student should not be more than 10 km. According to this criterion minimum number of middle schools required in the district would be about 565. As against this requirement there are 530 Middle Schools in existence. The distribution of these institutions according to various development blocks is shown below :

Area	No.of Institutions as per norms	No.of Institutions in existence
1	2	3
North	98	106
Central	240	217
South	227	207
	565	530

There is a small gap between the requirement of middle educational institutions and their present availability. The gap is marginally larger in central region than in southern parts of the district. However, opening of secondary educational institutions are related with the outturn of primary schools and if primary schools are not in a position to feed Middle Schools to their full capacity resource allocation in creating them may prove unproductive.

#### Higher Secondary Education

Similarly Higher Secondary Schools are dependent upon the outturn of Middle Schools. According to the present norm there has to be a Higher Secondary School for every 16 Middle Schools, with a minimum of at least one H.S.S. for boys and girls separately, in every development block. There would therefore be a minimum requirement of about 64 H.S.S. in the district taking into consideration also the terrain and distances involved. The existing number of Higher Secondary Schools in the district is 63 for boys and 3 for girls. The objective of having at least one Higher Secondary School in each development block has been achieved for boys in all except Abujmar (Orchha) development block. The number of Higher Secondary Schools

for boys and girls according to broad classifications of area is as follows :

Area	Institutions for			
	BOYS		GIRLS	
	as per norm	in existence	as per norm	in existence
1	2	3	4	5
North	14	14	6	1
Central	29	28	13	2
South	21	21	15	-
	64	63	34	3

It is evident that the objective of having one Higher Secondary School for girls in each development block has not been achieved and there is a wide gap between the requirement and availability of girls Higher Secondary Schools in the district.

The availability of educational institutions in the district appears to be satisfactory according to the prevalent norms except in case of Higher Secondary Schools for girls. The degree of their utilisation can only be judged by the number of students in each category of institutions. The number of students in each category of institutions is shown below :

Category of Institution	No. of students		
	Total	Males	Females
1	2	3	4
Primary Schools	160972	110097	50875
Middle Schools	17554	13129	4425
Higher Secondary Schools	15830	11551	4279

The average strength of a primary school comes to about 48 students with a male female proportion of 2.2:1 and that of middle school

about 33 students having male female proportion of about 3:1. The male female proportion for higher secondary education is slightly lower than obtaining for secondary education i.e. 2.7:1. The drop in the number of students in the secondary education is quite steep and indicates a high dropout ratio between primary and secondary education. The dropout ratio from primary to secondary is bigger in case of girls as compared to boys. However it is also indicated that once boys and girls reach secondary stage the dropout ratio for higher secondary becomes less pronounced.

The coverage of targetted population in specified age groups for school education is however not unsatisfactory. The proportion of children enrolled to the total number of children in the respective age groups is shown below :

Year	(Percentages)					
	Age groups					
	6-10		11-13		14-16	
	Boys	Girls	Boys	Girls	Boys	Girls
1	2	3	4	5	6	7
1980-81	83.0	39.4	17.4	6.5	13.5	4.4

Total coverage of the targetted age group for primary education has not been achieved but the coverage of 83.0 per cent of the total boys in the age group is not an achievement to be ignored lightly. However, efforts have to be made to get full response in case of girls.

### Collegiate Education

Facilities for higher education have been created in the district. There are eight colleges in the district and one of them is for girls. These colleges are located at the following places :

	Year of opening	Enrolment
1	2	3
1. Jagdalpur (Boys)	Old	332
2. Kanker	1975	671
3. Jagdalpur(Girls)	1982	113
4. Sukma	1982	12
5. Kondagaon	1982	42
6. Dantewara	1982	13
7. Kirandul	1983	43
8. Bhanupratappur	1983	-

The colleges at Sukma, Dantewara and Kirandul are arts colleges while colleges at Bhanupratappur and Kondagaon have both arts and commerce faculties. Colleges at Kanker and Jagdalpur have arts, commerce and science faculties. The college for girls at Jagdalpur has the facility for the study of Home Science in addition to arts subjects. The post-graduate teaching facility in arts and commerce subjects is available in the colleges at Kanker and in arts, science and commerce subjects in the college at Jagdalpur. The college for girls at Jagdalpur has post-graduate teaching facility in sociology.

#### Technical Education

The increasing industrial and mining activity in the district is opening new avenues of employment for skilled workers and technicians. Various government departments in the district have provided educational and training facilities to tribal youth with a view to making them capable of taking full advantage of the employment opportunities generated by gradually increasing industrial and mining activities. An Engineering College at Jagdalpur has been established recently with Civil Engineering course. It has got 40 seats.

The Tribal Welfare Department is running three training cum production centres at Dantewara, Narayanpur and Kanker. Training is imparted to young persons in skills like carpentry, blacksmithy and tailoring. These persons are encouraged to start their own units as self employed workers after the training is completed.

Two industrial training institutes one at Bastar and the other at Bare Bachel are functioning and provide training in the following trades :

<u>Bastar</u>	<u>Bare Bachel</u>
1. Electrician	1. Electrician
2. Wireman	2. Fitter
3. Fitter	3. Wireman
4. Turner	4. Diesel Mechanic
5. Machinist	5. Stenography
6. Motor Mechanic	
7. Diesel Mechanic	
8. Tractor Mechanic	
9. Welder	
10. Draftsman (Civil)	
11. Stenography	

#### **Adult Education**

The Sixth Five Year Plan included adult education as part of the Minimum Needs Programme aiming at reaching a goal of literacy to all by 1990 as indicated in the New 20 Point Programme. Adult education is a form of non-formal out of school education which caters to the educational needs of people belonging to the age-group 15-35. In Bastar district two Rural Functional Literacy Projects, one at Jagdalpur and the other at Dantewara were functioning having 287 and 296 centres with an enrolment of 8250 and 8570 respectively. Two Nagrik Shiksha Projects having 73 and 96 centres with an enrolment of 1443 and 2561 respectively were functioning at Koilibeda and



Bhanupratappur. In addition ninety eight classes were being run by various agencies with an enrolment of 2583 persons. Thus the total enrolment in 1983-84 was 23407 persons which was about 85 per cent of the capacity created.

Expansion of institutional facilities for the spread of education has been associated with the provision of incentives to children in the form of scholarships and stipends with a view to compensating economic burden on families and attracting more and more children to take advantage of existing educational facilities. Students at the primary level are given all facilities in Ashram Schools. Tribal Welfare Department provides for certain facilities to students such as dress, books etc. Scholarships are provided to students of secondary and higher secondary level.

Hostel facilities have been provided to students of middle and higher secondary schools. Hostel equipment including kitchen equipment and service charges such as water and electricity are borne by the department. Hostel inmates are provided with woolen clothes, blankets and dress. Presently, there are 164 hostels for boys and 12 hostels for girls in the district. Hostel facilities are also provided to colleges. There are five hostels attached to degree colleges.

## **2. Approach and Strategy**

The foregoing overview of the situation in regard to the provision of educational facilities has indicated that adequate infrastructure for the spread of education in the district has been created but peculiar physical and sociocultural constraints present in the district make these facilities inadequate both from the point of view of covering the entire relevant population for compulsory education and for creating of an appropriate value system which may win over the tribals. The general level of awareness remains poor and tribal participation in the development process either as individuals or as community continues to be insignificant. Modernisation of the production

process wherever adopted in the district has eroded self reliance due to technological ignorance and the few fortunate who have been able to acquire proper and adequate services have not displayed any scientific temper. Literacy, no doubt, has increased but it has not strengthened the process of self education among the people.

The aim of development is to create conditions whereby economic growth may be achieved with social justice and a social change may be brought about without doing any violence to communal trust and cooperation. The aim of modernisation of society and the modes of production is not to create new dependencies but to increase self reliance and confidence in human endeavour. Building up of faith in one's own ability and capability and arousing consciousness for community participation in the process of development for the benefit of the community and the area should be the function of education. The objectives of educational development should be integrated with development goals and to create unity in diverse cultural and promotional approaches. The immediate need is to make educational system relevant to developmental needs and to increase employability of the people by extensive development of usable skills in them in the context of development strategy adopted for the area. Therefore effective linkages should be established between education and the development of rural areas, environment, health and industry.

The constitution of the country has laid total emphasis on universalisation of elementary education for children upto the age of 14 years. Efforts in this direction are consciously and continuously being made within financial and physical constraints and already villages having a population of 250 persons have been provided with primary educational institutions. However opening of educational institutions are not enough. They have to be adequately manned by qualified and trained teachers and further an atmosphere has to be created for children to attend them regularly. It is here that extension services are needed to create consciousness among the people to get their children educated. The range of problems facing the

effective spread of elementary education is large and many of them can only be solved after successful implementation of other sectoral programmes. The main problems are the absenteeism of teachers, inadequate training of teachers, lack of functional buildings for educational institutions and residential accommodation for teachers, inaccessibility of the area, partial social acceptance of the form of education being provided to children, and lack of interaction between students and educated community. Education is being conceived in the isolation of a class room while it ought not to be restricted to a formal form of oral impartation of skill or idea.

With a view to arriving at a balanced strategy for educational development with long range objectives of preparing the next generation for the desired social change it has been felt that primary education should be imparted through Ashram Schools where children would live and learn. The atmosphere of Ashram Schools should not be very different from the village and children should be made to participate in activities related to social production. Extension activities and sectoral development programmes should also aim at educating children of Ashram Schools and development functionaries should avail of opportunities to visit Ashram Schools for imparting basic courses and take children to the field for practical demonstration. Agriculture being the main occupation of the area should be taught practically to the inmates of Ashram Schools through modern techniques by suitably adapting them to local conditions. Ashram Schools should combine formal and non-formal modes of learning. Inmates should be made literate, taught numeracy and computational skills, given basic understanding regarding their physical environment without any criticism of their social practices and create in them relevant functional skills capable of enhancing their employ capacity. Inculcation of a sense of dignity in work whether involving physical or mental abilities must be performed with consummate skill so that tribals may not join the growing number of unemployed. Schooling and work should be related at motivational level. To perform this miracle is needed superb and dedicated

community of teachers who have experience and insight or are at least willing to comprehend and develop understanding with regard to the way of life of a tribal.

The problem of absenteeism among teachers are mainly for three reasons, viz., (i) inaccessibility of the area, (ii) non-availability of proper living accommodation and (iii) non-availability of basic facilities to which they are accustomed. In addition, non availability of school building and communication gap owing to the barrier of language are the factors for generating an attitude of non involvement in the work and people. Good teachers are generally not available from within the district and teachers from outside the district are not favourably inclined to stay put in the area. The only course open is to improve the quality of local teachers by means of a well conceived training programme. Frequent refresher courses and proper inspections would be essential for the maintenance of the quality. Such a policy would reduce frequent absences from the place of work and solve the difficulty of language to communicate with the local population. The problems of inaccessibility and residential accommodation would however continue till a massive construction programme of roads, school buildings and residential houses is taken up. The success of educational development programme is dependent to this extent on the development of other sectors. Non-availability of other basic facilities such as safe drinking water, health and medical facilities, electricity etc. are real constraints and their availability is essential for successful educational development. There is an urgent need for providing these basic facilities in the remotest rural area not only to provide facility to the teachers but also to improve the quality of life of the villager in general.

The system of education and course contents need to be adjusted to the need of tribal area. Education in tribal areas has to have a development oriented approach and not simply to build skills of literacy. The tribal has to be convinced that education is going to better his life in his surroundings. To achieve this end methodological

lapses are to be corrected and the involvement of tribal community has to be ensured. Literacy should be considered as an essential input in developing agriculture, improving methods of animal husbandry, bringing attitudinal changes with regard to personal hygiene and creating right responses to general health care and family welfare. Educational system should be geared to meet this challenge by incorporating suitable courses so that illiteracy could be eradicated and the poor could be made capable of bringing their own liberation. Social acceptability of any form of education depends upon what it can do to the society. The relevance of the quality of education being presently imparted to the tribal has to be properly assessed in the context that it is not sufficient to produce qualified tribals for filling a few reserved quota posts but to enhance their capability in the economy as a whole.

Interaction of students with the educated community is of utmost importance. Visitors both officers of the government and general development functionaries of the area should associate themselves with the student community in a meaningful manner. Officers while touring the area and development functionaries while on their regular beat should visit schools and should find time to interact with students. Extension services should particularly make students the target group for bringing change in ideas and attitudes. Students must be told about such small but important things which they themselves could perform for the village with a view to better their surroundings. There is, however, a word of caution: controversial issues particularly those relating to the social life of tribal communities, their habits and their customs should not be criticised nor students should be exhorted to change them. The approach has to be highly imaginative and noncontroversial. It requires some application and research at higher levels. Educated people of villages should be another target group for official interaction. It should always be kept in mind that all their problems cannot be solved immediately and therefore no promises should be made or assurances

given which cannot be made good since a false promise will do more harm than the act of doing little for them. The approach of transferring failure onto other agencies should at all costs be avoided.

Education for girls has to be increasingly made available. Separate Ashram Schools for girls should be established both at the primary and secondary levels. While opening Ashram Schools, care should be taken to take into consideration social customs of concerned tribal communities to be accommodated in plan frame. In some areas dormitories for boys and girls may be had in the same building separately but in other areas separate buildings may be needed. However, important point to be considered is the faith of the tribal in the proposed arrangements. The interaction of girl students of secondary level with lady functionaries of health, medical and social welfare departments must be ensured and they must be made conversant with the methods of child care, health care, general hygiene, and use of ordinary common medicines.

The situational analysis has revealed that institutional facilities for the spread of education at primary and secondary levels have been established to cover the majority population of targetted groups. It is felt that a shift from expanding institutional facilities in general terms to ensuring fuller utilisation of the capacity already created is necessary. It is further felt that literacy skills have also to be associated with creation of functional skills relevant to transforming the economy. The coordination between education department and other development agencies will have to be made more effective to achieve this end. However, immediate need is the qualitative improvement of the facilities created. In this context new educational institutions at primary and secondary levels may not be created unless absolutely necessary but educational institutions for girls should be established. Establishment of Higher Secondary Schools for girls in all development blocks is necessary. The reasons for heavy dropout ratio among the students after the primary level should be assessed and if it is found that distance is the major factor then decision can be taken for establishing more secondary

schools at appropriate places.

The reason for a high dropout ratio may also be the general social environment wherein low literacy proportion in population contributes to the occurrence of this phenomenon. This situation is also responsible for the relapse of illiteracy. There is, therefore, a great need to strengthen and vigorously implement Adult Education Programme, on a larger scale. Special emphasis should be accorded to the education of women and efforts should be made to enlist their larger participation. Arrangements have also to be made to strengthen the post literacy programme for maintaining the literacy levels achieved in case of neoliterates.

### 3. Plan Proposals

Keeping in view the existing position, the approach and the strategy adopted, the following are the plan proposals :

#### School Education

##### 1. Ashram Schools

Universalisation of primary and secondary education according to the spirit of the constitution has to be achieved. In accordance with the approach adopted for this purpose Ashram Schools will be opened hereafter for primary education both for boys and girls and the existing primary schools will be converted into Ashram Schools.

Experience in the field of primary education in the district has suggested a better alternative in the form of Ashram Schools which have high promise to increase regular attendance in schools and check wastage and stagnation to a considerable degree. It has promise to provide an atmosphere for learning.

Ashram Schools would provide board and lodging facilities to children within the school precincts along with class room teaching. In addition students would be given vocational options to learn about improved activities of different production sectors.

It is proposed to convert 150 existing primary schools into Ashram Schools. The process of establishing Ashram Schools would continue in the subsequent Five Year Plans. The proposed programme is to be completed in the Seventh Five Year Plan. These Ashram Schools will be manned by the teachers already working in these institutions. These teachers would, as far as possible, be trained to take up efficiently their responsibilities.

The establishment of Ashram Schools would necessarily require functional buildings which will have to be provided. The cost of building of a Ashram School is estimated to be about 8.00 lakh, which will include the cost of residential quarters of the staff. The total cost of one Ashram School would be about Rs. 13.17 lakh in five years.

## **2. H.S.S. for Girls**

The facility for Higher Secondary level education for girls in the district is extremely poor. Out of 32 blocks in the district only 3 block headquarters have got one girls higher secondary school each. It is proposed to establish one higher secondary school, at the headquarters of each of the remaining 29 blocks. Kanker and Jagdalpur development blocks each has a higher secondary school for girls but looking to the present need, it is proposed to establish two more schools in these blocks. Thus, 31 higher secondary schools for girls are proposed to be established during the Seventh Five Year Plan.

## **3. New Hostels**

Hostel facility for tribal students can play an important role in the expansion of education in tribal areas and may curb the tendency of discontinuance of educational pursuits after the primary level. Students coming out of Ashram Schools would be induced to seek admissions in higher classes if their lodging problems are solved at the place where secondary education is made available to them. Presently there are about 532 Middle Schools functioning in the



district run by Tribal Welfare and Education departments. However, there are only 176 hostels. During the Seventh Plan new Girls Higher Secondary Schools are proposed to be established and these will necessarily require hostel facilities. In urban areas one hostel can serve the need of more than one institution but in rural areas this is hardly possible since more than one middle school at one location would generally not be established. Keeping these facts in view establishment of 250 hostels in the district are proposed for the Seventh Plan period. These hostels will have a capacity of 30 seats each:

#### **4. Additional seats in existing hostels**

Additional seats in the existing hostels have not been provided while most of them were established upto the end of third Five Year Plan period. The number of students at Higher Secondary Level has increased since then and the facility provided so long back is falling short of the demand now. It is proposed to add twenty new hostels of 40 seats each to the existing hostels attached to higher secondary schools in the district.

#### **5, Science Laboratory blocks in Higher Secondary Schools**

Higher Secondary Schools in the district number 57 including three Girls Higher Secondary Schools. Science laboratory facility wherever available in these institutions is poor and 22 institutions run by Tribal Welfare department do not have Science laboratory blocks. Further 16 of the new proposed higher secondary institutions for girls would also require Science laboratory blocks since teaching of science is proposed to be made available in these institutions. The minimum requirement of Science laboratory blocks, thus would be 38 during the Seventh Plan Period. Teaching of science subjects without laboratory facilities is neither feasible nor advisable and therefore it is proposed to establish 10 science laboratory blocks during the first year of the Seventh Plan and 7 laboratory blocks in each year in the remaining period of the plan.

## 6. Buildings for existing educational institutions

Educational institutions managed by Tribal Welfare and Education Departments lack buildings. They are housed in buildings as are available in the villages. Most of the Higher Secondary Schools Ashram Schools, Primary Schools and hostels do not possess their own buildings. With a view to providing these institutions with proper functional buildings it is proposed to construct some 258 buildings including 53 hostels. It may be pointed out that institutional buildings are not being conceived as structures of metropolitan standards but functional and low cost structures which may fulfil the felt need adequately.

## 7. ICDS Scheme

It is now widely conceded that the benefits of economic growth do not automatically reach the poor. It has become therefore obligatory on the part of the state to intervene in the process with a view to correcting this distortion by providing opportunities to the children of the poor, a healthy environment and facilities to develop in the manner other privileged children are developing. Integrated Child Development Services were started with this end in view in 1975 with target beneficiaries being children of 0-6 age group, women of 15-45 age group and pregnant and lactating mothers. The package of services provided to children is supplementary nutrition, immunization against typhus and supplementary nutrition in addition to health and general educational inputs provided to all women of 15-45 age groups.

The aim of ICDS is to lay the foundation for the proper psychological, physical and social development of the child. There is need to further extend the availability of these services to cover a larger number of people. The tribal welfare department is running 8 ICDS projects at 8 development block headquarters. It is proposed to cover all the 32 existing development blocks under ICDS Scheme and hence opening of 24 additional ICDS projects are proposed for the Seventh Plan period.

## Collegiate Education

Most of the colleges in the district have been opened in recent years. Enrolment in these colleges is small but it is likely to improve in the coming years. The hope is based on the strength of sincere efforts and proper approach being envisaged to reduce the proportion of dropouts both at the middle and higher secondary levels thereby creating conditions for better enrolment in colleges. Already, there are 62 Higher Secondary Schools and another 31 Higher Secondary Schools are being proposed to be established during the Seventh Plan. The objective of expanding higher education in the district is to afford opportunity to tribal students for higher education. May be that in the initial stages colleges may remain poorly utilised as far as the strength of students is concerned but the great thing would be that no tribal student who would want to go in for higher education would be denied the opportunity. The existence of colleges in areas where present strength of population and number of lower order educational institutions can support their establishment would act necessarily in furthering the spread of education. It is in this context that the following proposals are made for the Seventh Plan.

### 1. Opening of new colleges

It is proposed to open two arts colleges at Narayanpur and Bijapur. Both these places are headquarters of Integrated Tribal Development Project, Development Block and Tehsil and the respective population of their area is 197074 and 153638. The size of scheduled tribe population is 111687 and 124040 respectively. The number of higher secondary schools existing and proposed, are 66 and 29. The catchment for the proposed colleges appears to be adequate. These places are connected by all weather roads and the hinterland which they serve is intensely tribal wherefrom students would not go to join colleges if these are not easily available in the area. Looking to these situations establishment of these colleges is considered necessary.

### 2. Introduction of Science Subjects

It is proposed to introduce science subjects in colleges at

Bhanupratappur and Dantewara. As has been already pointed out that enrolment in the colleges is poor and the provision of science subjects in these colleges would not appear feasible. However, the need of providing higher education in science subjects emanates from the facts that the district being rich in minerals and forest wealth is at the threshold of major industrial diversification. Already there are proposals for a pulp factory, cement mill, foundry and fabrication establishments, other industries based on forest produce, like tamarind extract, Myrobalan extract, etc. and these would require people having knowledge of chemistry and mineralogy. It may also be pointed out that emphasis in providing employment in these establishments would be on local people and hence preparing local people for the jobs would be an imperative need. Keeping these facts in view this proposal is being made.

### **3. Establishment of Geology Laboratory**

About 30 minerals are found in the district important among them being Dolomite, Lime stone, Bauxite, Marble, Felspar, Sillimanite, Asbestos, Galena, Graphite, Tongston etc. The mineral based industries can play an important part in the economy of the district. It is very essential that contents and qualities of minerals be determined and possibilities of industries to use these minerals as raw material be assessed. In addition it is equally important that facilities for research in minerals be provided in the district, which will not only enhance the knowledge about mineral but will also be helpful in the industrial development. It is, therefore, proposed that a laboratory be established in the Govt. College, Jagdalpur which is teaching Geology upto degree level. The laboratory will serve the researcher as well as provide facilities for postgraduate teaching in Geology without involving extra expenditure.

### **Technical Education**

Infrastructure for technical education created in the district consists of one Engineering College recently established and two Industrial Training Institutes run by Tribal Welfare Department.

With the present level of educational standards the district is not likely to provide enough admissions to the Engineering college nor the college is likely to produce adequate outturn of engineering graduates for the benefit of the district. Yet, the district is likely to generate considerable opportunities for employment involving intermediate technology in mining, energy and industrial sectors. Besides, industrialisation of Chhatisgarh would generate further openings for technically trained boys and girls, and this opportunity must be availed to make the tribal youth of Bastar to seek new world for themselves. The proposals hereinafter made are in the light of the above analysis.

#### Establishment of Polytechnics

There is no polytechnic institution in the district and it is proposed to establish two polytechnics at Kondagaon and Kanker. These institutions are proposed to have the following courses with the number of seats against each of them.

S.No.	Courses	No.of Seats
1	2	3
1.	Civil Engineering with emphasis on water management and lift irrigation	120
2.	Mechanical Engineering with emphasis on Fabrication technology	60
3.	Mining Engineering	60
4.	Civil Engineering with emphasis on Rural Engineering	120
5.	Electrical Engineering including communication engineering	60
6.	Mechanical Engineering with emphasis on maintenance	60
7.	Wood Technology	60

With the opening of the studies of science subjects at higher secondary level there should be, it is expected, no dearth

of students seeking admission in these polytechnics.

## **2. Establishment of new Industrial Training Institutes**

The Tribal Welfare Department is running two Industrial Training Institutes at Bastar and Bare Dachali. Of these two institutes one is located in central parts of the district and the other in the southern parts. The north and the north western parts which are comparatively more open and have registered comparatively more advances do not have the facility of such institutions. One of the peculiar features of the tribal community is the communal insulation and they generally do not move to the areas of other communities. The institutions functioning in the district presently cannot therefore have the advantage of having students from other areas. It is education which can break this insularity and make interaction between different communities possible to a greater degree. It is therefore felt that Industrial Training Institutions may be established in other areas also so that students after being trained may develop inclinations to migrate to any part of the district for employment and in the long run may create more interaction or contact points between different communities. Accordingly four more Industrial Training Institutions are proposed to be established at Narayanpur in the northwest, Sukma in southeast, Dantewara and Bijapur in the south west.

The new Industrial Training Institutes are proposed to have courses of 10 technical trades, viz. (1) Electrician (2) Wireman (3) Fitter, (4) Draftsman (civil) (5) Draftsman (Mechanical) (6) Welding (7) Turner, (8) Radio Mechanic, (9) Electronic Mechanic and (10) Carpentry. The trades of welding and carpentry are proposed to be of one year's duration and the remaining 8 trades of two year's duration. A batch of 16 candidates will be admitted every year in each trade.

## **3. Provision of additional trades in Industrial Training Institute, Bastar.**

It is proposed to open new trades of Radio Mechanic and Electronics in the existing Industrial Training Institute at Bastar.

The existing Trades of fitter and draftsman are proposed to be expanded. The proposed addition will provide additional facilities to 64 trainees in the first year and equal number will be getting training in the second year. The requirements of tools and machinery, buildings and staff for opening the additional trades will have to be fulfilled.

#### **4. Opening of Training cum Production Centres**

The Tribal Welfare Department is running 3 production cum Training Centres, for imparting training to middle pass boys aged 14 years. The training is of one year duration and is imparted in trades like carpentry and tailoring. Four more Training cum Production Centres are proposed to be established during the Seventh Plan with a view to enable more and more tribal youth to be trained and to establish their own units.

#### **Adult Education**

The Sixth plan included adult education as part of the Minimum Needs Programme. The plan envisaged a balanced strategy of educational planning with the long range goals of making available diverse net works of facilities and programmes for education, combining formal and non-formal modes of learning to enable all citizens to acquire literacy, numeracy, computational skills, basic understanding of the surrounding world and functional skills of relevance in daily life and to local environment. Other important objectives envisaged involved development of scientific outlook, sensitization to ethical, social and cultural values which go to make an enlightened people and imparting knowledge, skills and attitudes for enabling better contribution to productive programmes.

The literacy programmes being executed in the State fall in Central and State sectors. The State is required to create, approximately, an equal coverage. The State sector Schemes are Nagrik Shiksha Projects and Adult Education classes run by various voluntary and governmental agencies. A Nagrik Shiksha Project consists of 100

Adult Education Centres and 30 adults are enrolled in one Centre. Teaching and learning material is supplied by the Government. One Nagrik Shiksha Adhikari and three supervisors manage one project. Adult education classes are run on grant-in-aid basis through various voluntary and governmental agencies such as Gram Panchayats, Local Bodies, Gram Sevikas etc. Follow-up and motivation programmes like, (a) Production of literature (b) Rural Libraries and Reading Rooms (c) Kalapathak Mandlies (d) Mobile Cinema Units (e) Community viewing of T.V. etc. are also being implemented.

It is estimated that there will be about 3.70 lakh illiterate would persons in the district and by the end of Sixth Plan nearly 1.2 lakh persons would have been made literate. Nearly 2.40 lakh illiterate persons will have to be taken care of in the Seventh Plan. Keeping in view the goal set in the New 20 Point Programme that cent percent literacy will be achieved by 1990, the following schemes are proposed for the Seventh Plan .

### **1. Rural Functional Literacy Projects**

Two projects are already working in the district and two new projects are proposed in the Plan. These four projects will have the capacity of making 1.80 lakh persons literate during the 5 years.

### **2. Nagrik Shiksha Projects**

Two projects are working at present and 2 more projects are proposed for the Plan. The intake capacity of these projects will be 0.60 lakh students for the Plan period.

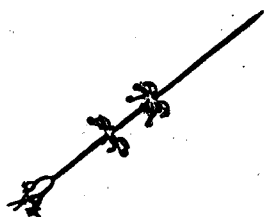
### **3. Adult Education Classes**

Nearly 100 classes are being run by various agencies such as, Gram Panchayats, Local Bodies, N.S.S., N.Y.K., Gram Sevikas, I.C.D.S. etc. It is proposed to continue these classes in the next Plan period. The coverage of these classes will be 15000 persons.



The proposals for education development of the districts as enumerated above would involve about Rs. 55.68 crore, the details of which are given below :

Scheme	Proposed outlay (Rs. in lakh)
1	2
1. Ashram Schools	1690.50
2. Higher Secondary Schools for girls	415.20
3. New Hostels	1218.00
4. Additional seats in existing hostels	133.20
5. Science Laboratory blocks in Higher Secondary Schools	152.00
6. Building for existing educational institutions	706.00
7. Integrated Child Development Service	261.20
8. Opening of new colleges	231.50
9. Introduction of science subjects	95.00
10. Establishment of geology laboratory	5.00
11. Establishment of Polytechnics	80.00
12. Establishment of new Industrial Training Institutes	288.00
13. Provision of Additional Trades in I.T.I.	33.10
14. Opening of training cum production centres	19.50
15. Adult Education	239.55
<b>TOTAL :</b>	<b>5567.75</b>



### Sectoral Plans - a summary

The total size of the development plan for Bastar comes to Rs.494.34 crores. Sectorwise distribution of this allocation and the percentage to the total plan size are shown in the table below :

(Rs. in crores)

Sector	Financial allocation	Percentage
1	2	3
1. Agriculture	22.96	4.64
2. Horticulture	25.14	5.09
3. Veterinary & Animal Husbandry	10.82	2.19
4. Fisheries	2.98	0.60
5. Forest	53.46	10.81
6. Irrigation	103.58	20.95
7. Power	34.88	7.06
8. Cooperation	19.56	3.96
9. Roads	107.47	21.74
10. Industry	14.36	2.91
11. Water supply and sanitation	22.90	4.63
12. Medical and Public Health	20.55	4.16
13. Education	55.68	11.26
<b>Total:</b>	<b>494.34</b>	<b>100.00</b>

# **EMPLOYMENT OUTLOOK**

## EMPLOYMENT OUTLOOK

The plan for development of Bastar as formulated in the preceding pages is expected to generate adequate employment opportunities to the people of the district. The employment opportunities would be both of regular and temporary nature. The estimates of the likely generation of employment opportunities of regular or continuing nature in different sectors are as follows :

<u>Sector</u>	<u>Employment Generation</u> (No. of posts)
Agriculture	751
Horticulture	667
Fisheries	182
Forest	115
Road Development	292
Cooperation	67
Animal Husbandry	1875
Education	615
Medical and Public Health	61
Water Supply and Sanitation	578
	<hr/>
	5203

These employment openings would be created during the implementation period of the plan, i.e. during the five years of its operation. Besides, employment opportunities of non-continuing nature would also be created in the process of creating infrastructure, such as, roads, irrigation works, plantations, laying of transmission lines, construction of water supply projects etc. The estimates of such opportunities according to different sectors are as follows :

<u>Sector</u>	<u>Employment Generation</u> ( '000 mandays)
Agriculture	7300
Horticulture	2111
Fisheries	274
Animal Husbandry	500
Forest	2299
Irrigation	51801
Road Development	58400
Power	9404
Industrial Development	10366
Medical and Public Health	5457
Water Supply	17520
	<hr/>
	165432
	<hr/>

Employment generation of non-continuing nature is estimated to be of the order of more than 16 crore mandays in five years. The actual creation of these employment opportunities per year would depend upon the size of resource investment. However, on an average little more than three crore mandays of employment would be generated per year and assuming 270 working days in a year it will generate a demand for about one hundred twenty two thousand working persons. In other words, the proposed development plan is capable of providing employment to a little more than one hundred thousand workers. The demand for the additional labour force during the operation of the proposed plan would be of the order of one hundred thousand to one hundred twenty five thousand for meeting the total employment demand so generated.

The supply of workers depends on the demographic structure of the population of the area. The strategy adopted is to employ primarily the people of the district. It is, therefore, necessary that the existing demographic structure of the population of the

District should not be permitted to be altered by immigrant labour from outside as far as possible. However, a few skilled and trained immigrants would have to be permitted. The availability of labour force depends upon the size of population in working age group. The latest census data with a distribution of workers according to different age groups is not available. Therefore, the availability of work force during the period of the operation of this plan would have to be based on the proportions obtained in earlier censuses. The population of the district and the proportion of workers to total population according to census 1981 is as follows :

Population			Proportion of					
Persons	Male	Female	Workers			Marginal workers		
			Per- sons	Male	Female	Persons	Male	Female
1	2	3	4	5	6	7	8	9
.1728829	860296	868533	45.26	61.26	29.42	7.14	0.9	13.3
.111620	58417	53203	31.80	49.89	11.96	0.62	0.4	0.9
.1840449	918713	921736	44.45	60.54	28.40	6.74	0.8	12.6

The proportion of workers to total population as obtained in 1981 has been assumed to be prevailing in 1985 and 1990 and based on this assumption the estimates of main workers for 1985 and 1990 are produced below out of the estimated population at these two points in time :

Year	Workers (00)						
	Rural		Urban		Total		
	Male	Female	Male	Female	Male	Female	Total
1990	6198	2985	326	78	6524	3063	9587
1985	5675	2733	298	72	5973	2805	8778

The difference between the number of workers in 1985 and 1990 would provide the additional number of persons who would be available for work during this period. However, this should not be acceptable since the estimate is based on the concept of the worker as adopted in 1981 which included all persons, irrespective of age, who were engaged in any productive activity for the major and minor part of the year. The time differential determined the category of the worker, i.e., main or marginal worker. According to the concept, persons below 15 years were also included in the main or marginal workers. For the purpose of the proposed development plan, persons belonging to ages below 15 years are not to be included as additions to working force since persons of this category would be enrolled as students in elementary classes and therefore would not be available for work. The plan envisages full enrolment of children belonging to age groups of 6-11 and 11-14 years in primary and middle schools. Nevertheless, while not accepting the total additions in the size of workers as relevant for the purpose of realistic estimates of work force as would be available during the plan period it must be noted that female participation in productive economic activities is considerably less contrary to common belief that tribal male lives on the exploits of tribal female and is lazy and unwilling worker. Another point emerges out of the proportions of marginal workers and that is that the proportion of female in the total marginal workers is considerably more than the male marginal workers. The inference can either be that female participation is less on account of lack of opportunities for work in the area or that the nature of work available in the area is not suitable for female workers. The former inference appears to be more reasonable.

The estimates for determining the size of additions during the plan period should then be based on the increase in the population belonging to age groups of 15-59 years, thereby leaving the increased population below 15 years for the educational programmes and the population above 59 years on account of old age although in predominantly rural set up these people too contribute their mite to the economic

activities of the family or the household. However, proportion of population of 15-59 age groups in 1981 census is not available and therefore the proportion as obtained in 1971 census has been adopted to estimate the population in this specific age group which is as given below :

Year	Population aged 15-59 years ('00)								
	Rural			Urban			Total		
	Persons	Male	Female	Persons	Male	Female	Persons	Male	Female
1990	10288	5169	5119	468	265	203	10756	5434	5322
1985	9421	4734	4687	428	242	186	9849	4976	4873

The difference or the increase between 1985 and 1990 is the increase in population belonging to working age and the entire increase can be considered to be available for work except a few persons who might be out of working force in their capacity as students or nonworking housewives or rural elites or persons engaged in nonproductive activities. In the Bastar situation the number of such persons cannot be large and hence any significant reduction in the size of the additions to the working force is not anticipated. Further, and more significantly the participation rate is expected to go up by 1985 as a result of the implementation of programmes of the Sixth Plan and hence the estimated size of work force would be more than estimated now. Possibly, the female participation may also have gone up during this period. Therefore, the total addition to the population aged 15-59 has been taken to be available for work. The size of this increase is 90,700 persons.

The total availability of labour force would comprise the following components of population :

- (a) estimated addition to the working force representing the difference of population of 15-59 age group between 1985 and 1990.



- (b) estimated marginal workers of 15-59 age group at the beginning of the plan period.

The estimated number of marginal workers at the beginning of the plan is as under :

Year	('00)								
	Rural			Urban			Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total
1985	70	1074	1144	2	5	7	72	1079	1151

Thus, the total availability of labour force during the plan period would be :

1.	Addition to population of 15-59 age group between 1985-1990.	90,700
2.	Marginal workers at the beginning of the plan i.e. in 1985	1,11,510
		<u>2,02,210</u>

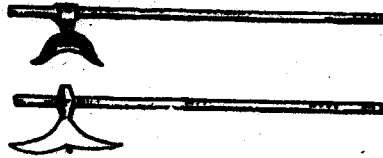
The actual availability of work force would however, depend upon the size of the investment and the work participation rate. The programme contents of the plan are likely to involve the rural population near their habitations and mostly in work which would not be beyond their technical skill. It can, therefore, be assumed that work participation rate would increasingly be higher during the plan period. And, as such, it can be assumed to be about 60 per cent for the persons to be added during this period. The case of marginal workers is slightly different. There is no way of knowing the degree of marginality of their participation in work but it can be assumed that they are available only partially for the additional work. In the absence of any firm basis for measuring the duration of their availability they have been assumed to be engaged in work with half

intensity and as such about half of them would be available for full time work. With these assumptions the availability of the labour force for the plan period is estimated to be about the size of 1,10,175 persons which is in agreement with the demand estimated earlier.

The emphasis, as has been mentioned earlier, is on providing profitable employment to the people of the district. Such a condition naturally imposes two conditions, viz., (i) creation of employment opportunities to absorb the supply of labour force and (ii) creation of work pattern suitable to the skills and technological capabilities of available workers. The first condition is suitably fulfilled as discussed in foregoing paragraphs. The second condition involves the study of the pattern of the quality of the labour force. The distribution of unemployed persons on the live register of Employment Exchange according to the levels of literacy and education shows that a shade more than one-fifth (about 20.5 per cent) of the total currently registered persons at the Exchange belong to illiterate or just about literate category. Another about 21.0 per cent are literate and educated below higher secondary standard. The bulk of the registered unemployed persons comprising about 48.0 per cent belongs to higher secondary level or above but below the graduate level and about 10.0 per cent are graduates and post graduates. The total number of these registered persons was 12,988 on 31st December, 1983 out of which 1613 were females. The number of educated persons with the level of higher secondary and above was 5485. A substantial part of educated persons is liable to find employment during the Sixth Plan with revised educational standards of recruitment for lower level posts within the district and the expectation is that a very few of them would be available as back log in the Seventh Plan. However, registrations at the Employment Exchange, in general, are by no means a reliable indicator of the state of unemployment but it can be safely assumed that educated unemployed would mostly be found registered with the

exchanges as they are mostly available in urban areas. The real number of unemployed and under-employed would be found in rural areas where looking to literacy levels educated persons with these educational standards are not expected to exist in a considerable number. The proposed development plan is expected to generate about 5203 job openings for educated persons in the continuing employment situations in the government and about the same number in non-government institutions in industrial, cooperative, forest and power sectors.

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Sub. National Systems Unit,  
 National Institute of Educational  
 Planning and Administration  
 17-B, SIA Ghaziabad, Marg, New Delhi-110016  
 DOC. No..... S. N. S. - 102 /  
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