EDUCATIONAL DEVELOPMENT IN THE FOURTH PLAN

(1969—74)

Report of the Planning Group on Education

Education Division
PLANNING COMMISSION
New Delhi

September, 1968

EDUCATIONAL DEVELOPMENT IN THE FOURTH PLAN
(1969-74)

Report of
Steering Committee
of
Planning Group on Education

Education Division
Planning Commission
New Delhi

September 1968

FOREWORD

A Planning Group on Education under the Chairmanship of Dr. B.D. Nag Chaudhuri, Member(Science) was set up by the Planning Commission in March, 1968 for undertaking preparatory work of formulating the Fourth Five Year Plan. This Group set up a Steering Committee under the Chairmanship of the Secretary, Union Ministry of Education to put up their proposals. The enclosed Report of the Steering Committee makes an attempt to give a bird's eye-view of the present position in the field of educational developments in the country and in the light of the various points emerging from this review suggests programmes and policies under various sectors of education. There are also self-contained papers on some of the important areas.

2. The Report of the Steering Committee was considered by the overall Planning Group on Education whose recommendations are also included in this document.

3. I have great pleasure in placing before the Planners, Administrators and Research Workers in the field of education the report of the Steering Committee of the Planning Group on Education on : "Educational Development in the Fourth Five Year Plan 1969-74" and the recommendations of the overall Planning Group thereon. These documents are circulated in the hope that they will stimulate discussion on the major issues raised. The Planning Group would welcome observations/ comments which readers may care to send.

(D.P. Nayar)
Senior Specialist(Education)
Planning Commission,
New Delhi.

November, 1968.

TABLE OF CONTENTS

I

REPORT OF THE STEERING COMMITTEE

Section		Paras	Pages
I	INTRODUCTION	1-2	1-2
II	PRESENT POSITION - A REVIEW	3-22	2-10
III	PRIORITIES AND STRATEGIES FOR FOURTH PLAN	23-25	11-13
IV	OUTLAYS AND TARGETS	26-36	14-20
V	PROGRAMMES AND POLICIES	37-59	21-29
	(i) Pre-School Education	37	21
	(ii) Elementary Education	38-40	21-23
	(iii) Secondary Education	41-42	23-24
	(iv) University Education	43	24
	(v) Social Education	44	25
	(vi) Teacher Education ..	45	25
	(vii) National Service and Youth Programmes ..	46	25-26
	viii) National Council of Educational Research and Training ..	47	26
	(ix) Development of Languages ..	48-49	26
	(x) Book Production ..	50	27
	(xi) Cultural Programmes	51	27
	(xii) Vocationalisation of Education ..	52	27
	(xiii) Development of Science Education ..	53-58	28-29
	(xiv) Technical Education	59	29
VI	PLANNING, IMPLEMENTATION AND EVALUATION MACHINERY ..	60-63	30-31

Annexures:

		Pages
I	Extracts from "Approach to the Fourth Plan" as approved by the NDC in their meeting held in May, 1968.	32-33
II	Approach to the Fourth Five Year Plan in Education (Detailed Guidelines to States)	34-41
III	Elementary Education in the Fourth Plan	42-62
IV	Secondary Education in the Fourth Plan	63-72
V	University Education in the Fourth Plan	73-101
VI	Teacher Education in the Fourth Plan	102-116
VII	Social Education in the Fourth Plan	117-131
VIII	National Service Programme, Youth Welfare and Physical Education Programmes in the Fourth Plan	132-137
IX	Educational Administration and Planning in the Fourth Plan	138-142
X	National Council of Educational Research and Training in the Fourth Plan	143-144
XI	Science Education during the Fourth Plan	145-175
XII	Technical Education in the Fourth Plan	176-182
XIII	Central and Centrally Sponsored Sector	183
II	Recommendations of the Planning Group on the Report of the Steering Committee	184-193
III	List of the Members of the Planning Group on Education	194

EDUCATIONAL DEVELOPMENT IN THE FOURTH PLAN -

REPORT OF THE STEERING COMMITTEE

I

INTRODUCTION

The Planning Commission set up an overall Planning Group on Education under the Chairmanship of Dr. B.D. Nagchaudhuri, Member (Science), in March, 1968, for undertaking preparatory work of formulating the Fourth Five Year Plan. The Group was asked to formulate proposals in regard to the size, content and strategies in the various sectors of educational planning. The first meeting of the Planning Group decided to set up a Steering Committee under the Chairmanship of the Union Education Secretary (1) to examine the material already avalable: the Draft Outline of the Fourth Plan, the Report of the Education Commission, the Reports of the various Committees that had discussed the Education Commission Report, etc.; (2) to identify areas in which further work was necessary and specify problems which required further investigation; (3) to prepare guidelines for preparing educational development programmes to be communicated to the State Governments after obtaining the approval of the Planning Commission; and (4) to prepare a tentative draft plan in education for the consideration of the Planning Group on Education. The Steering Committee consisted of the following:-

1. Shri G. K. Chandiramani, (Chairman)
   Secretary,
   Ministry of Education.

2. Dr. O. P. Gautam, (Member)
   Dy. Director General (Education),
   I.C.A.R.

3. Prof. P. K. Doraiswami, "
   Director General,
   Health Services.

4. Dr. P. J. Philip, "
   Secretary,
   University Grants Commission.

5. Dr. A. R. Verma, (Member)
Director,
National Physical Laboratory.

6. Shri J. P. Naik, "
Hony. Adviser,
Ministry of Education.

7. Shri D. P. Nayar, (Secretary)
Senior Specialist (Education),
Planning Commission.

The Committee associated other experts and the officers of the concerned Ministries/Organisations when their subjects were discussed.

2. The Steering Committee held 8 meetings to consider various aspects of educational development. The detailed Guidelines to the State Governments - prepared in the light of the "Approach to the Fourth Plan", approved by the National Development Council (relevant extracts given in Annexure I) - were finalized. These were subsequently sent to the State Governments by the Ministry of Education with the concurrence of the Planning Commission (reference Annexure II). The papers on various aspects of education considered by the Steering Committee, revised in the light of the discussions held, are given as Annexures III to XIII (pages 42-183).

II

PRESENT POSITION - A CRITICAL REVIEW

Expansion of Educational Facilities

3. There has been phenomenal expansion in the facilities for education as summed up in Table 1.

Table 1

Number of students at schools and colleges*

(Figures in lakhs)

Stage and Age-group	1950-51 (Actuals)	1955-56 (Actuals)	1960-61 (Actuals)	1965-66 (Likely Achievement)	1968-69 (Anticipated)
1. 2.	3.	4.	5.	6.	7.
I. Primary (6-11) Classes I-V					
Enrolment	191.5	251.7	349.9	514.5	568.0
Percentage of age-group	43.1	50.0	62.8	78.5	79.2
II. Middle (11-14) Classes VI-VIII					
Enrolment	31.2	42.9	67.1	105.4	130.5
Percentage of a age-group	12.9	15.9	22.5	30.9	34.7
III. Secondary(14-17)** Classes IX-XI					
Enrolment	12.6	19.8	30.2	55.1	64.2
Percentage of age-group	5.6	7.3	11.1	18.0	19.0
IV. University Education** (17-23)					
Enrolment	3.1	5.5	7.4	12.3	16.9
Percentage of age-group	0.8	1.2	1.5	2.3	2.9
V. Technical Education (Admission capacity)					
Diploma (No.)	5900	10480	25000	49900	48000
Degree (No.)	4120	5890	13820	24700	24000

*)
**) Explanatory notes on next page 4.

Educationally less advanced areas

4. This general expansion of educational facilities, however, is not uniformly spread. There are regional imbalances in regard to the overall expansions and in elementary education (age-group 6-14) is concerned the problem is mostly concentrated in the three educationally less developed States of Bihar, Rajasthan and Madhya Pradesh. By 1968-69, they will be accounting for 48 per cent of the non-attending children. This position would be worse than what was in 1960-61 when the non-attending children in these States were 32 per cent of the total non-attending children in India.

Backward sections of the population

5. Educational facilities have not spread uniformly among the various sections of the population. The backward sections of the community such as scheduled castes and scheduled tribes, and population in rural and hilly areas have not availed of all the educational facilities available to them.

---

* There is very great variation in different States in regard to class systems, the age of entry, etc. For purposes of convenience the broad pattern prevailing in the country, has been taken. Primary stage has been taken to mean classes I-V, corresponding to the age-group 6-11, middle stage to mean classes VI-VIII, corresponding to the age-group 11-14, secondary stage to mean classes IX-XI corresponding to the age-group 14-17, and the university stage corresponding to the age-group 17-23. There are a considerable number (about 20% in the case of primary stage) of students who belong to the over-age and under-age groups but it is hoped that as the education system settles down and as children start going to school at the right age, the over-age and under-age children will tend to disappear. The enrolment expressed as percentage of the population of the corresponding age-group is a fair measure of the task accomplished and the task remaining to be done.

** Excludes enrolment in classes XI and XII (in U.P. which are affiliated to U.P. Board. The enrolment in these classes has been included in secondary classes.

Girls' Education

Girls' education has lagged considerably behind that of boys as can be seen from Table 2.

Table 2

Proportion of enrolment of boys and girls (1951-69)

(Percentages)

Year	Classes I-V		Classes VI-VIII		Classes IX-XI		University Stage	
	Boys	Girls	Boys	Girls	Boys	Girls	Boys	Girls
1.	2.	3.	4.	5.	6.	7.	8.	9.
1950-51	71.9	28.1	82.9	17.1	86.8	13.2	88.4	11.6
1965-66 (Provisional)	63.8	36.2	73.2	26.8	77.7	22.3	76.6	23.4
1968-69 (Estimated)	62.8	37.2	70.1	29.9	75.5	24.5	76.0	24.0

Though the gap between the enrolment of boys and girls is narrowing there is still considerable difference between the two.

Adult Literacy

6. The adult illiterates have not been given sufficient attention. The percentage of literates increased from 17 to 24 during 1951-61 and the number of illiterates also increased from 298 million in 1951 to 334 million in 1961. The number of illiterates in the age-group 15-44, however, was 131 million. In 1968-69, it is expected that the number of illiterates in the age-group 15-44 would be about 150 million. Adult education is a crucial sector where all studies have shown that it is possible to get a quick return in economic terms. Its neglect, therefore, has seriously affected the development effort of the country.

Teachers Education

7. The rapid expansion of educational facilities has outstripped the resources of trained teachers, buildings and equipment. As Table 3 below will show, in spite of increasing provision for training of school teachers, the number of untrained teachers has been increasing.

Table 3

School Teachers - Trained and Untrained

(in lakhs)

Year	Teachers	Trained Teachers	Untrained Teachers	Percentage Trained
1.	2.	3.	4.	5.
1950-51	7.50	4.30	3.20	57
1955-56	10.29	6.23	4.06	61
1960-61	13.83	8.95	4.88	65
1967-68	20.47	15.19	5.28	74

In certain subjects, acute shortages have been experienced at the secondary stage. For example, in science and mathematics, the present shortage is estimated at 40% of the requirements. Similarly, technical institutions are short of staff by 30-40 per cent. Shortages are experienced in other stages of education as well. Apart from numbers, the quality of training has considerably deteriorated.

Buildings 8. On the basis of figures collected from States in 1964-65 it was estimated that 50 per cent of the schools at the primary and middle stages had no buildings of their own or were housed in totally unsuitable accommodation. At the secondary level and training institutions, 30 per cent of the existing schools and institutions were in this unsatisfactory state. They estimated the backlog as follows:-

Institutions	Backlog in lakh sq.ft.
Primary and middle schools	4695.0
Secondary Schools	468.0
Primary teacher training institutions	28.0
Secondary teacher training institutions	0.64
Hostels for training institutions	77.0
Total:	5268.64 lakh sq.ft.

Since then the position may have deteriorated further because although new schools continued to be opened during the interregnum 1966-69, the plan provision for expenditure on buildings during these three years was proportionately inadequate. Similarly in technical institutions, although precise data on the above lines is not available, there are indications of shortage of buildings.

Equipment

9. As regards equipment, there is hardly any equipment worth the name in most of the primary and middle schools. At the secondary stage it was estimated in 1964-65 that about 60 to 70% of the secondary schools were without adequate laboratory equipment. As regards universities and colleges, the U.G.C. have repeatedly pointed out the inadequacy of equipment. Even in technical institutions there is shortage of equipment both indigenous and foreign.

Text-books

10. There is dearth of proper textbooks. The National Council of Educational Research and Training is making some efforts in this regard. As regards university textbooks, attempts have been made to produce cheap editions of foreign textbooks with the assistance of USA, U.K., and USSR. Apart from the problem of textbooks there is almost complete absence of children's books. States have tried to meet the problems of textbooks through nationalisation but this is still in an experimental stage. Various difficulties have been encountered, especially in regard to the availability of paper and printing presses. The position in regard to libraries, both institutional as well as public, is very unsatisfactory.

Scholar-ships

11. Expenditure on scholarships, stipends and other financial concessions through Government sources has been rising in recent years. It rose from Rs. 2.75 crores in 1950-51 to Rs. 24.06 crores in 1962-63 and is estimated to increase to Rs. 35 crores by the end of the Third Plan. Of the total enrolment at various stages of education, scholarships holders at the end of the Third Plan are estimated to form 2.8 per cent at the middle stage, 8 per cent at the secondary stage and about 18 per cent at the post-matric stage, including technical education institutions.

Manpower Shortages

12. The educational system is not linked with manpower needs with the result that critical shortages have been experienced during the last three Plans in certain fields such as of professional, technical and related workers, of sales workers, transport and communication workers, craftsmen and production workers etc. These results from imbalances in the educational system.

Science Education

13. There is too little emphasis on science. Due to difficulties of staff and equipment, the quality of science teaching at all stages is not satisfactory. At the elementary stage, including middle, it is practically non-existent. At the secondary stage although general science is said to be available for all students, its standard is extremely low. By 1965-66, the number of students studying science as an elective subject is expected to rise to 20 lakhs out of 55 lakhs of students. At the university stage it is estimated that by 1965-66 as against the original target of 42.5 per cent, only about 39 per cent of the students will be enrolled in science courses.

Vocational Education

14. There is also the imbalance between general and vocational education. In other countries besides there being considerable emphasis on the inculcation of basic skills at the elementary stage, about 40 per cent of the students go to vocational schools at the secondary stage. In India, crafts, nominally introduced in a number of elementary schools, is very badly taught and the resultant educational value is very little. At the secondary stage, by 1965-66, only about 6.5 lakh children would be in vocational schools (including teacher training) corresponding to general secondary schools in which enrolment would be about 55 lakhs. At the post-matric level, enrolment in arts, including commerce and oriental learning courses, accounted for 34.2% of the total enrolment in 1950-51. This has increased to 52.2% in 1962-63. The percentage of students enrolled in science and professional educational courses has on the other hand decreased from 65.8 per cent in 1950-51 to 47.8 per cent in 1962-63.

Educated unemployment

15. This accounts for the increasing numbers of the educated unemployed on the live register of the employment exchanges. In spite of shortages in certain categories as mentioned above, the number of registrants with qualifications of matriculation and above rose from 1.5 lakhs in 1953 to 7.80 lakhs in June, 1963 and to 11.7 lakhs in June, 1968. Although part of this increase is due to the larger awareness of the public about the utility of employment exchanges yet it clearly shows the increase in the number of unemployed educated people. Though the proportion of educated registrants to the total number of registrants is falling but the absolute numbers are rising and pose a serious social and economic problem.

Orientation of the Educational System

16. As a result of the deliberations regarding the orientation of the educational system to the new emerging needs it was decided to convert the elementary schools to the basic pattern, to diversify secondary education and increase its duration so as to make it a terminal course for the large majority of the students and to increase the duration of the university course

from 2 to 3 years for the first degree. As regards basic education, the percentage of basic schools to the total number of elementary schools is estimated to have increased from 15.1 per cent in 1951 to 26.5 per cent in 1965-66. The quality of these schools is extremely varied and the large majority of these schools are not very different of from the ordinary schools. Though 75 per cent of the training institutions will be converted to the basic pattern by 1965-66, the quality of programmes offered in these training institutions and the condition of buildings and equipment available needs considerable improvements.

17. As regards diversification at the secondary education stage, as has already been stated, it hardly exists. Out of the 3700 diversified courses provided in multi-purpose schools, the number of technical, agricultural, commerce, fine arts and domestic science was only 1700 and the other courses were in humanities and sciences. These courses neither give the student sufficient vocational skills as to enable him to settle down in a job nor do they prepare him adequately for university education with the result that the colleges prefer students who have taken up science rather than those who have gone in for diversified courses. The implementation of the other recommendations of the Secondary Education Commission viz. that of increasing the duration of secondary education has been largely confined to the institutions in Madhya Pradesh, West Bengal, Rajasthan, Punjab and Bihar. Taking the country as a whole, the number of higher secondary schools at the end of the Third Plan is expected to be only 5315 out of a total of 22385 high/higher secondary schools or about 24 per cent.

18. At the university stage, the three-year degree course has not been accepted by the State universities of U.P. and the Bombay University. In most other universities also where it has been introduced it has not led to a three year integrated course as was the original intention but only to a combination of 1 + 2.

Wastage in education

19. Even the utilisation of the resources of men and money is not satisfactory as is shown by the fact that considerable wastage takes place all along the line in education. At the primary stage 60% of the students, who enter class I, do not get even permanent literacy because they drop out before reaching class IV. This wastage figure has remained almost steady over the last 10 years. The quality of education imparted also leaves much to be desired. It also appears that there is hardly any impact of this education on agricultural practices and the running of panchayats and cooperatives which are the basic institutions of our national life and for the satisfactory organisation of which, necessary attitudes have to be inculcated at this stage.

20. At the secondary stage and the university stage more than 50 per cent students fail in the public examinations. Again, a majority of the students pass in the third division. In 1962-63, for instance, 71% of B.As., 45% of B.Scs., 50% of M.Sc. passed in the third division. As the prospects of employment for the third divisioners are very limited, as is shown by the recent survey of the pattern of graduates employment carried out by the D.G.E. & T., they add to the number of educated unemployed. In technical institutions a recent survey carried out by the Education Division revealed that the wastage was 25 per cent at the graduate level and 50% at the diploma level.

Financial resources

21. Although expenditure on education increased from 1.2 per cent of the national income in 1950-51 to 2.9 per cent in 1962-63, and the government share of expenditure increased from 56% of the total expenditure in 1951-52 to 68% in 1961-62, the total amounts provided fell far short of the requirements. It is also significant that the percentage of development resources allocated to education have remained practically stationary during the three Plans, being 7.6% in the First Plan, 6.6% in the Second and 7.5% in the Third.

22. The problems have been further accentuated during the three annual plan years of 1966-69. During this period, the outlays for education could not maintain the tempo of developmental activity, which consequently was slowed down, very greatly. In many States, at the elementary stage, it was not possible to appoint an adequate number of additional teachers, with consequent slowing down of expansion of enrolment, overcrowding in existing schools, unemployment of trained teachers and curtailment of training facilities for teachers. Comparatively speaking, expansion of facilities at the secondary stage received greater attention from the State Governments than that of primary education. The expenditure under university education exceeded the original allocations largely due to the setting up of new universities and colleges. No worthwhile programmes were taken up under adult education. The emphasis in technical education has been mostly in consolidation. In view of the prevailing unemployment among engineering personnel, the Central Government has recommended to all States to reduce admissions in engineering colleges and polytechnics. The programmes of mid-day meals at the primary stage were continued at almost the same level as were reached in 1965-66. No significant programmes were taken up for the expansion of girls' education, or the reduction of wastage and stagnation etc. The programmes of qualitative improvement fared even worse and were either eliminated altogether or were maintained at a very low level of effectiveness.

III

PRIORITIES AND STRATEGY FOR FOURTH PLAN

Approach

23. The broad approach to the Fourth Plan has been indicated in the Planning Commission document on the subject and in the detailed guidelines to the States sent by the Ministry of Education with the concurrence of the Planning Commission. Briefly, the main direction of educational development in the Fourth Plan will be to promote social justice, link education effectively with economic development and increase returns from investments made by plugging wastage and improving quality of education.

Priorities

24. It is impossible to lay down precise priorities between different sectors of education as they are mutually dependent. Technical education rests on the base of general education. The various stages of general education support the upper stages and in turn are dependent upon them for teachers and so on. It is, however, possible and necessary to identify the important tasks in each area. That is proposed to be done in this Section. The relative priorities of these tasks will vary from State to State and, even in the State, from district to district.

(a) In elementary education the most important task is the provision of facilities for universal education. This involves three programmes: the provision of facilities to backward areas and backward sections of the community, including girls; the expansion of facilities at the middle level; and the reduction of wastage and stagnation. The last two problems are closely interlinked as they both arise from the discontinuance of education by children, mostly from economic necessity, and the solution to it lies in organising continuation education on a large scale.

(b) The expansion and improvement of science education and its linking with urgent national needs has to be given priority at all levels.

(c) The post-graduate education and research levels in all areas have to be specially looked after as high levels of excellence are needed in every field.

(d) In the case of vocational and professional education, its quality has to be emphasised and quantity adjusted to manpower needs. Close links have to be forged with industry.

(e) High priority has to be given to educational research, reform in curricula and well-designed and carefully conducted pilot projects, duly evaluated, so that advances in new directions can be made with efficiency and economy.

(f) While adult education is highly important both for liquidating illiteracy as well as increasing the productive efficiency of the labour force, it would not be possible to launch on any large scale programme. Emphasis has, therefore, been laid on voluntary agencies and community effort and on the organisation of literacy campaigns as part of the national service programme and in close collaboration with plans for improving agricultural or industrial productivity.

(g) High priority should be given to the identification of talent and encouraging it through a generous system of scholarships. The community must share the increasing burden of educational development through increase in fees.

(h) Adequate training and motivation of teachers is central to educational development.

(i) High priority should be given to the development of part-time and correspondence courses as a means of lateral and vertical mobility of the labour force as well as of social justice so that those who were forced to enter life early due to poverty are able to go up later through their own effort.

Strategy

25. The magnitude and the complexity of the tasks involved in the proposals put forward in this report requires, above all maximum possible involvement of the people and the mobilisation of local and private effort, through appropriate organisational and administrative measures. Further, resources will have to be conserved by maximum utilisation of existing facilities and plugging wastage and stagnation. The planning, implementing and evaluating machinery will have to be streamlined. Fringe activities (in Plan and non-Plan sectors) will have to be wound up. It will have to be ensured that every new scheme is taken up after the most careful consideration and adequate preparation through a stage of pilot projects. Top priority will have to be given to such activities which do not require much finances and have a high multiplier effect. These will need organising skills, technical competence and greater human

effort. All efforts in the Fourth Plan will have to be concentrated on essential and priority schemes. Educational technologies, which promote expansion and development in education with minimum investment without lowering standards, will have to be used in an increasing measure. Educational programmes will need to be dovetailed with various social and economic objectives. This will, among other things, require effective coordination with other departments engaged in similar activities and also the drawing up of a perspective plan on the basis of manpower needs of the economy, social demand, availability or likely availability of financial and human resources.

IV

OUTLAYS AND TARGETS

Outlays

26. In the light of these priorities, the needs of education in various sectors were examined. The sum total of various proposals, which came up before the Steering Committee, was about Rs. 1615 crores. In the light of various suggestions made by the Steering Committee and keeping in view the constraint of resources, the original proposals were revised and the outlays which now emerge, are Rs. 1300 crores. Their break-up is indicated in Table 4. The outlays proposed in the Draft Outline have also been shown in the Table 4 for ready comparison.

Table 4

Outlays in the Fourth Five Year Plan

(Rs. crores)

Sub-head	Draft Outline	Percentage	Proposals before the Steering Committee	Percentage	Recommendations of the Steering Committee	Percentage.
1.	2.	3.	4.	5.	6.	7.
Elementary Education	322.00	26.6	469.00	29.0	330.00	25.4
Secondary Education	243.00	20.1	217.00	13.4	201.00*	15.5
University Education	175.00	14.5	298.00	18.5	255.00*	19.6
Teacher Education	92.00	7.6	145.00	9.0	120.00*	9.2
Social Education	64.00	5.3	45.00	2.8	40.00	3.1
Cultural Programmes	15.00	1.2	21.00	1.3	20.00	1.5
Physical Education	10.50	0.9	61.00	3.8	30.00	2.3
Languages Book Production	17.50	1.4	75.00	4.8	50.00	3.8
Educational Administration	10.00	0.8	25.00	1.6	22.00	1.7
N.C.E.R. & T.	4.50	0.4	26.00	1.6	10.00	0.8
Vocationalisation of Education	-	-	15.00	0.9	4.00	0.3
Others schemes	3.50	0.3	10.00	0.6	5.00	0.4
Technical Education	253.00	20.9	208.00	12.9	213.00	16.4
Total	1210.00	100.0	1615.00	100.0	1300.00	100.0

* Includes proposals relating to Science Education.

Break-up of the Plan outlay into non-recurring and recurring may be seen in Table 5.

Table 5

Component of the outlays in Third and Fourth Plans

(Rs. crores)

Plan	Total	Construction	Equipment (including books)	Total (Non-recurring)	Recurring
1.	2.	3.	4.	5.	6.
Third Plan	560.00	168.00	56.00	224.00	336.00
Fourth Plan	1300.00	300.00	175.00	475.00	825.00

The outlay in the public sector of Rs. 1300 crores indicated above will be supplemented by a contribution of the order of about Rs. 350 crores from non-government sources, of which only about Rs. 240 crores are of a type that is usually reported in educational statistics and consist of income from fees, endowments, contribution from local bodies, etc. Mid-day meals and similar programmes where ad hoc assistance is forthcoming from the community are also not reflected in these estimates. Further, it is estimated that the outlay on education and training programmes of Departments other than Education, during the Fourth Plan would be about Rs. 500 crores.

27. As a result of the outlays, indicated in the above paragraph, the total expenditure on education will go up from Rs. 850 crores in 1968-69 to about Rs. 1576 crores in 1973-74, which will be about 3.86 per cent of the national income as indicated in Table 6.

Table 6

Total Educational Expenditure during the Fourth Five Year Plan - 1969-70 to 1973-74

(Rs. crores)

Year	Total (Government)	Non-Government	Total (Columns 2 + 3)	Educational expenditure as percentage of National Income
1.	2.	3.	4.	5.
1968-69	640.00	210.00	850.00	2.79
1969-70	765.20	224.70	989.90	3.06
1970-71	879.33	240.43	1119.76	3.27
1971-72	994.42	257.26	1251.68	3.45
1972-73	1146.52	275.27	1421.79	3.69
1973-74	1281.66	294.54	1576.20	3.86

28. According to the latest decision of the Planning Secretaries regarding Centrally sponsored schemes and taking into consideration the tasks which will have to be taken up by the Central Government, it has been estimated that out of Rs. 1300 crores, the outlay on Central and Centrally sponsored schemes would be Rs. 334 crores and Rs. 74 crores respectively or the total Central Sector would be of the order of Rs. 408 crores. The outlay in the State Sector would be Rs. 892 crores.

29. The main schemes in the Central sector relate to the development of Central institutions as well as programmes directly executed by or assisted by the National Council of Educational Research and Training and the University Grants Commission. The work of the NCERT largely relates to pilot and experimental projects, production of model books and of proto-type scientific equipments required in schools, research in curriculum, teaching methods, evaluation, etc. The University Grants Commission concentrates on the consolidation and improvement of higher education with special reference to post-graduate and research work.

30. The most important programmes in the Centrally sponsored sector will be the provision of loans for construction of hostels, functional literacy programmes in conjunction with the Agriculture Ministry's programme of intensive development of agriculture in selected areas and Book Production Programmes.

31. The details of the scheme in the Central and Centrally sponsored sector may be seen at Annexure XIII.

Targets

32. The main targets of enrolment, accepted for the Fourth Plan, are indicated in Table 7.

Table 7

Number of students at schools and colleges

State and Age-group	Unit	1950-51 (Actuals)	1960-61 (Actuals)	1965-66 (Actuals)	1968-69 (Likely Position	1973-74 (targets)
1.	2.	3.	4.	5.	6.	7.
I. Primary(6-11) Classes I-V:						
Enrolment	Lakhs	191.5	349.9	514.5	568.0	748.0
Percentage of the age-group		43.1	62.8	78.5	79.2	92.3
II. Middle(11-14) Classes VI-VIII:						
Enrolment	Lakhs	31.2	67.1	105.4	130.5	201.1
Percentage of the age-group		12.9	22.5	30.9	34.7	45.9
III. Secondary(14-17) Classes IX-XI:						
Enrolment	Lakhs	12.6	30.2	55.1	64.2	97.2
Percentage of the age-group		5.6	11.1	18.0	19.0	24.6
IV. University Education (17-23)(Arts,Science & Commerce)						
Enrolment	Lakhs	3.1	7.4	12.3	16.9	26.3
Percentage of the age-group		0.8	1.5	2.3	2.9	3.8
V. Technical Education (Admission capacity)						
Diploma	Nos.	5900	2500	49900*	48000	26000@
Degree	Nos.	4120	13820	24700*	24000	17000@

@ The targets have been reduced in view of the unemployment among engineers. These will be revised once the demand for the Fifth Plan is known. * Sanctioned capacity.

The progressive increase in enrolment during the various Plan periods is indicated in Table 8.

Table 8

Increase in enrolment in various stages of education during various Plans

(Figures in lakhs)

Sl. No.	Stage/ Age-group	Additional enrolment					Average Annual Increase				
		I Plan	II Plan	III Plan	1966-69 Plan	IV Plan	I Plan	II Plan	III Plan	1966-69 Plan	IV Plan
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.
1.	Primary 6-11	60.2	98.2	164.5	53.5	180.0	12.04	19.64	32.90	17.83	36.00
2.	Middle 11-14	11.7	24.2	38.3	25.1	70.0	2.34	4.84	7.66	8.37	14.00
3.	Secondary 14-17	7.2	10.4	24.9	9.1	33.0	1.44	2.08	4.98	3.03	6.60
4.	University 17-23	2.4	1.9	4.9	4.6	9.4	0.48	0.38	0.98	1.53	1.88

It will be seen that the tempo of increase will comparatively slow down so far as the age-group 6-11 is concerned as we approach the saturation point. The increase at the middle stage will be more pronounced as a result of the pressure of increase at the primary stage in the earlier period, the greater retention as a result of the measures proposed to reduce wastage and stagnation and emphasis on continuation classes. The most phenomenal increase, however, will be at the university stage because of the rapid increase in the social demand and the non-availability of sufficient alternative avenues.

33. The requirements of teachers for the programmes of expansion, is indicated in Table 9.

Table 9

Additional Employment of Teachers

(Figures in lakhs)

Stage	1968-69	1973-74	1969-74 Additional teachers (Columns 3-2)	1969-74@ Additional teachers for normal repacement	Total Additional teachers (Columns 4+5)
1.	2.	3.	4.	5.	6.
Primary	14.20	16.60	2.40	2.30	4.70
Middle	5.20	6.00*	0.80	0.90	1.70
Secondary	2.90	3.90	1.00	0.60	1.60
Totals	22.30	26.50	4.20	3.80	8.00

@ 3 per cent for Elementary Education and 4 per cent for Secondary Education.

* Excludes teachers who will be required for 10 lakhs students to be enrolled in continuation classes. The existing teachers will be required to teach these students.

Thus during the Fourth Plan, the number of additional teachers who will be employed, is expected to be 8 lakhs.

34. The additional number of university and college teachers who are expected to be appointed during the Fourth Plan is likely to be 51,000 inclusive of 5,000 on account of normal replacement.

35. On the basis of expansion visualised for teacher training facilities, the additional number of teacher - educators is likely to be about 3,000 inclusive of replacement. The additional administrative, insepctorate and supervisory staff required during the Fourth Plan is likely to be of the order of about 5,000. It is difficult to make any very precise assessment of the requirements of non-teaching staff. It is estimated very roughly that during the Fourth Plan, about 80,000 to 90,000 additional non-teaching staff will be required.

36. The details of the various important programmes and policies have been given in Annexures III to XII.

In the following paragraphs some of the significant developments visualised have been indicated. The enrolment targets for elementary education have been fixed on the basis of feasibility and the need to achieve the Constitutional Directive as early as possible and those for the subsequent stages on the basis of estimated social demand. In regard to technical education, the admission capacity is proposed to be reduced keeping in view the rough demand estimates, which is all that is possible to make at this stage without the targets of industrial production etc. for the Fifth Plan being known.

V

PROGRAMMES AND POLICIES

Pre-School Education

37. Due to the dearth of resources, the main emphasis in the Fourth Plan in the field of pre-school education, will be on the training of teachers in pre-primary training institutions with attached experimental nursery schools, providing grant-in-aid on a limited scale to municipalities and corporations for setting up pre-primary schools in slum areas and organising low-cost pre-primary classes in rural areas with community support.

Elementary education

38. The provision of universal education for all children upto the age of 14 years would be achieved latest by 1990-91; and the provision for the universal education for all children in the age-group 6-11 would be completed by 1980-81. This will be achieved: (a) by opening new schools in school-less habitations, (b) by encouraging the enrolment of girls and children of backward communities, and (c) by progressively eliminating wastage and stagnation.

39. About 5 per cent of the rural population do not have facilities for primary education. Therefore, in the Fourth Plan, priority will be given to opening primary schools in about 16,000 rural habitations which have a population of 300 and above, but have no school, at present, within a distance of one mile. Like-wise, in the opening of new middle schools, preference will be given to the school-less rural habitations with a population of 1500 and above. Simultaneously vigorous efforts will be made to encourage a larger enrolment of girls, particularly at the middle stage. At the primary stage, the enrolment of girls is highly unsatisfactory in the States, of Bihar, Madhya Pradesh and Rajasthan. At the middle stage, the position is very unsatisfactory not only in these three States but also in Uttar Pradesh. It is proposed to eliminate wastage and stagnation over the next 15 to 20 years according to a phased programme. This will be done through greater integration of work in the school and among the parents, especially in classes I and II and in regard to the care of the pre-school child; through more effective control of admissions in class I so that all the children join the class about the same time, through the provision of mid-day meals; through such programmes as free text books and free clothing to needy children; and through effective teaching. To begin with, in the Fourth Plan, a definite target will be laid for the reduction of wastage and stagnation by 25 per cent of the present incidence and vigorous efforts will be made to achieve it. In regard to qualitative improvements, special attention will be given to the revision of curricula, production of better text-books and the improvement of teaching of science, particularly at the middle stage.

40. According to the programmes drawn up, the targets of expansion for elementary education, are shown in Table 10.

Table 10

Enrolment targets for elementary stage

(enrolment figures in lakhs)

Class/ Age-group	1960-61 actuals	1965-66 actuals	1968-69 anticipated	1973-74 proposed
1.	2.	3.	4	5.
I-V(6-11)				
Boys	235.93	328.38	356.77	446.51
Girls	114.01	186.14	211.19	301.45
Total	349.94	514.52	567.96	747.96
VI-VIII(11-14)				
Boys	50 74	77.18	91.43	136.19
Girls	16.31	28.18	39.02	64.84
Total	67 05	105.36	130.45	201.13
I-VIII(6-14)				
Boys	286.67	405.56	448.20	582.70
Girls	130.32	214.32	250.28	366.29
Total	416.99	619.88	698.41	948.99
%age of population in the age-group				
I-V(6-11)				
Boys	82.9	98.5	97.1	106.7
Girls	41.3	57.7	60.3	76.8
Total	62.8	78.5	79.2	92.3
VI-VIII(11-14)				
Boys	33.2	44.5	47.9	60.6
Girls	11.3	16.9	21.1	30.4
Total	22.5	30.9	34.7	45.9
I-VIII(6-14)				
Boys	66.4	79.8	80.0	91.2
Girls	32.0	43.6	46 4	60.7
Total	49.0	62.0	63.6	76.4

The additional children who will be enrolled in Classes I-VIII, during the Fourth Plan would be 250 lakhs as against 213 lakhs in the Third Plan. Thus, by 1973-74, the provision of schooling facilities would be available for 76.4 per cent of the children in the age-group 6-14; schooling facilities for boys would be available for 91.2 per cent and for girls 60.7 per cent.

Secondary education

41. The enrolment at the secondary stage has shown the highest rate of growth in the field of general education. In the Fourth Plan, it is expected to enrol 33 lakhs additional children in classes IX-XI. The position about expansion of facilities at the secondary stage is indicated in Table 11.

Table 11

Enrolment at the Secondary Stage

Year	Enrolment (Figures in lakhs)			Percentage of the Age-Group		
	Boys	Girls	Total	Boys	Girls	Total
1.	2.	3.	4.	5.	6.	7.
1960-61	24.6	5.6	30.2	17.5	4.2	11.1
1965-66	42.8	12.3	55.1	27.3	8.2	18.0
1968-69	48.5	15.7	64.2	28.2	9.5	19.0
1973-74	71.0	26.2	97.2	35.2	13.5	24.6

It will be observed that, by the end of the Fourth Plan, schooling facilities according to proposed programmes wouldbe available for 24.6 per cent of children in the age-group 14-17; 35.2 per cent for boys and 13.5 per cent for girls.

42. While making, adequate provision for the inescapable growth in enrolment, the main effort in the Fourth Plan will be to enrich the content and improve the quality of secondary education. This will be achieved by a strict enforcement of grant-in-aid rules for the recognition of new schools whose location will be determined according to the requirements of each area, taking into consideration the optimum utilisation of the facilities already available in the area. At the same time encouragement will be given to the setting up of secondary schools in the backward areas and special facilities will be provided for increasing the enrolment of girls at this stage. Scholarships will be offered to bright students from rural areas to enable them to complete secondary education. The present improvement programmes relating to the revision of curricula, production of good text-books and examination reform will be strengthened further. Emphasis will be placed on the pre-service and in-service training of science and mathematics

teachers and the provision of at least the minimum laboratory equipment so as to ensure that every secondary school in the country is able to teach science as a compulsory subject upto Class X. A beginning will also be made in the vocationalisation of secondary education by reorienting and strengthening the teaching of practical subjects in schools which have, at present, facilities for teaching these subjects so as to provide terminal courses for those who will not go beyond the Matriculation stage. ITIs are already providing such courses for some students. By and large vocationalisation will be at the post-Matric stage and will be mostly imparted in institutions for the training of para-medical personnel, agricultural schools, ITIs, polytechnics etc., whose intake will be determined by the need for such personnel. But there is considerable room for further experimentation.

University education

43. Taking into consideration the inevitable expansion, it is estimated that the total enrolment in arts, science and commerce courses including the P.U.C. and the Intermediate classes of Bombay University(but excluding U.P. Intermediate Colleges which are regarded by the State Government as a part of the school system) will increase from 16.93 lakhs in 1968-69 to 26.28 lakhs in 1973-74 indicating an additional enrolment of 9.35 lakhs. The additional enrolment in pre-university, and intermediate, under-graduate and post-graduate and research classes would be 2.76 lakhs, 27,000 , 5 33 lakhs and 99,000 respectively. The additional enrolment in law during the Fourth Plan is estimated to be 35,000. Emphasis will be laid on the development of post-graduate studies and research by expanding the existing centres of Advanced Study and establishing clusters of such centres of Advanced Study in a few universities for inter-disciplinary research in selected subjects. Science education will receive the highest priority. More than 50 per cent of the allocations are reserved for this purpose. It will be expanded and improved through the provision of laboratories, scientific equipment and qualified staff. Provision has also been made for new universities, the establishment of which has already been agreed to. Special assistance will be made available to about 100 selected colleges for improvement. The affiliated colleges have been hitherto completely neglected even though they provide education to more than 88 per cent of the enrolment at the university stage. It is proposed to organise at least 850 summer institutes during the Fourth Plan, with an enrolment of about 40,000 teachers. A number of student welfare services like improvement of hostel facilities, student study homes, health services, sports and games etc. will be taken up. Residential facilities, for students and teachers will be further expanded. The existing schemes of National Scholarships will be expanded in the Fourth Plan. The emphasis will be on loan rather than grant scholarships.

Social education

44. Provision for functional literacy both in rural and urban areas for clearly identifiable groups and compact areas, where intensive programmes of increasing production are launched or where the public response is very good, will be given high priority. Further, educational institutions, through the programme of National Social Service and the village adoption scheme, will take up the programme of initial literacy. These programmes can be successful if there is adequate follow-up in terms of reading materials and libraries. Necessary provisions for this have been made. Voluntary organisations have an important contribution to make in promoting adult education programmes. They will be assisted. The University Departments of Adult Education will be helped in taking up pilot projects, conducting research and organising extension and extra-mural lectures.

Teacher education

45. The main emphasis in this sector will have to be on qualitative programmes like the provision of in-service education, professional education of teacher educators, improvement of existing facilities, provision of correspondence courses for the existing untrained teachers, educational research, up-grading the academic qualifications of the existing unqualified teachers, taking up specialised courses and setting up of State Boards of Teacher Education. Expansion of training facilities will be related by the State Governments to the demand for new teachers and the existing training capacity. Special emphasis will be laid on the training of science and mathematics teachers.

National Service and Youth Programmes

46. The national service and sports programme which has now been accepted as an integral part of educational development, will be implemented during 1968-69 on a pilot basis by the universities and colleges. During the Fourth Plan it is proposed to progressively increase the coverage of students under this programme from one lakh in 1968-69 to 6 lakhs in 1973-74. The coverage of students under the NCC in 1973-74 would be 4 lakhs. So the coverage of the two programmes taken together will be 10 lakhs against a total estimated enrolment of 12 lakhs in the first two years of the degree-course by the end of the Fourth Plan. A number of welfare programmes for urban and rural youth will be taken up and an attempt made to provide a number of activities, through educational institutions, to non-student youth. Physical education and sports programme will be continued. The Ministry of Education have

set up a Study Group which is preparing details of youth welfare programmes. The programmes of Planning Forums will be expanded in the Fourth Plan.

National Council of Educational Research and Training

47. The programmes initiated by the NCERT in the field of evaluation and guidance, curriculum construction, extension, educational research etc. will be consolidated. The programmes of development of science education will be expanded. It is proposed to effect closer collaboration between the programmes of the NCERT, the State Departments of Education, State Institutes of Education, Universities and the other institutions which are concerned with qualitative improvement of education in the country.

Development of Languages

48. The Official Languages(Amendment) Act, 1967 and the Government Resolution thereon enjoin upon the Government of India to prepare and implement a comprehensive programme for the spread of Hindi as well as other modern Indian languages mentioned in the Constitution.

49. A number of schemes for the development of languages have been proposed in the Fourth Plan. These include the setting up of Institutes of Languages, with the objectives of conducting inter-linguistic research, training of translators in different languages and production of literature in Hindi and other Indian Languages including tribal languages. It is also proposed to assist the State Governments in the production of literature in Indian languages so as to facilitate the change over to regional languages as media of instruction at the university stage. The programmes of the Scientific and Technical Terminology Commission will be stepped up. The Central Government will also continue to assist the /Training Hindi Teachers/Colleges and the appointment of Hindi Teachers in non-Hindi States. Assistance will be provided to the voluntary organisations for the propogation and development of Hindi. It is also proposed to set up an institution of university level with Hindi medium in South India. The schemes for the development of Sanskrit like improvement of pay scales of Sanskrit teachers, award of scholarships for Sanskrit studies, etc. will be continued and further expanded. Grants will be given to voluntary organisations devoted to the production of Sanskrit literature.

-/-

Book Production

50. With the decision to switch over to modern Indian languages as the media of education at the university stage, it has become necessary to develop two important programmes viz. (i) the production of books in modern Indian languages with a view to their adoption as media of instruction at the university stage and (ii) the production of indigenous books in English with a view to reducing our dependence on imported books to the minimum. These programmes will be taken up by the Central Government in collaboration with the University Grants Commission and State Governments. At the school stage, intensive efforts will be made (a) to improve the quality of text-books, (b) to produce ancillary teaching and learning materials on an adequate scale, and (c) to make proper arrangements for the distribution and sale of school text books. It is also proposed to suggest to the State Governments to set up autonomous book production corporations. The coordinating machinery for taking up the big programme of book production both at the Centre and State levels, will be established. Emphasis will also be placed on production of books for children, especially from the point of view of national integration and development of interest in science.

Cultural Programmes

51. The programmes of Archaeology, Academics and Museums will be stepped up. Central assistance will continue to be made available for the reorganisation and development of museums run by State Governments and private organisations on the advice of the Central Advisory Board of Museums. It is also proposed to expand the museums run by the Central Government, i.e., National Museum, Delhi, Safdarjang Museum, Hyderabad and Victoria Memorial Hall, Calcutta, etc. There is provision for the expansion of National Library, Calcutta, Delhi Public Library and the National Archives of India. The cultural and Budhistic institutions will be developed. It is proposed to make available to school and college students plaster casts and paintings of museum and archaeological objects and film strips depicting places of historical interest etc. The work relating to the compliation of the Indian and the District Gazetteers will be continued.

Vocationalisation of Education

52. Details of the programme are being worked out.

Development of Science education

53. Science, being basic to the development of a modernising society, has been given a very high priority in the proposals for various levels of education. The proposals are brought together in this section so that they can be viewed as a whole and the relationship of the efforts at various levels made clear. The effort in the Fourth Plan will be to provide facilities for the teaching of science as an integral part of the general education programme at least up to the high schools stage. With this end in view, programmes of pre-service and in-service training of teachers will be strengthened , the curriculum in science will be up-graded and modernised and necessary physical facilities of laboratory and equipment will be made available to as many schools as possible. The agencies which provide leadership role at the State level will be strengthened and a net-work of supervisory agencies will be set up to ensure proper implementation of the science programmes. In addition, encouragement will be provided for information activities through science clubs and science fairs.

54. At the elementary stage, the development programmes include provision of laboratory, facilities to all existing teacher training institutions, provision of science kits to 21,000 selected primary schools, provision of in-service training facilities to teachers of selected schools and a pilot project in each State to improve science teaching through a mobile laboratory-cum-training van.

55. At the middle stage, it is proposed to establish about 150 science teaching centres in selected science colleges, to provide in-service training facilities for 40,000 science and mathematics teachers now teaching these subjects and to provide a science study-room and equip-ment for each of the 20,000 selected middle schools.

56. At the secondary stage, the State Institutes of Science Education will be strengthened, science units will be set up in the State Directorates of Education and Science Supervisors will be appointed in 150 districts. Existing training colleges will be provided science equipment, one-year pre-service training centres for science teachers will be set up in selected universities and a large in-service training programmes will be undertaken. Funds have also been provided for laboratory rooms and equipment in 8,000 existing secondary schools and 4,000 new secondary schools to be set up during the Fourth Plan and in about 500 higher secondary schools of the 12-year pattern. Provision is also made for grants to Science Clubs. Science Fairs at all levels and for the establishment of State Science Museums.

57. At the University stage, there has been a rapid expansion of science education during the past two decades. The enrolment in science subjects which was about 27 per cent of the total enrolment in arts, science and commerce subjects in 1960-61 rose to about 39 per cent in 1968-69. In the Fourth Plan, it is proposed to expand and diversify science education so as to meet the growing demand of science graduates and post-graduates in various disciplines. It is proposed to lay particular emphasis on the expansion and improvement of facilities at the post-graduate and research levels. For this purpose, the Centres of Advanced Study set up in various universities will be strengthened. Inter-disciplinary and intra-disciplinary research will be encouraged through the setting up of 'clusters' of Advanced Centres in related subjects. It is proposed to provide suitable short-term training courses in applied science subjects for science graduates who fail to get absorbed in vocations requiring the knowledge of science courses pursued by them. It is proposed to improve science education facilities by developing selected institutions and selected courses of study, organisation of summer institutes, refresher courses and college development programmes, and development of instrumentation workshops and computer facilities in universities and collegiate institutions.

58. The total provision in respect of scheme exclusively for the expansion and improvement of science education in the Fourth Plan is Rs. 117.50 crores out of a Plan outlay of Rs. 255 crores for higher education. This is in addition to the outlays provided for schemes like hostels and staff quarters, etc., which are common to both science and humanities courses. The provision exclusively for science education at the elementary and secondary stages is Rs. 22.50 crores and Rs. 41.41 crores, respectively, thus making a total provision of Rs. 181.41 crores for science education at all stages. This is exclusive of the provision for science courses in Technical Institutions. Out of this about Rs. 20 crores is for training of teachers, mostly for elementary and secondary teachers.

Technical Education

59. It is proposed to bring down the admission capacity of degree and diploma from 24,000 and 48,000 respectively to about 17,000 and 26,000 in the light of the anticipated demand for engineers and diploma holders, during the Fifth Plan. These figures will be revised as soon as firm figures of demand are available. Main emphasis in this field will be to concentrate resources and energy on improving quality and standards. The improvement programme would relate to pre-service and in-service training of teachers, reorganisation of diploma courses in order to diversify them and reorientate them functionally to the needs of industry, expansion and improvement of post-graduate engineering studies and research, curriculum development and preparation for instructional material including laboratory equipment, expansion of apprenticeship training in industry, etc.

VI

PLANNING, IMPLEMENTATION AND EVALUATION MACHINERY

60. To put through the programmes indicated in the previous sections, and even to improve returns from the existing programmes, it is of the utmost importance that the administrative machinery should be stream-lined. This will require a careful evaluation of the present strength of the cadres of the Central and State Governments, their recruitment and training policies and the incentives provided to personnel at various levels and the provision of remedial measures. Special attention is needed to reduce the work-load to inspectors so that effective supervision can be broadened and modernised to include professional guidance to teachers. It would be desirable to broad-base the area of recruitment of educational administrators both at the Centre and State levels so that people working in universities and similar institutions can be drawn upon the administrative jobs and people in the administrative wing can go to teaching jobs for a few years to enable cross-fertilisation of ideas so that administrative practices and needs of educational institutions can be kept close together. Besides, strengthening the administrative and inspectorate staff, it would be desirable to arrange for their training and retraining. For junior administrative personnel, training programmes could be arranged at the State level, but for senior administrators, it is proposed to set up a National Staff College for Educational Administrators which would, besides providing training programmes through seminars and workshops, also undertake research in problems relating to comparative studies of various procedures and practices in the different States and in other countries with similar problems as our own, so that lessons can be learnt from relevant experience.

61. A careful review of procedures will also be necessary so that through decentralisation of the decision making authority quick decisions can be taken at the appropriate levels right along the lines down to the institutional levels. The administrative machinery, in order to be able to cope with developmental tasks, has to develop the capacity to change and grow in response to the call of new programmes and policies. For that programmes and policies have to be periodically reviewed and modified in the light of evaluation. That would require a carefully designed and strong planning and a statistical cell to assist the Director of Education. This Cell could keep the procedures and the practices of the administrative machinery at all levels under constant review.

62. Planning is a continuous process. Therefore, in the Fourth Plan itself steps should be taken to streamline the planning machinery and in the first instance to make it effective at least at the district level though the attempt should be to take it right down to the institutional level.

63. In view of the importance of this subject, a Working Party on Educational Planning, Administration and Evaluation was set up by the Planning Commission. Report of the Working Party has since been received and it is proposed to implement the programmes suggested by the Working Party in the Fourth Plan.

PLANNING COMMISSION
(Education Division)
...

Annexure I: Annexure I

Extracts from "Approach to the Fourth Plan" as approved by the National Development Council in their meeting held on May 1-4, 1968.

EDUCATION

Immediate attention must be paid to implementation of the directives in the Constitution regarding primary education. The implementation will require provision of special facilities to backward areas and backward sections of the community and for the education of girls. The extent of wastage and stagnation in primary education is at present proving very costly. It would be necessary to devise measures to reduce this substantially. In the field of adult literacy, it is proposed to emphasise the functional approach.

2. Since education is the main instrument of social change, opportunities for secondary and higher education must become increasingly available to all classes. At the same time, restraint of resources - financial and personnel emphasises the need to economise in, and to rationalise the process of institutional spread and to make strenuous efforts at maintaining minimum standards of quality.

3. Considerations arising out of man-power planning have special relevance to the field of technical, vocational and professional education. The institutional and other facilities brought into existence to provide this education must be related to estimates of future demand for trained manpower. This is because the educational effort in this field is relatively costly and excessive supply wastes national resources and because over-supply of highly qualified technicians leads to special difficulties in the case of unemployment. The estimates of future demand can only be made on the basis of a commitment to a certain pattern of long-term development. Further, industry, business and commerce need also to be closely associated with this sphere of educational effort.

4. Enlargement of research activity is essential. All such activity should be coordinated fully between the institutions and universities specially with post-graduate work and that in its applied aspects, it is closely linked with the appropriate sectors of economic activity.

5. The relatively early stage at which a large majority of students in India find it necessary to leave educational institutions and the requirements of a changing technology indicate the importance of providing facilities of part-time education, correspondence courses and other training programmes. These should be so designed as to facilitate lateral and vertical mobility of members of the working force.

6. Because of our poverty, it is not possible for the State to maintain free a system of wide-sprea and varied educational services. While, it is necessary to provide special facilities for the poor, it is not financially desirable to afford free facilities to those who can afford to pay for education of their children. Therefore, a system in which an appropriate charge for educational service is made, combined with a scheme of scholarships, freeships and loans apprears, the most appropriate. It is also desirable to encourage voluntary contributions for educational activity, especially in relation to non-recurrent and capital expenditure, from the community and individuals.

7. While programmes for the expansion of facilities at different stages will have to continue it is essential to lay greater emphasis on programmes of qualitative improvement, Among these, special attention will have to be given to the improvement of the skills and status of teachers, indigenous book production and promotion of student welfare.

8. Another step is the extension of public services which raise the standard of living of the mass of the people. The two most important directions in which this has happened significantly during the last 15 years have been the spread of educational and public health facilities. Education is the most effective means for progress. An appropriate spread of educational opportunities is an extremely important instrument of social policy. It is noteworthy that backwardness in economic organisation and cooperative effort usually goes hand in hand with backwardness in education. (Chapter VIII: Development and Distribution; para 4).

9. It is possible to incur expenditure on specialised programmes, such as school meals, nutritional programmes in favour of definite areas or categories of people and programmes for the welfare of children. If these are properly articulated, they may benefit specially the handicapped classes and categories. Subsidies have been given in the past through the lowering of foodgrain prices. It is obvious that we cannot afford general subsidies at any significant level and further that subsidisation, which is necessarily non-discriminatory, achieves social purposes at too great a cost (Chapter VIII; Development and Distribution; Para 5).

PLANNING COMMISSION
(Education Division)

...

Annexure II

APPROACH TO THE FOURTH FIVE YEAR PLAN IN EDUCATION - DETAILED GUIDE LINES INDICATED TO THE STATES BY THE MINISTRY OF EDUCATION VIDE THEIR LETTER NO.F3-33/68 DATED 8.6.1968

Education is the most effective means for progress. An appropriate spread of educational opportunities is an extremely important instrument of social policy. Side by side, it is also essential to lay greater emphasis on programmes of qualitative improvement. Among these, special attention will have to be given to the improvement of the skills and status of teachers, indigenous book production and promotion of student welfare.

II. Equalization of Educational Opportunities

2. Primary Education: Immediate attention should be paid to the implementation of the Directive contained in Article 45 of the Constitution. This will require provision of special facilities to backward areas and backward sections of the community and for the education of girls. The extent of wastage and stagnation in primary schools is at present proving very costly and it will be necessary to devise measures to reduce it substantially. If possible, programmes such as school meals may be provided in favour of definite areas or categories of children.

3. Secondary and Higher Education: Since education is the main instrument of social change, opportunities for secondary and higher education must become increasingly available to all classes. At the same time, restraint of resources - financial and personnel - emphasise the need to economise in and to rationalise the process of institutional spread and to make strenous efforts at maintaining minimum standards of quality.

4. Professional, Technical and Vocational Education: Considerations arising out of man-power planning have special relevance to the field of technical, vocational and professional education. The institutional and other facilities brought into existence to provide this education should be linked to estimates of future demands for trained manpower. Subject to this, suitable facilities for vocational education should be provided for those who step off the stream of general education during or after the primary stage and the vocationalisation of secondary education needs emphasis.

5. Post-graduate Education and Research: Post-graduate education, carefully linked to manpower needs and research, should receive emphasis. In this context, the development of advanced centres of study in individual or a n of related areas depending on the potentiality of a university, has a special relevance. Emphasis is also needed on the development of inter-disciplinary and intra-disciplinary research which calls for close cooperation between all categories of universities and other research institutions. Applied research should be closely linked with appropriate sectors of economic activity.

6. Adult Education: Adult education, centering largely on functional literacy, may be conceived of in two stages. The first stage may be in the form of a mass movement, largely dependent on mobilisation of local resources, both of personnel and finances. Students and teachers should be an important asset in this movement, wherein popular leadership would be provided by voluntary organisations and the Panchayats. The second stage should include a regular and systematic education of those who are indentified at the first stage as being capable of putting in serious efforts. This will need a paid teacher on a part-time basis and a proper library of suitable follow-up literature. The entire programme should be financed jointly by the State and the local community.

7. Programmes of adult education may be developed in industrial and commercial undertakings, public and private, and by voluntary organisations. They should also form an important part of the programme of national or social service for students. All departments of Government should participate in the programme in a suitable manner, the technical guidance being provided by the Education Department. A State Board of Adult Education may be set up to coordinate these different programmes.

8. Part-time Education: The relatively early stage at which a large majority of students in India find it necessary to leave educational institutions, and the requirements of a changing technology, indicate the importance of providing facilities of part-time education, correspondence courses and other training programmes. These should be so designed as to facilitate lateral and vertical mobility of members of the working force.

9. Planning and Establishment of New Institutions: Preference should be given to the full utilisation of facilities in an existing institution over the creation of a new one. It is also necessary to ensure that each educational institution reaches an optimum size which will help to make it both economic and efficient.

10. On the basis of the Second Education Survey, the location of new primary and secondary schools should be carefully planned. Similar Planning is also necessary for colleges. No new university should be created unless the need for it is clearly established, adequate r ces are provided and the concurrence of the University Commission, Ministry of Education and the Planning Commission is obtained. A convention should also be established that university centres should be set up in the first instance and developed into universities in due course.

III. Programmes of Consolidation and Qualitative Improvement.

11. While programmes of inescapable expansion will continue in the Fourth Plan on the broad lines indicated above, emphasis has now to be shifted to those of consolidation and qualitative improvement.

12. Teacher Education and Teachers Status: Suitable steps should be taken to improve the remuneration, retirement benefits and conditions of work and service of teachers.

13. Special emphasis should be given to the employment of women teachers with a view to increasing the enrolment of girls.

14. Teacher Education - both pre-service and in-service - needs special attention. A State Board of Teacher Education should be set up in each State to formulate and implement comprehensive plans for the development of teacher education. The programmes to be developed for the purpose should include, amongst others, (a) an expansion of facilities to clear the backlog of untrained teachers and to increase the output of training institutions to equal the annual demand; (b) the improvement of training institutions; (c) revision and vitalising of training courses; (d) advanced training of teacher-educators; and (e) the starting of part-time and correspondence courses to supplement those for full-time education.

15. Physical Facilities in Educational Institutions: Steps have to be taken to improve physical facilities e.g. buildings, libraries, laboratories, workshops, playgrounds, school farms, etc. in educational institutions at all levels. Norms should be prepared for prescribing minimum facilities required for each type of institution and attempts should be made to raise as many institutions as possible to this level.

16. The problem of school buildings is urgent. Special efforts should be made to adopt the cheap designs prepared by the Central Building Research Institute, Roorkee and to reduce the cost to the minimum by use of local materials and adoption of pre-fabricated techniques. Provision should also be made for clean drinking water and adequate sanitary facilities in each institution.

17. The assistance of the local community should be fully enlisted for the construction and maintenance of school buildings and improvement of other physical facilities.

18. Student Services: The development of student services and close teacher-student contacts needs emphasis at all stages and especially in higher education. Special attention needs to be paid for supply of text-books. Adequate text-book libraries should be set up in all institutions of secondary and higher education.

19. Development of Talent: Talent should be encouraged through the liberal scheme of scholarships, freeships and other incentives.

20. Improvement of Curricula, Teaching Methods and Evaluation: These programmes need to be developed on a priority basis especially as the finances involved are not large and their multiplier effect is considerable.

21. Curricula need to be revised and upgraded at all stages. Pilot projects should be developed for introduction of work-experience and national or social service and generalised in the light of experience gained. Emphasis need to be placed on the cultivation of social and moral values.

22. The methods of teaching and evaluation should be improved through training institutions, programmes of in-service education for teachers, improved supervision and supply of improved teaching and learning materials. The instruments of mass media should be fully utilised for this purpose.

23. Book Production: Programmes of book production - text-books and other teaching and learning materials - need great emphasis.

24. The State Governments should make full use of the programme of text-books and teaching materials prepared by the NCERT. They should also consider the desirability of establishing autonomous corporations, functioning on commercial lines, for the production and distribution of textbooks.

25. The development of regional languages should be accelerated with a view to enabling their speedy adoption as media of education at the university stage. A programme of preparing text-books and other reference material needed for this purpose should be developed intensively and quickly.

26. Programmes of producing text-books and other reference material in higher education will also be developed at the national level, the object being to produce as early as possible most of the books required at the under-graduate stage and a fair proportion of those required at the post-graduate stage within the country itself.

27. Science Education: Science Education should be improved through pre-service and in-service training of science teachers and adequate supplies of laboratory equipment and other teaching materials and aids.

28. Physical Education and Sports and Games: Emphasis should be placed on the development of programmes of physical education and games and sports at all stages. The existing training facilities for physical education instructors and coaches should be reviewed and wherever necessary, expanded and strengthened. Special encouragement should be given to indigenous games. Programmes of scouts and guides, youth hostels, etc. should be strengthened and developed further.

29. Pattern of School and College Classes: To the extent resources permit, steps should be taken to adopt the pattern of 10 + 2 + 3 recommended by the Education Commission.

IV. Technical Education

30. As pointed out earlier, expansion of technical education may be related to future manpower needs. Where future manpower estimates indicate the need for reduction, that reduction should be affected largely in institutions which have not been able to provide facilities of the standard laid down by the All India Council for Technical Education.

31. In the Fourth Plan, accent should be on programmes of qualitative improvement and consolidation. There should be closer cooperation between technical education and industry and commerce. Priority should be attached to the qualitative improvement of post-graduate education, carefully adjusted to manpower needs, and research, especially as increasing sophistication will make larger demands for high quality design and research engineers. Part-time and

sandwich courses may be established in industrial complexes, whenever new facilities have to be created. Correspondence courses may also be developed on a pilot basis, in the first instance, to assist employed personnel to upgrade themselves. These non-formal courses would assist horizontal and vertical mobility of technically trained personnel as also to train persons for self-employment.

32. The requirements of development indicate that the technical performance of the small-scale dispersed units must be at a high level and that they should absorb the fruits of technological advances to a significant extent in all important directions and provide opportunities of self-employment for technically trained persons. For this purpose, it may be necessary to provide short-term courses in management, sales and accountancy to technically qualified persons.

33. Highest importance should be given to the pre-service and in-service training of technical teachers and providing them with opportunities for professional advancement. The in-service training should include summer institutes, sequential courses, organised field experience particularly in industry and advanced studies and research for those teachers whose academic qualifications need to be improved.

34. The Technical Teachers Training should reorganize their programmes to cater primarily for teachers sponsored by technical institutions. Special attention should be given by the Institutes to equipping technical teachers with pedagogical skills and techniques.

35. Polytechnics should designedly be brought into close relationship with industry to conduct cooperative programmes of training for technicians in selected and diversified fields like automobile engineering, refrigeration and air-conditioning, radio and electronics, machine tool technology, instrument technology and chemicals manufacture in relation to regional requirements.

36. Research programmes should be organised and conducted by the Institutes of Technology and other well-established institutions which have adequate expert personnel, with special reference to curriculum development, preparation of text-books, teachers' guides and instructional materials. The Institute of Technology should increasingly take interest in helping the engineering institutions in conducting in-service training programmes and developing a new methodology of technical education.

V. Cultural Programmes

37. Emphasis should be laid on consolidating the continuing programmes of archaeology, museums academies and other cultural projects. Special attention should be paid to those schemes which bring out the composite character of Indian culture. Museums, archaeological sites, etc. should be fully utilised for educational purposes and guides prepared to assist teachers for this purpose.

VI. Educational Planning Administration and Finance.

38. The machinery for planning and administration should be streamlined.

39. There should be an effective planning cell in the Directorate of Education. The different institutions created for qualitative improvement of education, namely, the State Institute of Education, Institute of Science Education, etc., may be brought to-gether as an effective technical arm of the Directorate of Education communicating with the NCERT on the one hand and the district level set-up on the other.

40. The district should be adopted as the principal unit for planning, administration and development of education. The staff at the district level should be accordingly strengthened. The programmes of 'School-complexes' may be adopted and the system of institutional planning introduced.

41. The supervisory machinery should be strengthened and subject-specialists may be appointed, especially in science and mathematics.

42. It is essential to streamline administrative and financial procedures and to decentralise authority to take decisions. The recruitment policies should be revised, wherever necessary, to attract competent persons and adequate provision should be made to pre-service and in-service training of educational administrators and supervisors.

43. All important programmes should be subjected to rigorous evaluation from time to time and a suitable agency should be created for the purpose.

44. It is not possible for the State, on account of limitations of available resources, to maintain a system of widerspread and free educational services. While it is necessary to provide special facilities for the poor, it is not financially desirable to offer free facilities to those who can afford to pay for the education of their children. Therefore a system in which an appropriate charge for educational services is made, combined with a scheme of scholarships, freeships and loans appears to be most appropriate.

45. Institutional facilities like buildings and equipment should be fully utilised for educational and community activities. Wherever possible and necessary, shift-system should be adopted. It is also desirable that facilities like workshops, laboratories, play-grounds, etc. should be shared jointly by a number of institutions, wherever possible. Efforts should be made to produce, within the educational institutions themselves, as much of educational equipment as possible.

46. In view of the emphasis on self-reliance and the need to reduce foreign aid, utmost emphasis should be laid on the indigenous production of scientific instruments. Towards this end, institutions should be assisted and encouraged to experiment and design new instruments, especially those now being imported.

47. It is desirable to encourage voluntary contributions for educational activity, especially in relation to non-recurrent and capital expenditure, from the community and individuals.

ANNEXURE III

PLANNING COMMISSION
(Education Division)

...

ELEMENTARY EDUCATION IN THE FOURTH PLAN

Pre-Primary Education

Pre-primary education is important for the physical, mental and emotional development of children. The need for pre-primary education is particularly great in the case of children from slum areas or from poor families whose home environment is unsatisfactory. Children who attend pre-primary classes show better results at the primary stage, the incidence of wastage and stagnation being comparatively lower in their cases. Every encouragement should, therefore, be given in the Fourth Plan to voluntary organisations to expand facilities for pre-primary education, particularly in the rural areas. On account of the constraint of resources, Government's role will be limited to the following programmes which may be included in the Plan:-

(a) Setting up in each State at least one institute with an attached model nursery school for organising training of teachers, production of literature and experimentation:

(b) Opening a limited number of schools in slum areas;

(c) Providing grant-in-aid on a limited scale to municipalities and corporations for setting up pre-primary schools in industrial areas for children of workers; and

(d) Organising low-cost pre-school classes in rural areas with community support.

An ad hoc provision of Rs. 2.00 crore is made for these programmes of which Rs.1.00 crore is shown under "Teacher Training Sector" and Rs. 1.00 crore under the "Elementary Education Sector".

Elementary Education - The Main Objectives

2. The programmes in the elementary education sector have been drawn keeping in view the following broad objectives:-

(a) By the end of the Fourth Plan the facilities for primary education (classes I-IV/V) should be spread all over the country so that no child may have to walk more than one mile to attend the nearest primary school. As for the middle stage (classes V/VI-VII/VIII), steps should be taken to expand facilities during the Fourth and Fifth Plans, in such a manner that by the end of the Fifth Plan, a middle school should be within a walking distance of three miles of every pupil in the country. The Second Educational Survey will provide guidance in regard to the location of new schools.

(b) The Constitutional directive regarding provision of universal education for all children upto the age of 14 years should be achieved latest by 1990-91 and the provision for the universal education for all children in the age-group 6-11 should be completed by 1980-81. Since conditions vary widely, each State will have to work out its own perspective plan of elementary education and decide upon the enrolment targets for the Fourth Plan keeping in view this long-term perspective. In fact, it will be useful to prepare a perspective plan for each district.

(c) Wastage and stagnation should be eliminated in the next 15 to 20 years according to a phased programme. In the Fourth Plan, a definite target of reduction of wastage and stagnation, by say 25% of the present incidence, should be laid down and vigorous efforts made to achieve it.

(d) A core programme for raising the standard of elementary education should be implemented in the Fourth Plan. This will include; the revision and upgrading of curriculum, the preparation of better textbooks, the provision of minimum physical facilities, the improvement of facilities for the teaching of science and the introduction of work experience.

(e) Salaries and conditions of service of teachers should be improved. The facilities for pre-service training of teachers should be adequate in number and quality. The proportion of untrained teachers should be

progressively reduced. The facilities for in-service training should be expanded and opportunities and incentives should be provided to teachers to improve their academic and professional qualifications.

Location of new schools

3. As stated already, the target in the Fourth Plan is to provide a primary school (classes I-IV/V) within easy reach of every child. The Second Educational Survey reveals that only about 5% of the rural population do not have facilities for primary education. The Survey indentified about 16,000 habitations with population of 300 and above which are not served by the existing primary schools. During the Fourth Plan, the highest priority should be given to the opening of primary schools in these and groups of other habitations which have a total population of 300 and above. In regard to middle school education (classes IV/V - VII/VIII), the Survey shows that in 1965-66, 82.95% of the rural population living in 7,12,894 habitations had the necessary facilities i.e. children in these habitations did not have to walk more than three miles to attend middle classes. According to the Survey, about 4,000 to 5,000 habitations with population 1,500 and above were not served by the existing middle schools. In locating new middle schools during the Fourth and Fifth Plans, preference should be given to these habitations, and groups of other habitations with a total population of 1,500 and above. With the help of the Survey, a district-wise programme of opening new schools during the Fourth Plan should be prepared keeping in view the targets indicated in para 2(a).

Targets of additional enrolments

4. It has been stated that each State should work out the additional numbers of pupils which it must enrol during the Fourth Plan in order to achieve the targets indicated in paragraph 2(b) above. In the case of the age-group 6-11, the minimum effort which the country would need to make is to enrol about 180 lakh additional pupils in classes I-V during the Fourth Plan so as to raise the overall percentage of enrolment in that age-group from about 79.2 in 1968-69 to about 92.2 in 1973-74. Since additional enrolment in classes VI-VIII during the Fourth Plan will depend on the number enrolled in the lower classes and the transfer ratio from these classes, it has been estimated that it will be feasible to enrol 60 lakh additional pupils in these classes. In addition, it is proposed to enrol about 10 lakh more pupils through the provision of part-time education. If these targets are realised the percentage of enrolment in the age group 11-14 will rise from 34.7 in 1968-69 to 45.9 at the end of the Fourth Plan. The details may be seen in Statements I & II

Cost of additional enrolment

5. (i) It has been assumed that the average annual salary of a trained matriculate teacher during the Fourth Plan will be Rs.2,000/- and that of a trained graduate Rs.3,000/-. It has also been assumed that the new teachers appointed in primary classes (I-IV/V) during the Plan period will be mostly trained matriculates. In the middle classes, about one-fourth of the total number of teachers recruited during the Fourth Plan will be trained graduates, as against 17% graduate teachers at this stage during 1965-66.

(ii) The teacher-pupil ratio in primary classes is about 1: 40 at present. It will be extremly difficult to find the necessary financial resources to enrol 180 lakh additional pupils and maintain the present teacher-pupil ratio. It would, therefore, be advisable to introduce in the primary classes the double shift system, at least in classes I & II. Since the effective teaching time in these classes does not exceed 2½ to 3 hours, one teacher should be able to teach the two classes under the double shift arrangement. This will make it possible to increase the teacher-pupil ratio to 1 :45. In the middle classes, the teacher-pupil ratio assumed in this paper is 1 : 30, against the present ratio of 1 : 25.

(iii) Working on these assumptions the average annual cost per pupil in respect of teacher emoluments, provident fund contribution and other benefits works out to Rs. 49/- at the primary stage and Rs. 82.5 at the middle stage. To this may be added another 10% to cover the non-teacher costs, such as salaries of class IV servants, contigencies etc. The total per pupil direct cost will thus be Rs. 54 at the primary stage and Rs. 90.75 at the middle stage. The cost of part-time education has been assumed at 50% of the cost in regular full-time classes i.e. Rs.45 per pupil per annum. With the proposed increase in the teacher-pupil ratio, existing teachers should be able to teach 70 lakh additional children, in classes I-V and 26 lakh additional children in classes VI-VIII. Thus provision for teachers, accommodation etc. has to be made for expansion of facilities for 110 lakh additional children in classes I-V and 44 lakh additional children in classes VI-VIII (including 10 lakh children through part-time education). The total cost during the Fourth Plan for the two stages will come to about Rs. 178.20 crore and Rs.106.06 crore respectively. Assuming further that the cost to Government will be 85% of the total direct expenditure at the primary stage.

and 80% at the middle stage, the provisions required in the Fourth Plan for expansion of facilities at the two stages will be Rs. 151.30 crore and Rs.84.85 crore respectively.

6. (i) In addition to the programme outlined in the foregoing paragraph regarding expansion of facilities for education at the primary and middle stages, it is proposed to give the school system responsibility for imparting functional literacy to all persons in the age-group 11-17, who have either missed primary education or were unable to complete it. It is felt that part-time education from an hour to an hour and a half every day given over a period of one year should suffice to make persons in this age group functionally literate. These classes will be held in the existing primary and middle school buildings outside the normal school hours. A teacher of the school will be given an allowance of about Rs.25/- p.m. to conduct the literacy class. Taking the average attendance as 15 per class the cost of making one person functionally literate will be about Rs.20/- per year. Ultimately, this system should be effectively linked with the regular school system and it should be possible for a young man to pass his various examinations through this part-time study.

(ii) The Kothari Commission estimated that about 200 lakh persons in the age-group 11-13 alone could be brought under this programme. However, in view of the constraint of resources and the need for building up the programme on a sound basis it might be more prudent to keep a target of enrolment of 50 lakh pupils during the Fourth Plan. The cost will amount to Rs.10 crore.

Assistance to backward States

7. A major proportion of additional enrolments will take place in some of the backward States like Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh. It is feared that these States will not be in a position to meet the expenditure from the State resources and the Central assistance which they may reasobably expect to receive according to the prevailing pattern. It will, therefore, be necessary to give special central grants to these States over and above the State Plan ceilings. This special Central assistance should generally be subject to the condition that the grantee States make adequate contributions from their Plan and non-Plan resources to the funds needed for expansion of facilities for primary education.

Special programmes for girls

8. Since the major problem in achieving universal enrolment is to enrol large number of girls, it will be necessary in most of the States to undertake special programmes to encourage enrolment of girls. These programmes include: special enrolment drives through publicity and propaganda, provision of girls' hostel and quarters for women teachers, provision of stipends for girls, appointment of school mothers, construction of separate sanitary blocks for girls in mixed schools, provision of attendance allowance for teachers etc. It is proposed to provide Rs. 20.00 crore for these programmes.

School meals and free text-books

9. The provision of free school meals and supply of free text-books is necessary in the case of poor children, particularly those living in backward areas. About 1 crore children are, at present, supplied mid-day meals in schools. The food-stuffs for this purpose are being made available largely by CARE and other foreign agencies. It is proposed to increase the coverage of this programme by 50 lakh children, thus covering roughly 20% of the pupils enrolled in classes I-V at the end of the Fourth Plan. Various suggestions regarding the form which this programme may take in the Fourth Plan are under discussion. However, assuming the annual cost of feeding and administrative charges for one child as Rs.20/- and Rs.5/- respectively, the total cost of extending the benefit of the school meals programme to 50 lakh additional pupils in the Fourth Plan will amount to about Rs.37.5 crore. phased programme of supply of free text-books to 15% of the elementary school pupils, numbering over 9 crore at the end of the Fourth Plan, at an average cost of Rs. 3/- per annum will cost about Rs. 12.50 crore.

A programme of this magnitude can be organised only with the voluntary contribution of the community, the Government support being limited to about 25% of the expenditure i.e. about Rs.10.00 crore for school meals and about Rs.3.00 crore for free text-books. The percentage of State assistance will vary in inverse proportion to the prosperity of an area.

:stage and :tagnation

11. The incidence of wastage and stagnation is about 60% in the primary classes. The incidence is particularly high in classes I and II. Various studies have been made from time to time and valuable suggestions have been made by the Kothari Commission to eliminate this evil. It is proposed to lay down a definite target for the reduction of wastage and stagnation say 25% - during the Fourth Plan. It will be necessary to create administrative cells at the Centre and in the States to direct and coordinate efforts to achieve this objective. A sum of Rs. 1 crore is provided for this purpose.

)ualitative mprove- ients:

12. (a) Strengthening State Institutes of Education - To cope with the programmes of revision and upgrading of curriculum, preparation of text-books, general reading materials, teachers' hand-books and audio-visual aids and introduction of improved evaluation techniques, the State Institutes of Education will be strengthened. It is proposed to provide a sum of Rs. 1.5 lakh per year for 20 State Institutes for their development activities. The total cost during the Fourth Plan will be Rs.1.50 crore.

(b) Buildings and equipment - There is an acute shortage of accommodation in primary and middle schools. Apart from the heavy backlog, the new enrolment of about 110 lakh children in classes I-V will require the construction of about 2,45,000 additional rooms and provision of simple equipment. It is proposed that the responsibility for providing buildings and equipment may be placed mainly on the village communities, the contribution of Government being limited to about Rs. 600/- per class-room, which will be roughly 25% of the cost. The cost to Government will amount to about Rs. 14.70 crore. Similarly, against about 1,00,000 additional class-rooms required for middle classes, it is suggested that government assistance may be provided at the rate of Rs.1,200/- per room - Rs. 1,000/- for the class room and Rs. 200/- for equipment. The cost will amount to Rs. 12.00 crore.

(c) Introduction of work experience - An ad hoc sum of Rs. 5 crore will be provided for (i) research and experimentation, (ii) training courses for teachers, (iii) publication of teachers' guide-books, (iv) purchase of equipment etc. The emphasis will be on making effective use of facilities already existing in basic and other schools.

Development of Science Education

13. There are about 4,72,000 primary sections, Considering this large number, the emphasis during the Fourth Plan period should be on developing competencies of the primary school teachers for handling improved programmes of science. A selected number of schools may be equipped to develop experimental programmes and gather experience before large scale programmes are implemented.

(i) Strengthening of existing 1,400 teacher training schools with laboratory and workshop equipment - There are at present about 1,400 teacher training schools preparing teachers for primary schools. There are no laboratory facilities in these schools. It is proposed that in the pre-service training the content of science and its methodology should be included as an integral part of the course for all primary school teachers. To achieve this, each training school has to be adequately provided with science and workshop equipment so that competencies of demonstration and improvising science equipment may be developed in future primary school teachers. A provision of Rs. 1.40 crores is proposed for this purpose at the rate of Rs. 10,000/- for each training school.

(ii) Provision of science kits to 21,000 primary schools - It is proposed to provide science equipment kits to 21,000 primary schools (60 primary schools per educational district) at the rate of Rs. 200/- per kit. This will enable these schools to teach the new courses of general science more effectively. The total cost of this programme will be Rs. 42 lakhs.

(iii) In-service training of 21,000 primary school teachers of selected schools - With a view to enable selected primary teachers to teach new courses of general science, the teachers of 21,000 primary schools (which are proposed for the supply of science kits) will be trained through a two month in-service programme in 700 selected neighbourhood higher secondary schools/ training schools. The total cost of this programme will be Rs. 41.3 lakh.

(iv) Provision of mobile laboratory-cum-training vans - As a pilot project to improve science teaching at the primary stage and provide in-service training to a large number of teachers through well-trained staff, it is proposed to provide 20 State Institutes of Science Education with a mobile van unit fitted with a projector, a small laboratory and a library. Important topics of the syllabus will be taught by the staff of these mobile units in selected primary schools, where teachers of the neighbourhood primary schools will observe and discuss

the teaching. Each van will be provided with a trained science graduate, an under-graduate and driver-cum-projectionist. The total cost of this programme will be Rs. 17 lakhs.

Middle Stage

(v) Establishing 150 science training centres in selected science colleges - The Kothari Commission had recommended that science at the middle stage should be taught as individual disciplines of physics, chemistry and biology in place of the existing courses of general science. In order to achieve this, each middle school with a single section would need at least two science and mathematics teachers competent to teach modern courses of physics, mathematics, chemistry and biology. To train such teachers, it is proposed to run a new two year course for matriculates who will be trained as science and mathematics teachers for middle classes. 150 such training centres are proposed to be opened. The yearly intake of each centre will be 80. The non-recurring expenditure on buildings, hostel facilities and equipment is estimated at Rs. 5 lakh per centre. The training cost is estimated at Rs. 600 per trainee. Each trainee will be paid a stipend of Rs. 500 per year. These centres will prepare candidates for a course leading to diploma in science education to be awarded by the universities. The course will consist of content, methodology and practical work. The cost of this programme will be Rs. 7.50 crore non-recurring. The recurring cost of the phased programme will be Rs. 9.24 crores.

(vi) In-service training programme for existing teachers of science and mathematics working in middle schools - There are at present about 90,000 middle schools where science is taught as an integrated course of general science. In order to train the existing teachers of these schools to teach science courses as individual disciplines of physics, chemistry, mathematics and biology, a two-month in-service training course will be organised through selected teacher training colleges. During the plan period about 40,000 teachers at the rate of two teachers each from a middle school will be trained to handle the new courses in science and mathematics. The cost of this phased programme will be Rs. 80 lakhs.

(iii) Provision of a science study-room and equipment for senior elementary schools - In order to have desired effect through a programme of science teaching, it is necessary for children to have first-hand experiences of science. To achieve this, it is proposed that 20,000 selected middle schools may be assisted to build a science study-room and equipment it fully for showing demonstrations and doing some individual pupils' laboratory work. A sum of Rs. 5,000 per school as building grant on a matching basis and another Rs. 5,000 for purchase of furniture, shortage facility and equipment is proposed. The cost of this programme will be Rs. 2 crores (non-recurring).

Incentive payments to teachers

14. Elementary teachers who improve their academic and professional qualifications will be given incentive payments. Teachers at this stage will be encouraged to pass the matriculation or higher academic examinations and/or take their professional training through regular, short-term or correspondence courses. An ad hoc provision of Rs. 5.00 crore is made for this purpose. General increase in salary scales of existing teachers will be met from non-Plan resources. It may also be mentioned that the question of expanding and improving both pre-service and in-service training of teachers has been dealt with in a separate note.

15. Regular supervision and guidance are necessary to improve the quality of instruction in primary and middle schools. The general question of improving the quality of inspection etc. has been discussed in a separate note. Here it is necessary to state that in view of the large expansion envisaged in the Fourth Plan, it will be necessary to appoint additional inspecting staff. At present the expenditure on inspection and direction forms about 4% of the total direct cost on education. Assuming the same proportion of expenditure during the Fourth Plan, the cost of additional staff for the inspectorate will be about Rs. 9.40 crore.

Conclusion

16. Statement III gives the details of the outlay required for elementary education in the Fourth Plan in order to achieve the targets suggested in the present note. The total provision for elementary education excluding that for pre-service and in-service training of teachers, adds upto about Rs. 330 crore. It may be

pointed out that the outlay suggested for this sector in the Draft Outline of the Fourth Five Year Plan (1966-71) was Rs. 322 crore. Since then salary scales of the teachers have been revised upwards in all the States leading to a steep rise in the per capita cost of education in an elementary school. Therefore, there is no scope, whatsoever, for further reduction in the allocation for elementary education, suggested in this paper.

Statement I

Enrolment position in 1968-69 and targets for 1973-74
Classes I-V

(Population and Enrolment figures in lakhs)

Name of the State	1968-69								
	Boys			Girls			Total		
	Population	Enrolment	3 as % age of 2	Population	Enrolment	6 as % age of 5	Population	Enrolment	9 as % age of 8.
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
1. Andhra Pradesh	27.11	22.76	84.0	26.47	16.00	60.4	53.58	38.76	72.3
2. Assam	11.10	10.31	92.9	11.04	6.34	57.4	22.14	16.65	75.2
3. Bihar@	39.29	33.08	84.4	38.41	11.33	29.5	77.61	44.41	57.2
4. Gujarat	18.50	22.08	119.4	17.33	12.88	74.3	35.83	34.96	97.6
5. Haryana@	7.17	6.03	84.1	6.45	2.47	38.3	13.62	8.50	62.4
6. Jammu & Kashmir	2.60	2.84	109.2	2.44	1.31	53.7	5.04	4.15	82.3
7. Kerala	13.83	17.16	124.1	13.13	14.04	106.9	26.96	31.20	115.7
8. Madhya Pradesh@	28.25	23.13	81.9	27.21	9.85	36.2	55.46	32.98	59.5
9. Madras£	23.77	28.00	117.8	22.91	20.82	90.9	46.68	48.82	104.5
10. Maharashtra@	32.81	35.25	107.4	31.64	24.54	77.5	64.45	59.79	92.8

@ Information received in response to Selected Physical Targets letter.
£ The figure of total enrolment received in response to 'Selected Physical Target letter. The break-up of the total figure between boys and girls is estimated.

Annexure I (contd.)

Enrolment position in 1968-69 and targets for 1973-74 -
Classes I-V

Name of the State	1973-74								
	Boys			Girls			Total		
	Population	Enrolment	12 as %age of 11	Population	Enrolment	15 as %age of 14	Population	Enrolment	18 as %age of 17
	11	12	13	14	15	16	17	18	19
1. Andhra Pradesh	30.91	29.36	95.0	29.05	23.24	80.0	59.96	52.60	87.7
2. Assam	13.35	13.35	100.0	12.74	8.92	70.0	26.09	22.27	85.4
3. Bihar	43.60	43.16	99.0	41.82	16.73	40.0	85.42	59.89	70.1
4. Gujarat	21.64	25.96	120.0	20.21	18.60	92.0	41.85	44.56	106.5
5. Haryana	8.63	8.14	94.3	7.83	4.38	55.9	16.46	12.52	76.0
6. Jammu & Kashmir	2.90	3.41	117.6	2.74	2.19	80.0	5.64	5.60	99.3
7. Kerala	15.94	19.76	124.0	14.85	16.69	112.3	30.79	36.45	118.4
8. Madhya Pradesh	31.24	31.24	100.0	29.38	16.16	55.0	60.62	47.40	78.2
9. Madras	25.56	30.75	120.3	24.02	26.42	110.0	49.58	57.17	115.3
10. Maharashtra	38.28	44.49	116.2	35.74	35.74	100.0	74.02	80.23	108.4

1.		2.	3.	4.	5.	6.	7.	8.	9.	10.
11.	Mysore	19.63	19.84	101.1	18.70	14.67	78.4	38.33	34.51	90.0
12.	Orissa@	13.67	13.52	98.9	13.65	7.68	56.3	27.32	21.20	77.6
13.	Punjab	10.50	8.70	82.8	9.45	5.54	58.6	19.95	14.24	71.3
14.	Rajasthan@	18.54	14.69	79.2	17.10	5.44	31.8	35.64	20.13	56.5
15.	Uttar Pradesh	61.30	62.47	101.9	56.70	35.97	63.4	118.00	98.41	83.4
16.	West Bengal	30.22	27.44	90.8	29.82	16.56	55.5	60.04	44.00	73.3
17.	Nagaland	0.29	0.37	127.5	0.28	0.20	71.4	0.57	0.57	100.0
18.	A & N Islands	0.05	0.06	120.0	0.05	0.03	60.0	0.10	0.09	90.0
19.	Delhi	2.53	2.72	107.5	2.39	2.14	89.5	4.92	1.86	98.8
20.	Goa, Daman & Diu	0.47	0.61	129.7	0.46	0.44	95.6	0.93	1.05	112.9

@ Information received in response to Selected Physical Targets letter.

	11.	12.	13.	14.	15.	16.	17.	18.	19.
11. Mysore	22.25	25.56	115.0	20.85	20.05	100.0	43.03	48.41	107.7
12. Orissa	15.80	17.47	110.0	15.15	10.60	70.0	31.05	28.07	90.5
13. Punjab	12.66	12.66	100.0	11.48	8.61	75.0	24.14	21.27	88.1
14. Rajasthan	21.55	19.83	92.0	19.54	8.80	45.0	41.09	28.33	69.7
15. Uttar Pradesh	67.77	74.54	110.0	63.52	51.73	81.4	131.29	126.27	96.2
16. West Bengal	35.55	34.99	98.4	33.91	23.16	68.3	69.46	58.15	83.7
17. Nagaland	0.33	0.40	121.2	0.30	0.27	90.0	0.63	0.67	106.3
18. A. & N. Islands	0.07	0.088	114.2	0.06	0.06	100.0	0.13	0.14	107.7
19. Delhi	3.44	4.13	120.0	3.21	3.53	110.0	6.65	7.66	115.2
20. Goa, Daman & Diu	0.51	0.71	139.2	0.48	0.54	112.5	0.99	1.25	126.5

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.
21. Himachal Pradesh	2.58	3.44	133.3	2.32	1.54	66.4	4.90	4.98	101.6
22. Manipur* 0.78	0.78	0.77	98.7	0.77	0.43	55.8	1.55	1.20	77.4
23. Tripura@	1.08	0.92	85.2	1.05	0.68	64.8	2.13	1.60	75.1
24. Laccadive, Minicoy and Adindive Islands@	0.02	0.026	130.0	0.02	100.0	0.04	0.06	0.06	115.0
25. N.E.F.A.	0.27	0.24	88.9	0.25	0.06	24.0	0.52	0.30	57.7
26. Pondicherry	0.26	0.31	119.2	0.25	0.23	92.0	0.51	0.54	105.9
27. Chandigarh		N.A.			N.A.			N.A.	
28. Dadra & Nagar Haveli*	0.05	N.A.		0.05	N.A.		0.10	N.A.	
ALL INDIA	366.59	356.77	97.1	350.33	211.19	60.5	716.92	567.96	79.2

@ Information received in response to Selected Physical Targets letter.

* Figures are for the year 1965-66.

	11.	12.	13.	14.	15.	16.	17.	18.	19.
21. Himachal Pradesh	3.10	3.69	119.0	2.81	2.10	75.0	5.91	5.79	97.9
22. Manipur	0.98	0.97	99.0	0.92	6.63	68.5	1.90	1.60	84.2
23. Tripura	1.28	1.17	91.4	1.21	1.03	85.1	2.49	2.20	88.0
24. Laccadive, Minicoy and Amindive Islands	0.02	0.026	130.0	0.02	0.02	100.0	0.04	0.046	115.0
25. N.E.F.A.	0.30	0.30	100.0	0.27	0.10	37.0	0.57	0.40	70.2
26. Pondicherry	0.28	0.36	128.6	0.27	0.35	129.6	0.05	0.71	129.1
27. Chandigarh		N. A.			N.A.			N.A.	
28. Dadra & Nagar Haveli	0.06	N. A.		0.05	N.A.		0.11	N.A.	
ALL INDIA	418.10	446.51	106.7	392.46	301.45	76.8	810.56	747.96	92.3

Statement II

Estimated additional enrolment of pupils in classes VI-VIII in the Fourth Plan and the likely position at the end of the Fourth Plan (1969-74)

(Enrolment figures in lakhs)

Sl. No.	State/Union Territory	Additional enrolment (Full Time)			Additional enrolment (Part Time)			Total enrolment in 1973-74			Percentage of enrolment to the population in the age-group 11-14		
		Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
1.	Andhra Pradesh	2.29	1.26	3.55	0.40	0.16	0.56	8.42	3.53	11.95	50.6	22.0	36.6
2.	Assam	1.10	0.57	1.67	0.17	0.10	0.27	3.72	1.81	5.53	54.4	26.8	40.8
3.	Bihar	2.42	0.63	3.05	0.50	0.10	0.60	9.86	2.00	11.86	41.6	8.7	25.3
4.	Gujarat	2.61	1.54	4.15	0.39	0.20	0.59	8.22	4.31	12.53	72.3	40.6	57.0
5.	Haryana	0.60	0.52	1.12	0.13	0.06	0.19	2.74	1.28	4.02	62.0	32.1	47.9
6.	Jammu & Kashmir	0.30	0.18	0.48	0.05	0.03	0.08	1.11	0.56	1.67	72.1	40.0	56.8
7.	Kerala	1.90	1.75	3.65	0.44	0.35	0.79	8.67	7.12	15.79	102.2	88.9	95.8
8.	Madhya Pradesh	2.71	1.11	3.82	0.44	0.14	0.58	8.57	2.84	11.41	49.8	17.3	33.9
9.	Madras	3.85	3.70	7.55	0.70	0.50	1.20	13.10	9.49	22.59	91.0	68.9	80.2
10.	Maharashtra	4.23	3.22	7.55	0.80	0.50	1.30	15.62	9.33	24.95	77.2	48.2	63.0
11.	Mysore	1.93	1.50	3.43	0.36	0.21	0.57	7.17	4.22	11.39	59.4	36.4	48.2
12.	Orissa	1.85	1.05	2.90	0.25	0.11	0.36	5.19	2.47	7.66	61.7	29.8	45.9

-/-

1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11.	12.	13.	14.
13.	Punjab	0.85	0.85	1.70	0.18	0.11	0.29	3.87	2.38	6.25	59.6	40.7	50.7
14.	Rajasthan	1.79	0.51	2.30	0.26	0.06	0.32	5.64	1.30	6.94	49.0	12.4	31.6
15.	Uttar Pradesh	5.36	1.91	7.27	1.00	0.30	1.30	19.76	5.40	25.16	52.8	15.6	35.0
16.	West Bengal	2.63	1.36	3.99	0.46	0.20	0.66	9.67	4.28	13.95	51.7	23.4	37.7
17.	Nagaland	0.05	0.04	0.09	0.01	-	0.01	0.14	0.08	0.22	82.3	47.0	64.7
18.	A.&N. Islands	0.01	0.004	0.014	-	-	-	0.02	0.01	0.03	50.0	33.33	42.8
19.	Delhi	0.90	0.56	1.46	0.11	0.07	0.18	2.33	1.48	3.81	122.6	90.2	107.6
20.	Goa, Daman & Diu	0.06	0.05	0.11	0.01	0.01	0.02	0.26	0.16	0.42	96.3	59.3	77.8
21.	Himachal Pradesh	0.29	0.12	0.41	0.06	0.02	0.08	1.26	0.42	1.68	79.2	29.4	55.6
22.	L.M.&A. Islands	0.003	0.002	0.005	-	-	-	0.01	0.004	0.014	100.0	40.0	70.0
23.	Manipur	0.07	0.03	0.10	0.01	0.01	0.02	0.26	0.11	0.37	53.0	22.4	37.7
24.	N.E.F.A.	0.03	0.01	0.04	-	-	-	0.06	0.02	0.08	37.5	13.3	25.8
25.	Pondicherry	0.04	0.03	0.07	-	-	-	0.14	0.08	0.22	93.3	53.3	73.3
26.	Tripura	0.12	0.09	0.21	0.02	0.01	0.03	0.38	0.26	0.64	62.2	42.6	52.4
	GRAND TOTAL:	37.99	22.69	60.68	6.75	3.25	10.00	136.19	64.84	201.13	60.6	30.4	45.9

Statement III

Elementary Education - Government Cost of Programmes in the Fourth Plan.

(Rs. crores)

Name of scheme		Total Cost	Cost of Buildings	Cost of Equipment
1.	Pre-primary education	1.00	0.15	0.15
2.	Additional enrolment			
	a) classes I-V	151.30	-	-
	b) classes VI-VIII	84.85	-	-
	c) Part-time literacy classes	10.00	-	-
	Total(Additional enrolment)	246.15	-	-
3.	Special programmes for girls	20.00	5.00	-
4.	School meals and free text-books			
	a) School meals	10.00	-	-
	b) Text-books	3.00	-	-
	Total(Mid-day meals & text-books)	13.00	-	-
5.	Reduction of wastage and stagnation	1.00	-	-
6.	Qualitative improvement			
	a) Strengthening of State Institutes of Education	1.50	0.20	0.10
	b) Buildings and equipment			
	i) Classes I-V	14.70	12.50	2.20
	ii) Classes VI-VIII	12.00	10.00	2.00
	c) Introduction of work experience	5.00		1.50
	Total:(Qualitative improvement)	33.20	22.70	5.80

(Rs. crores)

Name of scheme	Total cost	Cost of Buildings	Cost of equipment
7. Strengthening of teaching of science			
(i) Strengthening of existing 1400 teacher training schools	1.40	-	1.40
(ii) Provision of science kits to 21,000 primary schools	0.42	-	0.42
(iii) In-service training of 21,000 Primary School teachers	0.41	-	-
(iv) Twenty-mobile laboratory-cum-training vans	0.17	-	0.17
(v) Establishing 150 science training centres	16.74	6.00	1.50
(vi) In-service training of 14,000 middle school teachers	0.89	-	0.05
(vii) Science study rooms and equipment for 20,000 middle schools	2.00	1.00	1.00
Total(Science Education)	22.03	7.00	4.54
8. Incentive payments to teachers	5.00	-	-
9. Provision of additional inspecting staff	9.40	-	-
Total TOTAL:	350.78	34.85	10.49

Since items Nos. 6(a), 7(i), 7(iii), 7(iv), 7(v) and 7(vi) relate to teacher training, provision for these items is being made in the teacher training sector. Thus the net provision for Elementary Education will be Rs. 329.67 crore of which Rs. 28.65 crore is for buildings and Rs. 7.27 crore for equipment.

ANNEXURE IV

PLANNING COMMISSION
(Education Division)

...

SECONDARY EDUCATION IN THE FOURTH PLAN

Introduction

Since Independence, there has been a phenomenal increase in the facilities for secondary education. There were about 7,300 high and higher secondary schools in the country in 1951. Their number is estimated to have risen to about 28,000 in the current year. Enrolment in secondary classes is expected to go up from about 12.10 lakh in 1951 to about 68 lakh at the end of 1968-69. Despite this expansion, some sections of the population, particularly girls, have not shared adequately the benefits of secondary education. Also, new schools have been established without much forethought, with the result that while there is a concentration of schools in some areas, there are many backward areas which have inadequate facilities for secondary education.

2. It is recognised that secondary schools have two main aims. They prepare a minority of bright students for pursuing higher studies at the university level. To others, they offer an all-round general education with vocational bias so that they can make an easy transition from the school to the world of work. Following the recommendations of the Mudaliar Commission two important changes were introduced in some secondary schools: (a) the duration of the secondary course was lengthened by a year to ensure better preparation for higher education, and (b) practical courses were introduced, in addition to core subjects, for those who desired to complete their education at the secondary stage. Other recommendations related to revision of curricula, preparation of good text-books, examination reform, training of teachers etc. The Kothari Commission has reviewed the progress in the implementation of these reforms. It has suggested a two-year higher secondary course preceded by a ten-year course of general education. The Kothari Commission has also laid stress on work experience, vocationalisation of secondary education, revision of curricula, text-books, examination reform etc. These recommendations form the basis for the programmes for secondary education included in the Fourth Plan.

Main objectives

3. Keeping in view (a) the increasing demand for secondary education, (b) the urgency for enriching the content and improving the quality of secondary education, and (c) the constraint of resources, the following approach is suggested in formulating programmes for secondary education in the Fourth Plan:

(i) While making adequate provision for the inescapable growth in enrolment at this stage consequent upon the increasing enrolment at the elementary stage, great care should be taken to ensure that substandard schools are not opened during the Fourth Plan. This can be achieved through a strict enforcement of the grant-in-aid rules for the recognition of new schools. Further, the location of new schools, should be determined strictly in accordance with the needs of each area, taking into consideration the optimum utilisation of the facilities already available in the area. Special efforts will also be made to promote and strengthen secondary education in the rural and backward areas.

(ii) While the programmes for improving the quality of secondary education, relating to the revision of curricula, text-books, examination reform etc. should be continued and strengthened, the highest priority in the Fourth Plan should be given to the development of science education and the vocationalisation of secondary education.

(iii) Owing to paucity of resources, it will not be possible for the Government to contribute towards the construction of school buildings. The local community should normally bear the entire cost of the buildings. An exception may, however, be made in the case of science laboratory rooms and school buildings for backward areas and provision should be made in the Plan for their construction with government assistance.

(iv) A lower priority should be assigned to the introduction of the new pattern of secondary education recommended by the Kothari Commission. However, sufficient funds should be provided in the Plan to enable the States which have already initiated the process of reorganisation to complete it during the Fourth Plan.

4. Keeping in view the objectives indicated above, detailed schemes have been suggested in the paragraphs that follow for inclusion in the Fourth Plan.

Additional enrolment

5. On the basis of the past trends in the growth of enrolment in secondary classes (IX-XI) it has been estimated that the additional enrolment in these classes

during the Fourth Plan may be about 33 lakh pupils (boys 22.50 lakh and girls 10.50 lakh). The details are given in Statement I. If this target is realized the total enrolment in secondary classes will rise at the end of the Fourth Plan to 97.17 lakh pupils (boys 70.99 lakh and girls 26.18 lakh). The percentage of this enrolment to the total population in the age-group 14-17 will be 24.6 - boys 35.2 and girls 13.5. In this connection it may also be useful to mention that the State Governments had proposed additional enrolment target totalling 31.45 lakh students for the period 1966-71.

Cost per pupil

6. According to the Second Educational Survey the teacher-pupil ratio in these classes in 1965-66 was 1 : 22. In the present note, the ratio has been assumed as 1 : 25. The average annual salary of a fresh trained graduate teacher during 1968-69 has been estimated at Rs. 2,880 and that of a fresh post-graduate teacher Rs. 4,200/-. According to the Second Educational Survey the ratio of post-graduate teachers to graduate teachers was 2 : 5.4. It is assumed that in the Fourth Plan this ratio will be 2 : 5. On this basis the per pupil cost in respect of emoluments including provident fund contribution and other benefits for teaching staff will be about Rs. 143/- per annum. To this may be added 42% or Rs. 60 to cover the cost of non-teaching staff, contingencies and other direct costs. Thus, the total per pupil cost may be assumed at about Rs. 200/- per annum.

Cost of additional enrolment

7. Owing to the increase in the teacher-pupil ratio suggested in paragraph 6 above, it will be possible for the existing staff in secondary schools to teach 9 lakh additional children. Thus, it will be necessary in the Fourth Plan to provide for additional staff etc. for 24 lakh additional children only. The total cost on this account is estimated at Rs. 144 crore. Further, it has been assumed that the cost to government will be about 70% of this expenditure i.e. Rs. 101 crore (the Government share of expenditure on secondary education was 62% in 1962-63).

Correspondence courses

8. During 1968-69, a beginning has been made by the Education Directorate, Delhi to offer correspondence courses at the secondary stage to employed persons. It is proposed to expand this programme in the Fourth Plan in the light of the experience gained at Delhi. A provision of Rs. 50 lakh is proposed for this purpose on an ad hoc basis.

Social programmes for girls

9. It will be necessary to provide special facilities like scholarships, women teachers' quarters, girls' hostels and sanitary blocks in mixed schools. A sum of Rs. 7.50 crore is provided on an ad hoc basis.

Scholarships

10. A provision of Rs. 5.00 crore is proposed for scholarships for bright pupils from poor families particularly those coming from rural areas who have to live in hostels away from home in order to complete their secondary education.

General improvement programmes

11. (i) Incentive payments to teachers - An ad hoc provision of Rs. 2.0 crore is suggested for incentive payment to teachers who improve their academic or professional qualifications through regular or correspondence or in-service courses. Any general improvement in salary scales of secondary teachers will be met from non-Plan resources.

(ii) Other improvements in secondary schools - During the Third Plan, State Governments had formulated a number of schemes to: (i) develop and upgrade curricula, (ii) produce better text-books, (iii) improve evaluation techniques; (iv) provide educational and vocational guidance services and (v) improve school libraries. An ad hoc provision of Rs. 10.00 crore is made in the Fourth Plan to strengthen these programmes.

Work experience and vocationalisation of secondary education

(i) Work Experience - It will not be possible, owing to dearth of resources, to introduce work experience in all schools during the Fourth Plan on the lines recommended by the Kothari Commission. It is, therefore, proposed to introduce this programme on a pilot basis. The emphasis will be on utilizing the facilities already found in post-basic schools, multi-purpose schools, technical high schools etc. A provision of Rs. 5.0 crore is proposed on an ad hoc basis for: (a) research and experimentation, (b) publications, (c) in-service training and (d) equipment.

(ii) Vocationalisation - The details of this programme are being worked out.

Development of Science education

13. (i) Strengthening of State Institutes of Science Education - State Institutes/Units of Science Education were established towards the end of the Third Plan to develop curriculum in Science and Mathematics, to prepare better text-books, teachers' handbooks etc. to organise

in-service training courses and generally to assist the State Directorates of Education in all matters relating to the teaching of science in schools. In some of the States, the Institutes have not been set up so far and in others, the Institutes are not staffed and equipped properly. It is proposed to provide for the development of the Institutes at the rate of Rs. 3 lakhs every year. For 20 Institutes, the cost will come to Rs. 3.00 crores.

(ii) Science Units in the Directorate of Education - At present there are no technical units in the Directorates of Education to guide and administer the development programmes in the field of science education. This is proving to be a major hindrance in the efficient implementation of these programmes. Accordingly, it is proposed to set up 20 science units at a cost of Rs. 50,000/-, each per year. The cost will be Rs. 50 lakhs.

(iii) Science Supervisors in the Districts - The need for science supervisors attached to the District Inspector's office is now accepted. It is proposed to appoint about 150 science supervisors during the Fourth Plan at a cost of Rs. 12,000/- per annum per supervisor. The cost of this programme phased over a period of 5 years will be about Rs. 54 lakhs.

(iv) Pre-service training - The present arrangements for pre-service training of science and mathematics teachers have been found to be far from satisfactory as in these courses very little emphasis is laid on the content of science. It is considered advisable to entrust this work to the Universities, who, with the assistance of their science and education departments, can organise specialised pre-service courses in content and methodology. To begin with, these courses may be organised in 15 universities during the Fourth Plan. A sum of Rs. 75 lakhs as non-recurring at the rate of Rs. 5 lakh per centre for building additional hostel accommodation, equipment, etc. is provided for this scheme. The recurring cost of the phased programme for staff and stipends will be Rs. 1.40 crores.

(v) Construction of additional laboratories - According to the Second All-India Educational Survey, there are more than 8,000 secondary schools where there are no laboratory facilities available. As science is proposed to be made a compulsory subject for all students throughout the school stage, it will be necessary to assist these institutions to construct new laboratories. The average cost of construction of a composite laboratory with its

fixtures and fittings is estimated at Rs. 15,000/- The total cost of providing laboratories to these existing schools will be Rs. 12 crores.

Besides this, it is expected that 4,000 new secondary schools will come up during the Plan period. The responsibility for providing laboratory buildings may be taken by the State Governments for which an additional provision of Rs. 6 crores will be needed.

(vi) Supply of equipment to new and existing institutions - It is proposed to provide science equipment at a cost of Rs. 10,000/- per school to all new high schools (about 4,000 in number) and assist another 8,000 existing high schools at a cost of Rs.6,000/- per school. This will enable these schools to teach science up to class X as recommended by the Kothari Commission. The total cost of this programme will be Rs. 8.8 crores.

(vii) Provision of laboratories, equipment for elective courses in science in 12-year schools - Some of the States have decided to adopt the higher secondary course of two years' duration as recommended by the Kothari Commission. The Higher Secondary classes will be started either in the colleges or in selected good schools. In some of the States 11-year higher secondary classes already exist. Some of these schools may be upgraded to the new pattern. It is, therefore, proposed to establish elective courses in science in the two year higher secondary classes in about 500 higher secondary schools at an average cost of Rs. 1.0 lakh per school to cover the cost of laboratory rooms, science equipment, books, etc. The cost of this programme will be Rs. 5 crores.

(viii) Provision of science equipment for the laboratories of the existing teacher training colleges - In spite of starting new pre-service programmes for secondary school science teachers, a majority of the science teachers for the high schools will continue to be prepared for quite some time by the existing teacher training colleges. Efforts are being made to improve the science and mathematics programmes being offered in these colleges by including the content of science along with its methodology. The training colleges have, however, no facilities of laboratory to develop the practical skills and demonstration techniques in future teachers of science. To enable them to handle such programmes, it is proposed that each of the existing 250 teacher training colleges may be assisted to equip science laboratories for physics, chemistry and

biology and develop a small workshop at a cost of Rs. 20,000/- per institution. A sum of Rs. 50 lakhs is proposed for this purpose.

(ix) Inservice training programme for secondary school teachers - With the upgrading and modernising of the science curriculum, it will be necessary to retrain the existing science and mathematics teachers of the senior secondary classes. It is proposed to train 10,000 secondary school teachers through a two-month inservice course through selected teacher training colleges with the active assistance of science colleges. A provision of Rs. 72 lakhs is proposed for this programme.

Out of Class Science activities

14. (i) Establishing Science Clubs in Secondary schools - The science courses offered through the school curriculum are most directed to cater to the needs of the average learner. Experience in different countries has shown that the science clubs provide an excellent forum to cater to the needs and to arouse the curiosity and nurture the talent of the gifted students in science. It is proposed that 10,000 secondary schools may be assisted during the plan period with grant of Rs. 1,500/- per school to establish science clubs. A sum of Rs. 1.5 crores is proposed for this purpose.

(ii) Organising Science Fairs at various levels - To constantly energise the science clubs, it is necessary to provide them with a forum to exchange ideas and to inculcate a spirit of competition for constant improvement in their performances. The science fairs provide an opportunity to achieve these objectives. It is proposed that during the plan period each district should organise a science fair for its schools and similarly each State should also organise a science fair where the district competitors could compete and share their experiences with other schools. The State Institute of Science and the district supervisors can organise these activities at the State and District levels. The NCERT may be entrusted to organise a national level science fair which will provide a forum to locate gifted students in science. A provision of Rs. 10 lakhs for the plan period is proposed for this activity.

(iii) Training courses for science club sponsors - Experience during the second and third plan periods has shown that the activities in science clubs become static at the level of classification, collection, duplication and model making, unless the science club sponsors are oriented to develop new ideas. It is proposed that the State

Institutes of Science should organise orientation courses for science clubs sponsors of those schools which will receive assistance for establishing science clubs. A provision of Rs. 10 lakhs is proposed for this activity.

(iv) Establishment of State Science Museums - Science museums play a very important role in helping the children as well as adults develop a correct understanding of science and appreciate its role in life and national economy. It is proposed that during the Plan period 10 such units may be developed at the state headquarters at a cost of Rs. 5 lakhs per unit. These State Museums will ultimately provide ar excellent forum to organise the State level science fairs and give impetus to science club movement in general. The cost for this scheme during the Plan period will be Rs. 50 lakhs.

Physical Education, Jr.N.C.C. and Social Service Programmes

15. An ad hoc provision of Rs. 10.0 crore is made for these schemes.

School buildings

16. The Steering Group at its third meeting decided generally not to make any provision for school buildings. However, in view of the fact that a large number of new secondary schools will have to be opened in backward rural areas and in the slums of towns and cities, a provision of Rs. 25.00 crore is made for construction of school buildings.

Outlays

17. The total provision suggested for secondary education (excluding provision for pre-service and in-service training of science teachers) works out to about Rs. 201.00 crores (vide details at Statement II). This allocation is only Rs. 1 crore higher than the ceiling of Rs. 200 crore suggested by the Steering Group.

Likely position of enrolment in Classes IX-XI in 1968-69 and targets for 1973-74

(Enrolment and population figures in lakhs)

Sl. No.	Name of the State	1968-69									1973-74								
		Boys			Girls			Total			Boys			Girls			Total		
		Popul-ation	Enro-lment	4 as %of 3	Popul-ation	Enro-lment	7 as %of 6	Popul-ation	Enro-lment	10 as %of 9	Popul-ation	Enro-lment	13 as %of 12	Popul-ation	Enro-lment	16 as %of 15	Popul-ation	Enro-lment	19 as %of 1
1.	2.	3.	4.	5.	6.	7.	8.	9.	10.	11	12.	13.	14.	15.	16.	17.	18.	19.	20.
1.	Andhra Pradesh	12.98	3.33	25.6	12.94	0.98	7.6	25.92	4.31	16.7	14.93	4.99	33.4	14.73	1.71	11.6	29.66	6.70	22.6
2.	Assam	5.02	1.94	38.6	4.99	0.71	14.2	10.01	2.65	26.5	6.01	2.91	48.4	6.05	1.24	20.5	12.06	4.15	34.4
3.	Bihar	19.27	4.54	23.6	18.46	0.48	2.6	37.73	5.02	13.3	21.99	6.36	28.9	21.62	0.84	3.9	43.61	7.20	16.5
4.	Gujarat	8.68	2.66	30.6	8.15	0.85	10.4	16.83	3.51	20.8	10.15	3.99	39.3	9.50	1.36	14.3	19.65	5.35	21.2
5.	Jammu & Kashmir	1.32	0.29	21.9	1.18	0.11	9.3	2.50	0.40	16.0	1.41	0.41	29.1	1.26	0.19	15.1	2.67	0.60	22.5
6.	Kerala	6.68	2.59	38.8	6.56	2.07	31.5	13.24	4.66	35.2	7.70	3.88	50.4	7.35	3.31	45.0	15.05	7.19	41.8
7.	Madhya Pradesh	12.75	2.84	22.3	12.33	0.62	5.0	25.08	3.46	13.8	15.67	4.26	27.2	15.18	1.09	7.2	30.85	5.35	17.3
8.	Madras	11.76	4.70	39.9	11.60	2.30	19.8	23.36	7.00	30.0	13.39	7.05	52.6	12.98	4.03	31.0	26.37	11.08	42.0
9.	Maharashtra	15.73	5.66	36.0	15.00	2.11	14.0	30.73	7.77	25.3	18.08	8.49	47.9	17.37	3.69	21.0	35.65	12.18	34.1
10.	Mysore	8.96	2.34	26.1	8.83	0.85	9.6	17.79	3.19	17.9	10.78	3.28	30.4	10.48	1.36	13.0	21.26	4.64	21.8
11.	Orissa	6.49	2.00	30.8	6.74	0.40	5.9	13.23	2.40	18.1	7.50	3.00	40.0	7.65	0.70	9.2	15.15	3.70	24.4
12.	Punjab & Haryana	9.05	1.85	20.4	7.96	0.81	10.1	17.01	2.66	15.6	10.53	2.59	24.6	9.33	1.30	13.9	19.86	3.80	19.8
13.	Rajasthan	8.56	1.56	18.2	8.00	0.27	3.4	16.56	1.83	11.1	10.21	2.34	22.9	9.45	0.49	5.2	19.66	2.83	14.4
14.	Uttar Pradesh	28.58	7.71	27.0	26.80	1.59	5.9	55.38	9.30	16.8	33.96	10.79	31.8	31.35	2.54	8.1	65.31	13.33	20.4
15.	West Bengal	13.60	3.42	25.1	13.56	0.94	6.9	27.16	4.36	16.1	16.43	5.79	35.2	16.41	1.41	8.6	32.84	7.20	21.9
16.	Nagaland	0.14	0.03	21.4	0.14	0.01	7.1	0.28	0.04	14.3	0.15	0.04	26.6	0.16	0.02	12.5	0.31	0.06	19.4
17.	A.& N. Islands	0.03	0.008	26.6	0.02	0.002	10.0	0.05	0.010	20.0	0.03	0.016	53.3	0.03	0.004	13.3	0.06	0.02	33.3
18.	Goa, Damn & Diu	0.21	0.10	47.6	0.21	0.06	28.6	0.42	0.16	38.1	0.27	0.17	62.9	0.27	0.11	40.7	0.54	0.28	51.8
19.	Delhi	1.39	0.76	54.7	1.14	0.43	37.7	2.53	1.19	47.0	1.78	1.14	64.0	1.46	0.73	50.0	3.24	1.87	57.7
20.	Pondicherry	0.12	0.06	50.0	0.12	0.03	25.0	0.24	0.09	37.5	0.14	0.09	64.3	0.14	0.04	28.6	0.28	0.13	46.4
21.	Tripura	0.41	0.12	29.2	0.44	0.05	11.4	0.85	0.17	20.0	0.50	0.18	36.0	0.54	0.07	12.9	1.04	0.25	24.0
	Total	171.73	48.51	28.2	165.17	15.67	9.5	336.90	64.18	19.0	201.61	70.99	35.2	193.51	26.18	13.5	395.12	97.17	24.6

Statement II

Outlays suggested for development programmes for secondary education in the Fourth Plan

(Rs. crore)

		Total cost	Cost in Buildings	Cost on equipment
1.	Additional enrolment (classes IX-XI)	101.00	-	-
2.	Correspondence courses	0.50	-	-
3.	Special programmes for girls	7.50	2.50	0.10
4.	Scholarships	5.00	-	-
5.	Improvement programmes:			
	(i) Incentive payment to teachers	2.00	-	-
	(ii) Other improvement programmes	10.00	-	0.50
6.	Work Experience	5.00	-	0.50
7.	(A) Development of Science Education			
	(i) Strengthening of State Institute of Science Education	3.00	0.50	0.50
	(ii) Science Units in the Directorates of Education	0.50	-	-
	(iii) Science Supervisors in the Districts	0.54	-	-
	(iv) Pre-service training	2.15	0.50	0.25
	(v) Construction of additional laboratories	18.00	18.00	-
	(vi) Supply of Science equipment	8.80		8.80
	(vii) Laboratories and equipment in Higher Secondary Schools	5.00	3.50	1.50
	(viii) Science equipment for training colleges	0.50		0.50
	(ix) In-service training	0.72	-	
	(x)			
	(B) Out-of class Science Activities			
	(i) Establishing science clubs in Secondary Schools	1.50	-	1.50
	(ii) Organising Science Fairs	0.10	-	-
	(iii) Training Courses for Science club sponsors	0.10	-	-
	(iv) Establishment of State Science Museums.	0.50	0.25	0.25
	TOTAL(SCIENCE EDN.)	41.41	22.75	11.80
8.	Physical Education Jr. N.C.C. and Social Services	10.00	-	0.50
9.	Buildings	25.00	25.00	-
	Total:	207.41	50.30	13.40

Since items Nos. 7A(i), (iv), (viii) & (ix) relate to teacher training, expenditure on these items has been provided in the teacher training sector. Thus the provision for secondary education in the Fourth Plan is estimated at Rs. 201.04 crore of which Rs. 49.30 crore is for building and Rs. 12.15 crore is for equipment.

ANNEXURE V

PLANNING COMMISSION
(EDUCATION DIVISION)

UNIVERSITY EDUCATION IN THE FOURTH PLAN

Introduction

The contribution of institutions of higher education to the socio-economic development of the country can be hardly over-emphasised. In the development countries, like India, this role assumes an added significance because the pace and quantum of economic and industrial advancement is determined primarily by the quality of the professional and technical manpower trained in universities and collegiate institutions. It is, therefore, necessary that adequate priority should be given to the quantitative expansion and qualitative improvement of higher education.

2. During the Fourth Plan the emphasis needs to be laid on consolidation and improvement of quality of higher education e.g. strengthening of staff, library and laboratory facilities etc. Specific attention would also be paid to some of the important newly emerging inter-disciplinary fields and special efforts would be directed towards improving substantially the conditions of work and service of teachers as the quality of education depends essentially on the quality of teachers. Nothing is more important than to attract and retain in the academic profession men of outstanding ability, competence and dedication. Further, in the context of the recent unrest among students, priority has to be given to welfare programmes for students like hostels, day-centres as also to 'reading seats' in libraries. This would be an essential step for raising the academic standards as living conditions of a majority of the students are such that they do not provide congenial atmosphere for serious academic work. It would also be desirable that a substantial portion of the staff resides in or near the campus. That would help to promote a corporate intellectual life and closer contact between academic staff and student. It will also be necessary to start evening colleges and correspondence courses to cater to the needs of those who cannot take advantage of full-time day institutions.

3. Consistent with the needs of our developing economy, high priority needs to be given to raising the level of education in science and technology (agricultural education and research should receive special attention particularly in the context of the present agriculture based economy of India).

4. An important task in the entire programme of university education is to promote first rate centres of post-graduate studies and research in the universities. No university, not even in the most advanced countries can afford to go in for advanced specialisation in all fields. In fact, one of the most important things for a university is to select carefully subjects/fields for high level specialisation constituting areas of special concentration of efforts and resources of the university. Such a selection must take into account existing facilities and potentialities for further growth and it should contain an element of flexibility and adjustment to take account of future developments. In addition to special efforts of this kind, it is necessary to take several steps to strengthen the system of higher education by having an expanding programme of seminars and summer institutes to be followed up by a programme of improvement of curricula, reform of examinations and provision of increased facilities for research work by teachers and talented students. It is also essential to make university education more library centred and introduce measures to provide adequate library services in universities and colleges.

Priorities 5. In the light of the foregoing, the Fourth Plan programmes of higher education would provide for the following:-

1. Expansion and improvement of post-graduate education and research including establishment of university centres of post-graduate study, including special assistance for selected university departments of post-graduate study and research and development of inter-disciplinary and intra-disciplinary subjects.

2. Expansion and improvement of science education.

3. Development of centres of advanced study.

4. Expansion and improvement of college education - post-graduate and under-graduate courses.

5. Special assistance for selected colleges.

6. Improving the professional and academic competence of teachers through the organisation of seminars, summer institutes and refresher courses.

7. Library development.

8. Award of scholarships and fellowships.

9. Student and teachers amenities and services.

Additional enrolment

16. The additional enrolment in institutions of higher education in the courses of Arts, Science and Commerce has been calculated by computing the 'transfer ratios' of the number of students at the school stage and the college stage after the lapse of specified period. The detailed estimates of additional enrolment are given in the Appendix 1. It has been reckoned that the total enrolment in Arts, Science and Commerce courses including P.U.C. and intermediate classes of Bombay University (excluding U.P. Intermediate) will increase from 16.93 lakhs in 1968-69 to 26.28 lakhs indicating an additional enrolment of 9.35 lakhs. The distribution of the additional enrolment stage-wise has been indicated in the Table 1 below:

Table 1. Enrolment in Arts, Science and Commerce(Higher Education)

(000's)

1.	1968-69 2.	1969-70 3.	1970-71 4.	1971-72 5.	1972-73 6.	1973-74 7.	Addl. enrolment IV Plan 8.
Pre-University	512	558	608	663	723	788	276
Intermediate (Other than U.P. Board)	50	55	60	65	71	77	27
Under-graduate	1,007	1,118	1,247	1,312	1,409	1,540	533
Post-graduate and Research	124	138	157	176	198	223	99
Total:	1,693	1,869	2,072	2,216	2,401	2,628	935*

* It is assumed that 35,000 students will be educated through correspondence courses.

7. .It is estimated that the additional enrolment in Law during the Fourth Plan would be 30,000. This has been estimated on the basis of a growth rate of 9% per annum. So far as teacher education is concerned, calculations have been indicated in a separate paper on the subject.

Cost of Expansion and Improvement

8. In view of the substantial cost-differentials in university departments and affiliated colleges consequent upon the varying scales of pay of academic staff, teacher pupil ratio and tother amenities, an attempts has been made to work out separate cost estimates per student in university departments and affiliated colleges. Assuming that the present proportion of 12 : 88 between university departments and affiliated colleges would continue, the additional enrolment in university departments and affiliated colleges in the Fourth Plan would be distributed as under:-

University departments	1.08 lakhs
Affiliated colleges	7.92 lakhs
Total:	9.00 lakhs

9. The average annual cost per student has been calculated separately for university departments and affiliated colleges on the basis of teacher costs worked out on the assumption that all new teachers will be given the revised scales recommended by the University Grants Commission plus D.A. at Central Government rates. To this has been added non-teacher costs at the rate of 45% of total costs in the university teaching departments and 33% in colleges. The details of these calculations have been explained in the note at Appendix II.

10. The average annual recurring cost per student, which has formed the basis of projections of expenditure on higher education during the Fourth Plan is indicated below:-

University Departments	Rs. 1219
Affiliated Colleges	Rs. 510

11. The non-recurring cost was calculated on the basis of norms of costs adopted by the All-India Council for Technical Education for the Engineering Colleges minus costs of items like workshops, tool rooms etc. The non-recurring cost per student is as under:-

Arts Courses	Rs. 760
Science Courses	Rs. 1570@

(including laboratory, buildings, equipment and library)

12. The detailed calculations of cost both recurring and non-recurring for the expansion and improvement of facilities for higher education are given below:-

I. Recurring

(a) University Departments

Enrolment	1.08 lakhs (vide Appendix I)
Cost per student	Rs. 1219
Total cost	1219 x 3 x 1.08 = Rs. 3950 lakhs*
	* Including expenditure on Post-graduate Education)
Cost to Government @ 80%	Rs. 3160 lakhs....I

(b) Affiliated Colleges

Enrolment	7.92 lakhs
Cost per student	Rs. 510
Total cost	7.92 x 510 x 3 = Rs. 12118 lakhs*
	* Including expenditure on Post-graduate Education.
Cost to Government @ 50%	Rs. 6059 lakhs....II

(c) Correspondence Courses

Enrolment	0.50 lakhs*
Cost per student	Rs. 200
Total cost	0.50 x 200 x 3 = Rs. 300 lakhs.
Cost to Government @ 50%	Rs. 150 lakhs....III

---

* Reference Page 96 in Appendix I.

(d)	Cost of improvement of present facilities @ Rs. 50,000/- for Arts Colleges and Rs. 1,00,000/- for Science and Arts Colleges at an average rate of Rs. 75,000/- per College for 2000 Colleges.	Rs. 1500 lakhs...IV
	Total cost to the Government (I+II+III+IV)	Rs. 10869 lakhs...(A)

II. Non-recurring costs

Out of 9 lakhs additional enrolment, about one lakh enrolment will be in the evening colleges. It is estimated that about 3 lakhs students including 1 lakh in Science Courses would be accommodated in the existing institutions. Facilities will have to be provided for about 5 lakhs students @ Rs. 760 per student.

Enrolment	5 lakhs
Cost per student	Rs. 760
Total cost	Rs. 3800 lakhs
Cost to Government at the rate of 50%	Rs. 1900 lakhs....(B)

III. Additional cost on account of Science

Enrolment		3 lakhs
Cost per student	Rs	Rs. 810
Total cost	R	Rs. 2430 lakhs
Cost to Government @ 75%		Rs. 1823 lakhs....(C)
Total cost of Expansion and Improvement (A)+(B)+(C)		Rs.14592 lakhs

13. The other important programmes of higher education along with their cost estimates are indicated below:

Expansion of Post-graduate Education & Research

14. The Education Commission has recommended that the bulk of post-graduate and research work should be organised in the universities or in university centres where good programmes can be developed by cooperation of 3 or 4 colleges under the guidance of the university. The universities and the university centres will have to shoulder the responsibility for about 80 per cent of the post-graduate and research work as against 55 to 57 per cent at present. Only some good affiliated colleges of long standing which have done creditable work at the under-graduate and or post-graduate level should be allowed to carry on post-graduate and research work. The universities thus have a tremendous additional responsibility to undertake. This would mean providing for at least a 2-fold increase in the post-graduate enrolment in the universities in the next five years and creation of facilities for catering to this additional number as well as improvement of the facilities for the existing numbers. The post-graduate courses occupy a key position in the university system and also represent a sector of manageable dimensions. Improvement of post-graduate education will have an immediate impact on the quality of teachers and good teachers have a multiplying effect on the quality and standard of the entire educational system.

Science Education

15. There has been rapid expansion of Science Education at the university stage during the past two decades. The enrolment in science subjects in 1965-66 was 5,65,244 out of a total enrolment of 14,37,178 in Arts, Science and Commerce courses, which works out to about 40% of the total against about 30% in 1950-51. There has been considerable expansion in the post-graduate and research enrolment in science and science-based courses.

16. In the Fourth Plan, it is proposed to further expand and diversify science education so as to meet the growing demand for scientists in various disciplines. The main emphasis will, however, be on the qualitative improvement of science education so as to raise it to the level and content of education in scientifically advanced countries. In view of the large outlays involved in the process, it would be necessary to work on the basis of selectivity and to draw up a phased programme so that, in course of time, all institutions are developed.

17. It is proposed to lay particular emphasis on the improvement of facilities at the post-graduate and research level. For this purpose, the centres of advanced study set up in various universities will be strengthened. It is also proposed to encourage inter-disciplinary and intra-disciplinary research through the setting up of clusters of advanced centres in related subjects. Research in science subjects is to be integrally related to the needs of the industry - present as well as future - so far as they could be comprehended. Special emphasis is proposed to be laid on the development of mathematics in universities and colleges.

18. In accordance with the recommendations of the Education Commission, suitable short term training courses will be organised for science graduates who are not gainfully employed in vocations requiring the knowledge of science courses possessed by them.

19. It is also proposed to lay emphasis on the setting up of instrumentation workshops and computer facilities etc. at the universities. This will promote research in universities.

20. A paper giving details of the various programmes for the development of science education in physical and financial terms at the university stage is enclosed. Most of the programmes contemplated in the paper have been incorporated under relevant schemes indicated in the Summary Statement. Necessary provision has however, been made for the programmes which are in addition to those indicated therein.

Centres of Advanced Study and Research in Universities

21. The scheme is a continuing programme and is intended to encourage the pursuit of 'excellence' and team work in studies and research and to accelerate the attainment of higher standards in specific fields of study. So far 30 Centres (17 in Science subjects and 13 in Humanities) have been recognised for advanced research in various fields of Science, Humanities and Social Sciences. It is proposed to further develop the existing Centres and to develop some other promising departments as advanced Centres. Emphasis will be laid on the development of inter-disciplinary and intra-disciplinary research by the setting up of 'clusters' of Advanced Centres in allied subjects. A sum of Rs. 15 crores has been provided for the purpose in the Fourth Plan. This also includes provision for encouraging research work in sciences as well as Humanities in universities and colleges.

New Universities/ University Centres

22. The Planning Commission in their paper: Approach to the Fourth Plan has suggested that preference should be given to the full utilisation of facilities in existing institutions than creating new ones. The Conference of Education Secretaries convened by the Ministry of Education in March, 1968, also strongly pleaded for self-restraint in the establishment of new universities.

For the Fourth Plan, it is envisaged that no new university would be established unless the need for it is clearly established and adequate resources can be found for the purpose. Provision has, however, to be made for the universities, the establishment of which has already been agreed to like the second university at New Delhi as also the establishment of another university in Kerala. In the case of other States, proposing to establish new universities, it has been suggested that in the first instance university centres may be set up which will provide facilities of a university standard and which may later on be developed into full fledged universities. An amount of Rs. 15 crores has been proposed.

Special assistance to selected colleges

23. The Education Commission (1964-66) has recommended special assistance to outstanding colleges. This will cost Rs. 3 crores @ Rs. 3 lakhs per college for an estimated number of 100 such colleges in the Fourth Plan.

Summer Institutes and follow-up Programmes including modernisation of curricula

24. The Education Commission (1964-66) has described the programme of summer institutes as "a major instrument in the country's effort towards improvement of science education in school and colleges". This programme, undertaken in collaboration with the U.S. National Science Foundation, has grown in dimensions over the years has been widely welcomed by teachers. During the past five years over 400 institutes have been organised in sciences which have provided training facilities to more than 16000 school and college teachers. Special institutes are also organised for the benefit of talented under-graduate students, teachers in English and Social sciences. The summer institutes in English Language Teaching are being undertaken in cooperation with the British Council. There is an urgent need to undertake follow-up activities so that the summer institute training can be effectively utilised by the teachers. A number of follow-up activities have already been started such as Research Participation Programme for College teachers and students, provision of semi-micro analysis equipment, college development programme,

development of demonstration equipment and teaching aids, preparation of curricular and instructional materials. There is need to expand this programme so as to increase the coverage of teachers. It would be necessary to organise at least 850 institutes during the Fourth Plan period with an enrolment of about 40,000 teachers. The cost of organising these summer institutes and the follow up activities during the Fourth Plan would be of the order of Rs. 4 crores (excluding the amount to be spent by the NCERT for the school level programmes).

Students Welfare Programmes

25. The rapid expansion of education at the higher level has underlined the necessity of making student welfare an integral part of the academic life of the universities. The increase in the size of the universities, apart from other needs, calls for a technique which can personalise the student welfare and give him a sense of belonging and a feeling of self-reliance. Without such a programme, the mere expansion of higher education may lead to unhappy results like the educational institutions have witnessed in the recent past and which has done incalculable harm to the cause of education in the country.

26. It is proposed that during the Fourth Plan, the following schemes which have a direct bearing on the welfare of the students may be taken up:-

27. Improvement of hostel facilities - Assistance may be given to universities for making adequate sanitary arrangements (urinals, water closets etc.) and providing suitable dining facilities in hostels. An amount of Rs. 1 crore may be allocated for this scheme. Assistance may particularly be provided to universities in respect of hostels which were built before 1960 as it is felt that hostels built after 1960 have generally been done with the assistance of the University Grants Commission and contain requisite facilities for which assistance is now proposed to be given for older hostels.

28. Students Study - Homes - With a view to provide a congenial place and environment for studies, particularly in areas where there is a concentration of student population, assistance may be given to universities for putting up reading homes. A reading home may have arrangements for reading seats as well as a small library. It is proposed that during the Fourth Plan 50 reading homes may be set up through-out the country. For this an amount of Rs. 50 lakhs would be required.

29. Health Service - A Health Service Scheme on the lines recommended by the Committee set up by the University Grants Commission to formulate scheme of health service for staff and students in the universities and colleges under the Chairmanship of Dr. A.L. Mudaliar, Vice-Chancellor , Madras University would be initiated in some of the universities. It is proposed that an amount of Rs. 2 crores may be allocated for this scheme.

30. Sports and Games - During the Fourth Plan, it is proposed to give assistance to universities and colleges for providing facilities for sports and games to the students. An amount of Rs. 60 lakhs would be required for providing assistance to the universities and colleges as under:-

1. Rs. 20,000 for each university for 50 universities.	Rs. 10 lakhs
2. Rs. 10,000 for each college for 500 colleges	Rs. 50 lakhs
Total:	Rs. 60 lakhs

Thus, the total requirements for programmes of student welfare during the Fourth Plan period would be Rs. 4.10 crores or say Rs. 4.00 crores.

Residential facilities for Students & Teachers

31. Hostels - The University Grants Commission Committee on residential accommodation for students and teachers (1965) estimated that the cost of providing hostel accommodation to 25% of the students at the collegiate stage (against 18% in 1962-63) would be Rs. 120 crores. For obvious reasons, it is difficult to provide this amount out of the allocations likely to become available for higher education in the Fourth Plan. An ad hoc amount of Rs. 10 crores is proposed for the purpose.

32. Staff Quarters - The University Grants Commission Committee mentioned above estimated that the cost of providing residential accommodation to 50% of teachers would be Rs. 137 crores. Since then there has been an appreciable rise in the cost of construction as well as the number of teachers to be provided for in the Fourth Plan because of increase in the enrolment. Therefore, the cost calculated by the University Grants Commission Committee would need to be enhanced if the target proposed by the Committee has to be kept in tact. In view of the current financial constraints, this does not seem to be in the realm of possibility. In the Fourth Plan, an amount of Rs. 6 crores has been proposed for teachers' quarters and teachers' hostels.

Other Schemes of the U.G.C.

33. A sum of Rs. 3 crores has been provided for schemes like examination reform, research grants to individual research workers, utilisation of services of retired teachers etc.

Rural Higher Education

34. At present 14 rural institutes are working with an enrolment of about 4,000 in various courses. The National Council ofor Rural Higher Education has appointed a Committee to review the progress of the scheme of rural higher education and suggest ways and means for improving its working so that the objectives for which they were started may be achieved. Further expansion of the scheme will depend upon the Report of this Committee.

35. It is proposed that, subject to the recommendations made by the above mentioned Committee and the Government's decisions thereon, in the Fourth Plan, emphasis should be laid on the consolidation and improvement of facilities in rural higher education and any expansion of the scheme should be based on a careful assessment of the need for rural higher education in relation to manpower requirements for this category of personnel. It would be necessary to work out a perspective plan of development of rural higher education. The relationship of the rural institutes with the agricultural universities will also need to be clearly defined. A sum of Rs. 2.00 crores has been proposed for the scheme.

Other schemes of the Ministry of Education

36. An amount of Rs. 3 crores has been proposed for programmes of the Ministry of Education like Indian Institute of Advanced Study, Simla, Institute of Russian Studies, Grants to Voluntary Organisations etc.

Programme of Book Production

37. The need for organising a massive programme of book production for universities and colleges has been underlined in view of the national decision to change over to regional languages as media of instruction. The Ministry of Education has entered into agreements with the Government of U.S.A./U.K. and Soviet Union for the republication/translation of standard works of foreign origin in low priced editions. The translation of these works in regional languages and the production of regional works in those language will need to be taken up on big scale during the Fourth Plan. The Ministry of Education has worked out a comprehensive scheme for the production of books in regional languages for which a sum of Rs. 18 crores has been provided under the schemes relating to the development of modern Indian Languages. No separate provision, therefore, has been made under Higher Education.

Scholarships & Fellowships

38. The importance of a large scholarships programme to provide financial support to meritorous but needy university students can hardly be over-emphasised. The Ministry of Education has launched a number of scholarship schemes for post-matriculation studies. The University Grants Commission also provides Fellowships and Research Scholarships to promising students.

39. It is proposed to work out a comprehensive scheme of Scholarships and Fellowships covering both secondary and higher education stages for implementation in the Fourth Plan. It has been suggested that the number of scholarships during the Fourth Plan should be twice as much as at present. The emphasis will be on loan scholarships so that, in course of time, a self revolving fund may be created. It is also proposed to establish an autonomous organisations for the administration of scholarship programmes. As suggested in the Draft Outline: "The organisation will coordinate the various scholarships programmes in the country. It will receive funds from the Government as well as donations from the public. It will follow up the educational carreers of scholars and offer them the necessary guidance from time to time. It is felt that the new organisation will have the necessary flexibility and speed, as well as prestige to act as the focus of national endeavour in this important field".

In the Fourth Plan, an amount of Rs. 40 crores has been provided for the purpose. This includes Rs. 5 crores for University Grants Commission's fellowship and Research Scholarships including National Integration Scholarships and Rs. 35 crores for the programmes of the Ministry of Education.

Outlays

40. The above proposals along with their financial provisions have been summarised in table 2 in the enclosed statement. The total cost of higher education has been estimated as Rs. 255 crores, which may be distributed as follows:

	(Rs. crores)
Ministry of Education	41.50
University Grants Commission	131.12
State Governments	82.80
Total:	255.42

41. A list of schemes indicating proposed Fourth Plan Outlays is given in Table 2.

Table 2. Outlays for Higher Education

(Rs. lakhs)

Sl. No.	Scheme	Total	Centre		States
			Ministry of Education	U.G.C.	
1.	2.	3.	4.	5.	6.
1.	Additional enrolment and expansion of facilities: Arts, Science, Commerce courses:				
	Expansion Programmes:				
	i) Under-graduate education	7119	-	2000	5119
	ii) Post-graduate Education	4000	-	4000	-
	iii) Cost of improvement of existing institutions	1200	-	600	600
	iv) Correspondence courses	150	-	150	-
2.	Science Education:				
	i) Provision of equipment, laboratory, buildings, and libraries for additional enrolment	1823		912	911
	ii) Short-term courses in applied science	100-	-	100	-
	iii) Development of workshops	300		300	-
	iv) Basic research work for industrial development	50	-	50	-
		2273			
3.	Centres for advanced study and research in university	1500	-	1500	-
4.	New Universities/University Centres	1500	100	700	700
5.	Special assistance to selected colleges	300	-	300	-

1.	2.	3.	4.	5.	6.
6.	Expansion and improvement of legal education	300		200	100
7.	Summer Institutes/Seminars	400		400	
8.	Student Welfare Services	400		200	200
9.	Hostels	1000	50	500	450
10.	Staff Quarters(including Teachers Homes)	600		400	200
11.	Other Schemes of U.G.C.	300	-	300	-
12.	Scholarships and Fellowships	4000	3500	500	-
13.	Other Schemes of Ministry of Education	300	300	-	-
14.	Rural Higher Education	200	200	-	-
	Grand Total:	25542 Rs. or say Rs. 255 crores	4150	13112	3280

ENROLMENT IN ARTS, SCIENCE AND COMMERCE AT HIGHER EDUCATION STAGE DURING THE FOURTH FIVE YEAR PLAN

A number of statistical techniques can be employed to project the enrolment at the higher education stage. The methodology commonly utilised includes (i) Projections on the basis of observed trends in the growth rate over a fairly long period; (ii) establishing relationship between the outturn from the Second Level institutions and the potential entrants to universities and colleges and (iii) computing 'transfer ratios' of the number of students at the school stage and the college stage after the lapse of the specified period. In view of the significant changes in school enrolments in the recent past, any method of projection which does not take account of these changes cannot be relied upon. Therefore, in this note an attempt has been made to estimate the enrolments at higher education stage on the basis of the method mentioned at (iii) above.

2. During the later half of the third Plan and the last three years there has been phenomenal increase in the enrolments at higher education. This has been due mainly to three factors:

(i) Transfer of one year from Intermediate to under graduate stage.

(ii) Accelerated programmes of expansion at school stage which resulted in bigger supply of students for higher education.

(iii) Desire of a larger proportion of students for continuing higher education or to put in other words - an improvement in transfer ratio from schools to colleges.

3. So far as first factor is concerned, the position has more or less stablised by now. Except for a few universities in U.P. and Western Maharashtra, all the universities have changed over to three year degree course. As there is no likelihood of these universities changing over to three year degree course in the near future, no major change is expected in enrolments at under-graduate or post-graduate stages on account of structural changes. Similarly, the enrolments at Pre-university have also more or less stablised and we can expect a smooth growth.

4. The second factor is the most important of all and it influences the enrolments at higher education to a great extent because enrolment say at under-graduate stage in any year depends on the cohort of students at secondary stage or middle stage 3 years or 6 years earlier. Therefore a rise or a fall in rate of growth in enrolment at middle or secondary stage will effect the enrolments at higher stage. It is an admitted fact that the rate of increase in enrolment at any stage can not go on rising indefinitely. After touching the highest point it has to come down and ultimately it will be equal to the rate of growth in population of the corresponding age group in case no deliberate policy of restriction or acceleration of enrolment is adopted. A bulge in rate of growth in enrolment at primary stage occured in the Second Plan, a similar phenomenon occured at secondary stage during the Third Plan. The rate of increase at middle stage touched its highest during the year 1961-62 (11.1%), thereafter it started declining.- 10 per cent each in the years 1962-63, 1963-64 and about 6 per cent in 1964-65 and 1965-66. On the basis of this shift in the feeder enrolments, it is expected that the rate of increase in enrolments at Pre-university and under-graduate stages will be at the peak during the years 1967-68 to 1969-70 and thereafter it will start declining. The rate of increase in enrolment at Post-graduate stage will however continue to rise during the Fourth Plan. It will start declining from 5th Plan onwards.

5. The third factor works in the direction of increasing the enrolments and it is expected that with the implementation of qualitative programmes as envisaged in the Fourth Plan, the rate of wastage will decline and the transfer ratio from schools to higher education will improve.

6. Thus so far as enrolments at higher education are concerned, two forces in opposite direction will work during the Fourth Plan. Firstly the reduction in the rate of growth in the feeder cohorts and secondly the improvement in transfer ratio. As the former has a dominant influence, it is expected that the rate of growth in enrolment at higher education shall start declining from the year 1970-71 onwards.

Enrolments at under-graduate stage

7. The available statistics for the enrolment at undergraduate stage in the past are not comparable on account of structural changes and changes in classification from time to time. The statistics upto the year 1959-60, pertain to only 2 year degree course (except Delhi).

Thereafter these pertain to 3 years in some of the States and 2 years in other States and sometimes in the same State these pertain to both, two year degree course and three year degree courses. As such, these cannot be related to the corresponding enrolments at school stage a few years earlier. In order to overcome this difficulty, the statistics for the enrolment at under-graduate stage have been re-classified by adding the enrolments in intermediate 2nd year or in class XII which are equivalent to Ist year of 3 year degree course. The reclassified enrolment in classes XII, XIII and XIV (final year of first degree) are given in col.5 of table I. These have been related to enrolments at middle* stage classes VI-VIII as given in col.(2) of table 1 with lag of 6 years. It will be seen from the col. (6) that the rate of transfer from the classes VI-VIII to classes XII-XIV has been quite steady and during the 14 years 1955-56 to 1968-69 , it increased from 12.7 per cent to 14.5 per cent. This shows an improvement of about 0.1 per cent per year. On this basis the improvement in transfer ratio during the Fourth Plan could be about 0.3 per cent, but on account of qualitative programmes and restriction in admissions to technical education (this will to some extent increase the enrolments in general education), there are changes of a further improvement in transfer ratio and it has been assumed to be about 0.2 per cent per year during the Fourth Five Year Plan.

---

* The enrolments at middle stage and not at secondary stage have been used on account of the following two reasons:-

i) The pattern of secondary education is not uniform throughout the country. The enrolment in class XI relates to final year of matriculation in some States and in other States it relates to final year of higher secondary stage.

ii) To find the enrolment at under-graduate stage during the year 1973-74 if enrolment at secondary stage are used we shall require enrolments at secondary stage during the year 1970-71 which is not known at present. But if enrolments at middle stage are used we shall require enrolment in classes VI-VIII during the year 1967-68 which is known.

Table I. Enrolment at Under-graduate [illegible] Science and Commerce 1949-50 to 1968-69

Year	Enrolment in classes (000's)				Col. 5 as % of [illegible] with [illegible] of 6 years
	VI-VIII	Classes XII, XIII & XIV			
		Under-graduate	Class XII	Total	
1	2	[illegible]		5	6
1949-50	2,844	-	-	-	
50-51	3,120	101	105	206	
51-52	3,388	115	114	229	
52-53	3,567	129	135	264	
53-54	3,829	143	148	291	
54-55	4,048	157	[illegible]	330	
55-56	4,293	169	193	362	12.[illegible]
Rate of growth per First Plan	6.6	-	-	11.9	
56-57	4,637	200	1[illegible]9	399	12.[illegible]
57-58	4,928	277	196	425	12.[illegible]
58-59	5,441	260	198	458	12.[illegible]
59-60	6,052	294	204	498	[illegible]
60-61	6,705	348	170	518	[illegible]
Rate of growth per year Second Plan	9.3	-	-	7.4	
61-62	7,470	428	157	585	[illegible]
62-63	8,221	493	114	607	[illegible]
63-64	9,039	559	119	678	[illegible]
64-65	9,915	640	125	765	[illegible]
65-66	10,346	721	139	860	[illegible]
Rate of growth per year Third Plan	9.0	-	-	10.7	
66-67	10,990	805	153	958	[illegible]
67-68	11,842	907	168	1,075	[illegible]
68-69	12,701	1,007	185	1,192	[illegible]
Rate of growth per Year	7.1	-	-	11.5	

8. The enrolments calculated on this basis in classes XII-XIV during the Fourth Plan are given in Col.5 of table II.

Table II. Enrolment at under-graduate stage Arts, Science, and Commerce 1969-70 to 1973-74

Enrolment in Classes VI-VIII		Rate of	Enrolment in classes XII-XIV		Enrol-	Enrolment at under-
Year	Enrol- ment	trans- fer	Year	Enrol- ment	ment in Class XII	graduate stage (Col.5 - Col.6)
1	2	3	4	5	6.	7
	(000's)	%		(000's)	(000's)	(000's)
1963-64	9,039	14.6	69-70	1,320	202	1,118
1964-65	9,915	14.8	70-71	1,467	220	1,247
1965-66	10,346	15.0	71-72	1,552	240	1,312
1966-67	10,990	15.2	72-73	1,670	261	1,409
1967-68	11,842	15.4	73-74	1,824	284	1,340

From these, the projected enrolments in class XII of intermediate (including U.P. Board) have been deducted and the resultant enrolments at under-graduate stage are given in col.7 of table II. This gives an increase of about 533 thousands (1540-1007) during the Fourth Five Year Plan, or a rate of increase of about 9 per cent per year.

Enrolments at post-graduate and Research

9. The enrolments at post-graduate and research have been estimated by taking into consideration the enrolments in classes XIII-XIV and the transfer rate from a lag of 5 years.

Table III. Enrolment at Post-graduate and Research in Arts Science and Commerce 1950-51 to 1968-69.

Year	Enrolments (000's)		
	XII, XIII, XIV	Post-graduate and Research	Col.(3) as % of 2 with lag of 3 years
1	2	3	4
1950-51	206	20	
1951-52	229	22	
1952-53	264	23	
1953-54	291	26	12.6
1954-55	330	28	12.5
1955-56	362	31	11.6
Rate of growth per year during First Plan	11.9	9.2	
1956-57	399	3[illegible]	11.3
1957-58	423	3[illegible]	11.4
1958-59	458	4[illegible]	12.5
1959-60	498	52	12.9
1960-61	518	58	13.6
Rate of growth per year during Second Plan	7.4	13.3	
1961-62	585	66	14.5
1962-63	607	69	13.8
1963-64	678	73	14.1
1964-65	763	80	13.7
1965-66	860	89	14.6
Rate of growth per year during Third Plan	10.7	8.9	
1966-67	958	98	14.4
1967-68	1075	110	14.4
1968-69	1192	124	14.4
Rate of growth per year	11.5	11.7	

It will be seen from Col.4 of table III that during the past 16 years 1953-54 to 1968-69 the proportion has improved by 1.8 per cent from 12.6 to 14.4. The improvement in the later years has been even slower, but it is expected during the Fourth Plan, this proportion will improve and will increase by 0.2 per cent per annum. On this basis the expected enrolments at post graduate and research are given in table IV below:-

Table IV. Enrolment in Arts, Science and Commerce at Post-graduate and Research during Fourth Five Year Plan

Enrolment in classes XII-XIV		Transfer ratio	Enrolment at Post-graduate and Research	
Year	Enrolment in (000's)		Year	Enrolment in (000's)
1.	2.	3.	4.	5.
1966-67	958	14.4	1969-70	153
1967-68	1075	14.6	1970-71	157
1968-69	1132	14.8	1971-72	175
1969-70	1320	15.0	1972-73	198
1970-71	1467	15.2	1973-74	225

It will be seen from col.5 of table 4 that the enrolment will increase by 99 thousands (223-124). This gives an average annual growth rate of about 12.5 per cent.

Enrolments at Intermediate and Pre-University Stages

10. The enrolments at intermediate stage excluding U.P. Board and pre-university are estimated to be about 50 thousands and 512 thousands during the year 1968-69. These are assumed to rise at about 9 per cent per annum (these cannot rise at a faster rate than enrolments at undergraduate stage). This will give an additional enrolment of about 278 thousands at pre-university stage and about 27 thousands at Intermediate stage.

Total enrolments at higher education (Arts, Science and Commerce

11. Table 5 below gives the consolidated picture of growth of enrolments at various levels of education. It will increase from 1693 thousands in the year 1968-69 to about 2628 thousands in the year 1973-74 giving an additional enrolment of about 935 thousands during the Fourth Five Year Plan.

Table 7. Enrolments in Arts, Science and Commerce at higher education stage during Fourth Five Year Plan.

Stage of Education	Year (000's)						
	1968-69	1969-70	1970-71	1971-72	1972-73	1973-74	Addl. enrolments Fourth Plan
1	2	3	4	5	6	7	8
Pre-University	512	558	608	663	725	788	276
Intermediate (other than U.P. Board)	50	55	60	65	71	77	27
Under-graduate	1007	1118	1247	1312	1409	1540	533
Post-graduate and Research	124	138	157	176	198	223	99
Total	1693	1869	2072	2216	2401	2628	935

Enrolment in Correspondence Courses

12. It is expected that about 55 thousand students out of the above enrolments and another 15 thousand students (who for various reasons would not have continued higher education otherwise) will join the correspondence course.

Enrolment in University Teaching Departments

13. Of the total enrolment in Arts, Science and Commerce at higher education, about 11.7 per cent was in university teaching departments in the year 1965-66. It is assumed that this percentage will be about 12.0 per cent during the Fourth Plan. This shows that out of total additional enrolment of 9 lakhs in full time course about 108 thousands will be in university teaching departments and the rest in affiliated colleges.

Enrolment in Evening Colleges

14. The enrolment in evening colleges was about 45 thousand during the year 1963-64. It is expected to rise to about 1 lakh during the Fourth Plan.

Enrolment in Science Courses

15. At present about 40 per cent of total enrolment is in science courses. This is expected to imorove to about 45 per cent. This gives an additional enrolment of about 405 thousands in science courses during the Fourth Five Year Plan.

AVERAGE ANNUAL COST PER STUDENT IN ARTS, SCIENCE AND COMMERCE COURSES IN UNIVERSITY TEACHING DEPARTMENTS & AFFILIATED COLLEGES DURING THE FOURTH FIVE YEAR PLAN.

The major portion of expenditure on higher education during the Fourth Five Year Plan will be on expansion programmes and on qualitative improvements in facilities for the existing and the additional enrolments. It is, therefore, very essential to estimate cost per student at various levels of education during the year 1968-69. The latest available statistics on cost per student at higher education level relate to the year 1963-64. Obviously these figures cannot be adopted for the Fourth Five Year Plan. It is also not possible to calculate on the basis of these figures the level of expenditure per student in the year 1968-69 on account of the following reasons:-

(i) The available data for the past is only at current prices. In the absence of proper indices for rise in cost, the average annual cost in 1968-69 cannot be found out on the basis of existing data.

(ii) After the year 1964 there have been considerable changes in the salary scales and dearness allowance rates paid to teachers. No precise information on this is available.

2. On account of these reasons the recurring cost per student during the Fourth Five Year Plan has been calculated on the basis of teacher cost and its proportion to total recurring cost. For teacher cost the salary scales as recommended by the University Grants Commission and dearness allowance rates as applicable to Central Government employees have been taken into account. The pupil-teacher ratio in university teaching departments has been taken as 15:1 and in colleges 22 : 1. It is further assumed that the distribution of teacher into various categories such as professors, readers, lecturers etc. for the additional enrolment during the Fourth Five Year Plan would be same as it existed in the year 1965-66.

Cost per student in university teaching departments.

3. Table 1 below gives the scales of pay, average pay per teacher during the Fourth Plan, dearness allowance and total emoluments per teacher per year for different categories of teachers in university teaching departments.

Table 1. **Average annual cost per teacher in University Teaching Departments.**

Category of Teacher	Scale of Pay	Average pay per teacher during Fourth Plan.	Addl.10% D.A. for Provident Fund & other benefits		Total emoluments per month	Total emolument pe year
1.	2.	3.	4.	5.	6.	7.
Professor (Sr. Grade)	1600-1800	1700	170	100	1970	23,640
Professor	1100-50-1600	1250	125	100	1475	17,700
Reader	700-5-1250	850	85	100	1035	12,420
Lecturer	400-40-800-50-950	520	52	153	725	8,700
Tutor/Demonstrator	250-15-400	300	30	137	467	5,604

The total emoluments per teacher given in Col.7 for different categories of teachers have been weighed with the proportion of teachers in that category as it existed in the year 1965-66 in university teaching departments.

Table 2 below gives the average annual cost per unit of teacher on account of emoluments to teachers:

Table 2. Average Annual Cost per Teacher Unit in University Teaching Department.

Category of Teacher	Averagge emoluments per year	Weight	Total emoluments
1.	2.	3.	4.
Professor (Sr. Grade)	23640	0.0265	626
Professor	17700	0.0529	936
Reader	12420	0.1786	2218
Lecturer	8700	0.6850	5960
Tutor/Demonstrator	5604	0.0570	319
Total	-	1.0000	10059

4. On the basis of previous records it is assumed that the cost on account of salaries of teachers per teacher unit will form about 55% of the total recurring cost. Thus total recurring cost per teacher unit will be Rs. 18289 $(\frac{10059 \times 100}{55})$.

This cost will be for 15 students. Therefore, the cost per student per annum will be Rs. 1219 $(\frac{18289}{15})$. It is further assumed that Government will bear 80% of this cost.

5. Table 3 gives the scales of pay, average pay per teacher during the Fourth Plan, D.A. and total emoluments per teacher per year for various categories of teachers in affiliated colleges.

Table 3. Average annual cost per teacher in affiliated colleges for Arts, Science and Commerce.

Category of Teacher	Scale of pay	Average pay per teacher during Fourth Plan.	Add 10% for Provident Fund and other benefits	D.A.	Total emoluments per month	Total emoluments per year
1.	2.	3.	4.	5.	6.	7.
	Rs	Rs	Rs	Rs	Rs	Rs
Principal/Sr. Lecturer	700-40-1100	820	82	100	1002	12024
Lecturer	300-25-600	375	37	153	565	6780
Demonstrator	250-15-400	300	30	137	467	5604

6. The total emoluments per teacher given in col.7 for various categories of teachers have been weighed with the proportion of teachers in that category in affiliated colleges as it existed in the year 1965-66.

Table 4. Average Annual Teacher Cost Per Teacher Unit in Affiliated Colleges.

Category of Teacher	Average emoluments per year	Weight	Total emoluments.
1.	2.	3.	4.
	Rs.		Rs.
Senior Lecturer	12024	0.1241	1492
Lecturer	6780	0.7558	5124
Demonstrators	5604	0.1201	673
Total	-	1.0000	7289

7. It is assumed that this cost will form about 65% of the total recurring cost in affiliated colleges per teacher unit. Thus total recurring cost per teacher unit will be Rs.11214 $(\frac{7289 \times 100}{65})$. This cost will be for 22 students. Therefore, the cost per student per annum will be Rs. 510 $(\frac{11214}{22})$ It is further assumed that Government would bear 50% of this cost. The Corresponding Percentages in the years 1961 and 1962 were 39.3 and 40.7 respectively.

ANNEXURE VI

PLANNING COMMISSION
(Education Division)

Teacher Education in the Fourth Plan

Introduction

An important sector of post-secondary education is the training of teachers for elementary as well as secondary schools. The Education Commission have spelt out various programmes of improvement and development of teacher education. Taking into consideration the role which teacher education has to play in the reorientation of the education system, the following approach in this field is proposed:-

(a) A detailed plan of teacher requirements and teacher training - both pre-service and in-service- may be drawn up.

(b) Where expansion is called for, it may preferably be given through the expansion of existing institutions instead of opening new ones. In some cases, it may be necessary to combine a number of small institutions into bigger and viable units.

(c) The quality of training institutions will need special attention. A phased programme for removing deficiencies in respect of buildings, hostels, equipment etc. in existing institutions may be drawn up. The methods of teaching and evaluation in the training institutions need to be carefully reviewed. Material useful for teachers could be brought out with the assistance, where necessary, of the N.C.E.R.&T., in the regional languages.

(d) For in-service training - to which very high priority needs to be attached - all training institutions may have extension wings for imparting refresher courses.

(e) The help of the universities could be enlisted in training programmes, especially of science and mathematics teachers.

(f) The backlog of untrained teachers and the up-dating of trained teachers may be accomplished through the organisation of correspondence courses, especially in conjunction with summer Institutes.

(g) Training facilities for teacher educators need to be provided on high priority basis.

(h) The formulation and implementation of plans in regard to teacher training may be facilitated if State Boards of Teacher Education, as suggested by Education Commission, are established.

An attempt has been made to work out details of teacher education programmes in the light of the above approach. It is estimated that outlays required to implement these programmes would be Rs. 120 crores as shown in Statement I. In the Draft Outline of the Fourth Plan, the outlay provided for Teacher Education was Rs. 92 crores as shown in Statement II.

Expansion of Schooling facilities in the Fourth Plan

2. It has been decided that the targets of additional enrolment, in the Fourth Plan, in various classes would be as under:

(a) Classes I-V = 180 lakhs
(b) Classes VI-VIII = 70 lakhs (10 lakhs through continuation courses)
(c) Classes IX-XI = 33 lakhs

Thus the total enrolment in various stages of education, by the end of Fourth Plan, is shown in Table I.

Table I: Enrolment in various classes in 1968-69 and 1973-74

(in lakhs)

Classes	Position in 1968-69	Additional enrolment in 1969-74	Total enrolment in 1973-74
1.	2.	3.	4.
I-V	567	180	747
VI-VIII	120	70*	190
IX-XI	64	33	97
Total:	751	283	1034

* 10 lakhs students will be enrolled in continuation classes.

During the Fourth Plan additional 283 lakhs children would be enrolled in various classes raising the total enrolment to 1034 lakhs in 1973-74.

Requirements of additional teachers

3. It has also been agr ed that the teacher-pupil ratio by 1973-74 in primary, middle and secondary classes should be 1: 45, 1:30 and 1:25 respectively. On the basis of these ratios, the number of teachers, who would be in position by the end of the Fourth Plan, is indicated in Table 2. Table 2 also indicates the number of additional teachers who will have to be appointed asaresult of (a) expansion of schooling facilities and (b) normal replacement.

Table 2: Additional Employment of Teachers in the Fourth Plan

(Figures in lakhs)

Stage	1965-66 (as per Second Educational Survey)	1968-69	1973-74	1969-74 (Additional Teachers) (Col.4-Col.3)	1969-74 (Additional teachers for normal replacement)	Total Additional Teachers (Col.5+ Col.6)
1.	2.	3.	4.	5.	6.	7.
Primary	11.96	14.20	16.60	2.40	2.30	4.70
Middle	4.36	5.20	6.00*	0.80	0.90	1.70
Secondary	2.77	2.90	3.90	1.00	0.60	1.60
Total:	19.09	22.30	26.50	4.20	3.80	8.00

* Excludes teachers who will be required for 10 lakh students to be enrolled in continuation classes. The existing teachers will be required to teach these students.

The requirements of additional teacher during the Fourth Plan is expected to be 8.0 lakhs.

State-wise requirements of teachers

4. The expansion of training facilities will have to be worked out separately for individual States and Union Territories in relation to enrolment targets and the existing capacity in training institutions. Further the training programme will have to be phased according to the additional enrolment visualised for each year. An attempt will have to be made to match the out-turn from training institutions with the annual requirements of teachers. In fact, detailed calculations of subject-teachers, for each of the States, will have to be worked out and expansion of training programmes phased appropriately. In this connection, drawing up of a perspective plan of teacher education cannot be over-emphasised. For calculating cost etc. an attempt has, however, been made to work out the overall requirements of teachers and also the need for expansion of training facilities.

Training Facilities

5. In 1967-68, the enrolment of teachers' training colleges and training schools was 34,320 and 1.69 lakhs respectively. The total facilities were available for training training 2.03 lakh teachers; 34,320 for degree courses and 1.69 lakhs for diploma/certificate course. The annual out-turn of teachers with Degree and Diploma/ Certificate in Teaching, is expected to be 29,000 and 1.12 lakh respectively in 1967-68. The position in 1968-69 is likely to be different. In fact, a number of States have closed down some of their training institutions because of lack of employment opportunities for teachers. It is expected that, in 1968-69 training facilities may be available for 33,000 and 1.50 lakh in Training Colleges and Training Schools respectively. The annual out-turn of training colleges and training schools is expected to be 28,000 and 1 lakh respectively. Thus over a period of five year, the number of trained teachers, with Degree and Diploma/Certificate qualifications, who would be available, may be 1.4 lakh and 5 lakh respectively.

6. The number of additional elementary school teachers(reference Table 2), who will be required during the Fourth Plan, as a result of expansion and normal replacement would be 4.70 lakh and 1.70 lakh respectively or 6.40 lakh. Out of these about 1 lakh teachers would be with Graduate/post-graduate qualifications and the rest, i.e. 5.4 lakh teachers will be with matriculation and equivalent qualifications. (Reference Table 2). The out-turn from existing institutions is likely

to be 5.00 lakh matric trained teachers. Thus additional training facilities for 40,000 teachers will have to be arranged in training schools, if the assumption is that all new teachers to be appointed during the Fourth Plan should be trained. The requirements of science and other subject teachers will be about 20,000 and appropriate training programmes will be arranged for them. In this connection, attention is drawn to para 13(v) of Annexure I Elementary Education Programmes in the Fourth Plan.

7. The number of additional secondary school teachers, who will be required, during the Fourth Plan, as a result of expansion and normal replacement, would be 1.60 lakh. To this will have to be added the number of graduate teachers required for elementary schools whose number, as estimated in para 6 above, would be 1 lakh. The out-turn from existing institutions is likely to be 1.4 lakh trained teachers as against the requirements of 2.6 lakh teachers. Thus, additional training facilities for 1.2 lakh teachers will have to be arranged the assumption being that all new teachers to be appointed during the Fourth Plan should be trained.

Accent on Training of Science Teachers

8. According to the present pattern of admissions in Training Colleges, only 21% of the candidates have a science degree which means that, on an average 4,200 science teachers with B.Ed. or B.T. Degree become annually available or 21,000 trained science teachers would be available out of the total out-turn of 1.4 lakh during the Fourth Plan. It is estimated that the actual requirements of science teachers, during the Fourth Plan, would be 80,000 or so out of 2.6 lakh teachers. This indicates that the pattern of admissions in training colleges will have to be diversified with greater emphasis on the admission of science graduates so that the requisite number of trained science teachers become available.

9. It has been observed that in number of States, there are many trained unemployed teachers. One of the important reasons for this is that educational institutions do not appoint trained teachers. It would be necessary to mdoify the grants-in-aid code in a suitable manner so that it is obligatory for managements to appoint only trained and qualified teachers. Unless this is done, it may not be advisable to expand the training facilities as recommended in paras 6 and 7 above.

Correspondence Courses for Untrained Teachers

10. Even though training facilities have expanded during the last 17 years, they have not kept pace with the number of additional teachers appointed to cater to additional enrolment. As a consequence, the number

of untrained teachers has grown. Table 3 indicates the position in this regard for the year 1967-68.

Table 3: Untrained Teachers in 1967-68

(Figures in lakhs)

	Trained Teachers	Untrained Teachers	Total	Percentage of untrained teachers
1.	2.	3.	4.	5.
Elementary School -Teachers	11.73	3.84	15.57	25
Secondary School Teachers	3.46	1.44	4.90	29
Total:	15.19	5.28	20.47	26

At the end of 1967-68, the total number of untrained teachers was 5.28 lakhs (26 per cent); 3.84 lakhs (25 per cent) in elementary schools and 1.44 lakh (29 per cent) in secondary schools. The position is not likely to change in 1968-69.

11. According to the Second All India Educational Survey, out of the total number of 19.09 lakh teachers in 1965-66, the number of untrained teachers was 5.06 lakh; 3.15 lakh teachers in primary schools, 1.08 lakh in middle sections and 84,000 in secondary sections.

Untrained Elementary School Teachers

12. Out of 3.15 lakh of untrained teachers in primary sections, 2.43 lakh teachers had teaching experience of 8 years and less, 1.8 lakhs teachers had teaching experience of 4 years and less. Out of 1.08 lakh untrained teachers in middle sections, 84,126 teachers had 8 years or less of experience. The number of teachers, whose teaching experience was less than 4 years was 64,000. The total number of untrained elementary school teachers with teaching experience of 4 years and less in 1965-66 was 2.44 lakhs (1.8 lakh plus 64,000).

13. Since experience in regard to the organisation of the correspondence course for elementary school teachers, many of whom are not even academically qualified, is not available, it may be desirable to concentrate on the training of about 2.44 lakh of untrained teachers, who may have put in 4 years or less of service, through correspondence courses, in the Fourth Plan. This problem is mainly acute in the States of Assam, West Bengal, Orissa, Mysore and Jammu & Kashmir where there is a large concentration of untrained teachers. The State Institutes of Education and other appropriate organisations will have to prepare a phased programme of clearing this backlog of untrained teachers.

Untrained Secondary School Teachers

14. According to the Second All India Educational Survey, out of 84,387 untrained teachers working in Secondary sections, 67,818 teachers had teaching experience of 8 years and less and out of these 52,750 untrained teachers had teaching experience of 4 years and less. The position may have slightly improved by now. The problem is, however, concentrated in Assam, Bihar, Jammu & Kashmir, Mysore, Nagaland, Orissa, Rajasthan and West Bengal. In the Fourth Plan, the target may be to train 50,000 teachers through correspondence courses in four Regional Colleges of Education and the Central Institute of Education who have the experience of running these courses.

In-service Programme

15. Continuous retraining and refreshing of teachers of various subject specialists in methods of teaching and professional knowledge is essential because of the growing obsolescence. For instance, the Second All India Educational Survey indicated that about 65,000 teachers or about 23.4 per cent of the total teaching force working in secondary sections are science teachers. Only 31.2 per cent of them possess the prescribed qualifications of a science degree with professional teacher training qualifications.

It would be necessary to draw up a regular programme of in-service training and education of teachers, through correspondence, week-end, and other short-term courses in order to provide them an opportunity to keep abreast of latest developments. Such in-service training programme will have to be provided by the existing teacher education institutions through their extension service departments and State Institutes of Education, Science Institutes and Summer Institutes. These Departments will have to be strengthened to take up this work. The in-service programmes will have to be arranged at the district level so that the coverage is large. With a view to enabling selected primary schools teachers to teach new courses of general science, teachers of 21,000 primary schools (where science kits will be provided), will be trained throughaa two-month in-service programme in 700 selected neighbourhood secondary school and training schools. There are at present about 90,000 middle schools, where science is taught as an integrated course of general science. In order to train the existing teachers of these schools to teach science course as individual disciplines of physics, chemistry, mathematics and biology, a two-month in-service training course will be organised through selected teacher training colleges. During the Plan period, about 40,000 teachers will be trained. During the Fourth Plan, 5 lakh teachers (4 lakh elementary school teachers and 1 lakh secondary teachers including 1.25 lakh science teachers) may be provided in-service training programmes.

Improvement of Training Institutions

16. The Education Commission has observed that most of the teacher training institutions have substantial deficiencies in regard to equipment, buildings and other facilities esepially craft sheds, craft equipment, laboratories and libraries. A number of training institutions are under private management and in most cases, the managements do not have enough funds for providing the necessary facilities. During the Fourth Plan, both recurring and non-recurring expenditure, will have to be provided to training institutions to improve these facilities including science laboratories, to increase the number and value of stipends of student teachers and provide incentives to teacher educators for improving their qualifications. Non-recurring funds will be utilised mainly for providing, in order of priority, laboratory, library, audio-visual and workshop equipment, minimum hostel facilities and staff quarters. It should also be possible to select about 10 per cent of such institutions hand to develop them as peaks of excellence.

17. There are about 1400 training schools in the country. A number of them are small-sized and, therefore, uneconomic. It would be desirable to concentrate on developing large-sized institutions by amalgamating the existing institutions and providing additional physical facilities. There are about 220 training colleges/university departments of Education. In the Fourth Plan, about 150 Training Colleges/University Departments of Education will be selected to develop as comprehensive colleges with multi-faculty training programmes. Norms will be laid down in respect of the staff and various physical facilities. The institutions selected for the purpose could be enabled to develop a minimum prescribed level.

18. From the point of view of general qualifications, school teachers in India range from these who have not completed the middle school course to those possessing post-graduate degrees. Table 4 brings out the position about the educational status of teachers in 1965-66 according to the Second All India Educational Survey.

Table 4. Educational Status of Teachers - 1965-66.

Qualifications	Teachers in primary Sections	Teachers in Middle Sections	Teachers in Secondary Sections	Total
1.	2.	3.	4.	5.
1. Below Middle pass	22,907 (1.9)	57,085 (13.1)	871	22,907 (1.2)
2. Middle pass	5,94,354 (49.7)			
3. Matriculate	4,93,682 (41.3)	2,16,429 (49.7)	24,247 (8.7)	7,34,358 (38.4)
4. Intermediate	55,505 (4.6)	51,560 (11.8)	14,546 (5.2)	1,21,611 (6.4)
5. Graduate	16,618 (1.4)	65,025 (2.5)	1,51,649 (20.7)	2,33,292 (23.6)
6. Others*	11,752 (1.0)	34,741 (8.0)	28,471 (10.3)	74,964 (3.3)
Total:	11,96,111 (100.0)	4,35,939 (100.0)	2,77,137 (100.0)	12,09,187

Figures within parantheses indicate percentage.

* Teachers of music, craft and physical education.

Of the total number of teachers employed in schools in India during 1965-66, according to the Second All India Educational Survey, 22,907 (1.2%) were teachers with less than middle pass educational qualifications. There were 6,52,310 teachers (34.2%) who did not have the matriculation certificate. The number of teachers, who had passed matriculation examination, was 7,34,358 (38.4%), 1,21,611 (6.4%) were Intermediates and only 3,03,037 teachers (15.9%) had graduate and post-graduate qualifications. It may be noted that teachers who are matriculate or less, constituted the bulk of teachers namely 73.8 per cent of the total teacher population in the country.

19. The Education Commission, after analysing the growth of qualified teachers over the period 1951-66, observed that the number of unqualified teachers is being reduced very slowly. The Commission observed that, at the present rate, it may take 20-25 years to ensure that every teacher has had at least 10 years of general education. If the quality of education is to be improved, the qualifications of unqualified and under-qualified teachers will have to be upgraded. This can be done through a big programme of correspondence courses/morning and evening courses. This programme would involve, among other things:-

(a) giving study leave to teachers for short durations;

(b) linking the increase in emoluments with improvement in qualifications; and

(c) appointment of teachers in leave reserve who could releive the teachers going on study leave.

Professional Advancement of Teacher Educators

20. The staffs of training institutions, whose number is estimated to be about 15,000 or so are inadequately prepared for their tasks. For instance, 40 per cent of the staff in secondary training colleges have only B.A. degree in addition to the B.Ed; 58 per cent hold a Master's degree in Education or in an academic subject; and only 2 per cent have a Doctoral degree.

21. The conditions of training institutions for primary teachers is very depressing and their standards even more unsatisfactory than those of secondary training institutions. The majority of the staff is recruited from among teachers of secondary schools. These have been trained for the work at the secondary stage and are, in consequence, inadequately trained for preparing teachers for primary schools.

22. The Education Commission have recommended that the staff of the training colleges should have a double master's degree in an academic subject and in Education, and a fair

proportion, say 10 per cent, should also have a doctorate. They should also have studied Teacher Education as a special subject at the M.Ed. or through special education course. In regard to the staff of training schools, the Education Commission have recommended that they should have, besides the B.A. degree, a Master's degree either in Education or in an academic subject and should be entitled to receive the same scale of salary as lecturers in arts and science colleges and two advance increments, in recognition of the professional training. The following programmes will have to be taken up:-

1. Provision of further education, research and doctoral courses for the existing staff of training institutions in University Departments of Education/Schools of Education and other appropriate Teacher Education Institutes.

2. Training of qualified people as Teacher Educators by providing additional facilities in University Departments of Education/Schools of Education etc.

3. Provision for the appointment of additional staff in teacher education institutes as leave reserve to replace staff going in for higher education.

4. Provision for leave salary and Fellowships for teacher educators going in for further education and for entrants to training institutions.

5. Strengthening of University Departments of Education/School of Education for providing specialised courses.

Educational Research

23. The quality of educational research is small and its quality is also poor. There are inadequate facilities for research in training colleges and also there are a few competent people to guide it. Ancillary services like documentation, computation have not been developed. There is not a single journal exclusively devoted to educational research. There is no general clearing house and as such there has been considerable duplication of work. The Education Commission have suggested that the setting up of a documentation centre and a National clearing house in educational research. Further, it has also been suggested that educational research in teams and in inter-disciplinary fields should be developed. In order to make research functional, it has been suggested that officers of the Education Department, working in the field, should be brought together with research workers in the training colleges and in the universities. Some beginning will have to be made in the Fourth Plan to promote educational research.

Development of Special Courses and Programmes

24. New courses for the training of headmasters and training experts in evaluation, curriculum construction guidance and counselling, teacher education, educational administration, statistics, educational planning and finance etc. specialist teachers for handicapped and talented children etc., will have to be developed in the Fourth Plan. There will have to be two year M.A. in Education Courses and M.Ed. courses in special subjects and also two year B.Ed. training courses etc. The Education Commission has recommended these courses and have observed that details of these courses should be worked out.

State Boards of Teacher Education

25. The Education Commission has suggested the setting up of State Boards of Teacher Education so that a bridge is created between the institutions of teacher education under the Education Departments and the institutions which are within the fold of universities. The State Government of Maharashtra have already implemented this programme and the Gujarat Government are taking it up for implementation in the Fourth Plan. It may be necessary to encourage the other State Governments to take up this programme. The All India Association of Teacher Educators could assume the role of bringing about desired coordination among the State Boards till the question of the setting up of National Board of Teacher Education could be considered.

Production of Literature on Education in English and Modern Indian Languages

26. The availability of suitable literature in training institutions in regional languages is of vital importance for improving the quality of teacher education. Under this scheme, it should be possible to write suitable manuscripts by individual authors, teams of authors and institutions and publication grants should be available for this purpose. Translations or adaptions from standard books may be encouraged to augment the supply of literature. In this connection, it may be useful to carry out a survey of existing literature available to teachers by the State Institutes of Education and the University Grants Commission.

State Institutes of Education

27. To cope with the programme of revision and upgrading of curricula, preparation of text books, general reading materials, teachers' hand-books and audio-visual aids and introduction of improved evaluation techniques, the State Institutes of Education will be strengthened. It is proposed to provide a sum of Rs. 2 lakh per year for 20 State Institutes for the developmental activities. The total cost during the Fourth Plan will be about Rs. 3.00 crores.

Strengthening of State Institutes of Science Education

28. In some of the States, the Institutes of Science Education have not been set up so far and in others, the Institutes are not staffed and equipped properly. The State Institutes/Units of Science Education will be established as integral parts of the State Institutes of Education in all the States by the end of the Fourth Plan to develop curriculum in science and mathematics prepare better text books, teachers hand books, etc., organise in-service training course and generally to assist the State Directorates of Education in all matters relating to the teaching of science in schools. It is proposed to provide for the development of Institutes a sum of Rs. 3 lakhs every year. The cost of 20 Institutes will come to Rs. 3.00 crores.

Pre-primary Teacher Training

29. An outlay of Rs. 1 crore is suggested for pre-primary teacher training programmes.

Statement I. List of schemes and outlays for Teacher Education in the Fourth Plan - 1969-74.

(Rs. in crores)

Sl. No.	Name of the scheme	Revised by the Steering Committee
1.	2.	3.
1.	Expansion of Training Facilities	
	i) Training Schools ii) Training Colleges/University Departments of Education	36.00
2.	Correspondence Courses	
	i) Elementary School Teachers	7.00
	ii) Secondary School Teachers	3.75
3.	In-service Programmes	
	i) Elementary School Teachers	9.00
	ii) Secondary School Teachers	5.00
4.	Improvement of existing institutions	
	i) Training Schools	22.35
	ii) Training Colleges and University Departments of Education	7.50
5.	Upgrading the academic qualifications of teachers	
	i) Elementary School Teachers	8.00
	ii) Secondary School Teachers	6.00
6.	Professional advancement of teacher educators	3.00
7.	Educational Research	1.00
8.	Development of Special Courses and Programmes	2.00
9.	State Boards of Teacher Education	0.40
10.	Production of reading materials, text-books etc. for teachers	2.00
11.	State Institutes of Education	3.00
12.	State Institute of Science Education	3.00
13.	Development of pre-primary education - Research and Training and Pilot Project	1.00
	Total	120.00

Statement II. List of schemes and outlays for Teacher Education in the Draft Outline of Fourth Plan.

Sl. No.	Name of the schemes	Outlays (Rs. crores)	Targets
1.	2.	3	4.
1.	Training of Elementary School Teachers		
	(a) Full time expansion	35.00	60,000 additional seats
	(b) Improvement of existing Training Institutes	14.00	Improvement of 1.3 lakh seats
	(c) Correspondence Courses for Training untrained teachers	6.00	Correspondence course for 1.4 lakh teachers
	(d) In-service Training Courses	5.00	
	Total	60.00	
2.	Secondary Education		
	(a) Full time expansion of training facilities	21.00	Training of 56,000 teachers
	(b) Improvement of existing training institutions	3.00	Improvement of 150 training colleges.
	(c) Correspondence Courses for training untrained teachers	2.00	Correspondence Courses for 17,660.
	Total	26.00	
3.	State Institutes of Education	2.00	Strengthening of 15 Institutes.
4.	Pre-Primary education (training of teachers, research etc.)	2.00	
5.	State Institutes of Education	2.00	
	Total	6.00	
	Grand Total	92.00	

ANNEXURE VII

PLANNING COMMISSION
(Education Division)

...

SOCIAL EDUCATION IN THE FOURTH PLAN

Introduction

Widespread illiteracy is a real handicap in the way of both economic and social development. Due to a variety of reasons, the programme of liquidation of illiteracy has not been adequately attended to in the past and has led to various problems. Though literacy* increased from 17% in 1951 to 24% in 1961 and is expected to have increased to about 33% in 1968-69, the number of illiterates also increased from 298 million in 1951 to 334 million in 1961 and is expected to increase to 349 million in 1968-69, due to the increase in population. In 1960-61, the literacy percentages in the age-group 15-44, which constitutes the working force, and is very important from the point of view of the production capacity of the country both in industrial and agricultural sectors, was 30.6%. The number of illiterates in this age-group was 131 million. It is estimated that in 1968-69, out of the total population of about 230 million in this age-group 150 million would illiterate.

---

* Percentage refers to total population. The criterion for literacy as indicated in the Census of 1961 is explained below:-

> "The test for literacy in the Census of 1961 was satisfied if a person could with understanding, both read and write. The test for reading was ability to read and simple letter either in print or in manuscript. If the person could read one of the examples in the enumerator's handbook with facility, he was taken to have passed the test for reading. The test for writing was ability to write a simple letter. To qualify for literacy, a person was not required to pass any standard examination. On the other hand, literacy was recognised as something a man still possessed and actively put to use and it was in this general practical sense that it was uniformly applied. The results are thus comparable from area to area. If a person could both read and write and had also passed a written examination or examinations as proof of an educational standard attained, the hignest examination passed was to be recorded." - Census of India - 1961, Vol. I, Page XIV.

Causes of slow rate of literacy

2. The main reasons for the low rate of literacy in India is the inadequate provision for compulsory primary education facilities and the huge problem of wastage and stagnation. The other reason for retarding the growth of literacy is the inadequate support given to it in terms of finances and low priority given to it in development plans. In 1950-51, the expenditure incurred on social education was Rs. 3.56 millions (0.6 per cent of the total educational expenditure of Rs. 1440 million). In 1965-66, the expenditure incurred on social education was Rs. 12.00 million (0.2 per cent of the total educational expenditure of Rs. 6,000 million). While the total expenditure on education during the period 1951-66 increased about four times, the expenditure on social education increased only by one and a half times. This means that, in educational development programmes, adult literacy and social education have been given the lowest priority. Thus, for instance, while the proportion of expenditure incurred on social and adult education to the total educational development programmes in the First Plan was 3.3, it was reduced to 1.5 in the Second Plan and to 0.5 in the Third Plan. Even in the literacy classes, conducted in the country, the main emphasis is on reading and writing without any due regard being given to the functional aspects of literacy programme. There has also been lack of coordination between various departments in organising literacy programmes. The educational administrators and planners have not felt the need for linking adult education and adult literacy with economic development with the result that the priority given even in overall planning and educational development has been very low. The educational administrators have been adopting the conventional and orthodox methods without creating any motivation among the adults or mobilising voluntary public and political support for developing the programmes.

Approach

3. Within the span of the next five years, it would be an impossible task to take up the programme of eradication of illiteracy among 150 million adults in the age-group of 15-44. The strategy may be to take up this programme in a modest way by concentrating on the most sensitive age-group of 15-24, where the number of illiterates is estimated to be about 60 million. It may not, however, be desirable to neglect the other age-groups particularly the illiterates in the age-group 25-44, who form the majority of the leaders in the villages at present. Further, in the Fourth Plan, Social Education which in its comprehensive sense, includes literacy, the health, recreation and home life of the adults, their economic life and citizenship training would largely centre around functional literacy which can be achieved in two stages. While financial resources for adult education will have to be found, for other programmes, there is no need for expenditure but of organisation. The organisations which can take care of such programmes will have to be identified.

First stage of adult education

4. The first stage of adult education may be in the form of a mass movement largely dependent on the mobilisation of local resources, both of personnel and finance. This again can be taken up by (a) educational institutions in neighbouring villages and towns and cities, and (b) non-student educated youth and other social workers in compact areas.

Literacy by educational institutions through adoption programmes

(a) Students, teachers, members of professional classes, educated people etc. can be an important asset in this movement. Here the cooperation of secondary students and that of college students through the programme of National Social Service, which has already been accepted for implementation, can be obtained. Every educational institution may be required to run literacy classes regularly and be given responsibility for liquidating illiteracy in a specified neighbouring area, the size of which may be determined by the size of the staff and the number of students available for literacy work.

Literacy - campaigns in selected areas

(b) Towards the end of the Third Plan, Adult Literacy Pilot Projects were implemented, as an advance action programme, to take up a massive programme of adult education in the Fourth Plan. The results of the projects implemented have indicated that public cooperation in imparting literacy has been coming forth, though there would be need for some incentive awards and transportation charges etc. to encourage workers to take up this work. In 1968-69, these pilot projects are being taken up in more States. In the course of the Fourth Plan, literacy on the lines of these projects will be taken up in compact areas in selected blocks. A small area of manageable size, whether a large village or a Panchayat Samiti Block can be taken in hand for concentrated effort, with the object of making every adult, especially in the age-group 15-24 literates. Literacy programmes amongst adults will be organised wherever there is necessary atmosphere and local enthusiasm. The first phase may be largely on a compaign basis with the added condition that the follow-up for taking the neo-literates upto the functional standard would immediately follow without leaving any gap between the two.

5. The main effort under these twin programmes would be to provide the first stage of literacy to 10 million illiterates in the rural areas, especially in the age-group 15-24, whose total number is about 60 million. In addition, 5 lakh illiterates will be covered in the hilly and tribal areas.

6. The second stage would include a regular and systematic education of those who are identified at the first stage, both in rural and urban areas, as being capable of putting in serious effort.

Functional literacy in rural areas

(a) A start has already been made in giving functional literacy in the rural areas covered by the high yielding variety projects. The number of such projects may have to be increased. The functional literacy projects will be taken up in high yielding variety areas, in conjunction with Rural Industries Projects and other similar projects in different States. The functional literacy programme will need a paid teacher on part-time basis and a proper library containing suitable follow-up literature. This entire programme may be financed jointly by the State and the local community. It is proposed to cover 11 million illiterate adults, mostly in the age-group 15-24 under this programme.

Functional literacy in urban and industrial areas

(b) Programmes of adult education will have to be developed in industrial and commercial undertakings - public and private - Government offices, etc. In fact the State and Central Governments should give a directive to their offices and public sector undertakings to make their workers literate. It should be possible to make about 5 lakhs persons literate under this programme.

(c) The development of adult education, especially in industrial areas, has been strongly recommended by the Planning Commission, COPP Team on Literacy among Industrial Workers and by the Education Commission. The success of the programme of literacy will largely depend upon how major occupational groups can be identified and effective literature of a functional character produced for them. In the case of large organised, identifiable groups like industries, large farms, government offices etc., it may be the responsibility of the employer to provide literacy and social education to this workers.

Further Education for Industrial workers

7. In addition to these programmes, corporations and other local bodies, institutions may also arrange adult education programmes for slum areas. About 2 million adults may be covered under this programme. Industrial plants, both in the public and private sector, may take the lead in organising classes for workers and encouraging them to go in for various examinations. In view of the important role which the working classes play in improving production, their education may not be allowed to end after they have become functionally literate. The main function of these programmes may be to equip an increasing number of workers with higher technical and vocational qualification so that they can rise to positions of responsibility in the industry.

Selected literacy projects

8. A number of experimental projects viz. Vidyapeeths, Janta Colleges, Workers Social Education Institutes, Polyvalent Centres, continuation classes for adults, extension departments, correspondence courses etc. initiated earlier have, in certain cases, done commendable work and have proved their worth. To promote these activities on a larger scale in various parts of the country, assistance may be given to the State Governments and voluntary organisations for taking up such projects. In the Fourth Plan, Voluntary organisation should be given all encouragement to realise their full potential for work in the field of adult education, where they have many advantages over official agencies.

9. The Universities have an important part to play in extra-mural and extension lectures, taking up literacy and adult education classes, conducting researches and studies, organising pilot projects, correspondence courses, training of key personnel etc. For organising such activities, the Universities should be helped in setting up Departments of Adult Education.

Training of literacy workers

10. Attention would also be paid to the training of literacy workers. The training of workers for carrying out literacy work may have to be organised on a big scale. The training may be short and intensive both for salaried and voluntary workers.

Library services

11. The other problem is that of organisation of library service. There will have to be an extensive net work of libraries covering the whole country, at all levels, manned by properly trained librarians. School libraries may be integrated with the system of public libraries. Libraries will need reorganisation in order to function as media of adult education. They may need to be stocked with reading materials, which will lead the neo-literate step by step from simple but interesting reading to more advanced books giving information of value to them.

Book Production

12. Before the programme of literacy is taken up, in a big way, it may be necessary to organise a large number of workshops in different parts of the country (in every linguistic area) for training writers of suitable books for the neo literates. This reading material may be required in enormous quantity, if the follow-up is to be effective and is to have relevance to the life and social needs of those people. Besides, the business of book production for the use of the masses of the people may have to be undertaken on a big scale. This will call for a considerable amount of specialised skill, resourcefulness and organisation. It may be necessary not only to ensure the production of the right type of reading material but also in the practical aspects of the scheme, quality of printing, efficient organisation in production and distribution.

of books and other printed material. The literature provided by various technical departments centring round various development programmes may have to be suitably processed by the Education Departments in order to suit the mental equipment of adults. The literature will have to be life-centred and in this connection the role of wall news paper cannot be over-emphasised. Some of the talks meant for rural listeners can also be given in the form of suitable lessons to be used in literacy classes.

Literacy and mass media

13. Modern means and scientific aids may be pressed into service in support of the campaign of literacy and also other adult education programme to make them attractive and more effective. Aduio-visual aids, radio listening, preparation and exhibition of special films, even the use of television and other media of mass communication may be tried to the extent financial resources permit. To a large extent funds for organising these programmes area already provided in the budgets of the Department of Information and Broadcasting.

Literacy Administration

14. Taking up the various programmes of adult education, as detailed above, would mean considerable work load on the staff in the States. To strengthen the State Departments of Education at the district, block and village levels, and also at the headquarters, additional technical staff may have to be appointed. Adult Education programme will need the closest collaboration and cooperation of various governmental authorities, ministries and departments as also between official and non-official organisations. State Boards of Adult Education may have to be set up to provide the necessary inter-departmental coordination, to organise programmes like the initial phase of literacy, functional literacy, obtaining non-official support from all possible sectors etc.

Targets of literacy

15. Adult Education programmes are generally informal. They have a large variety and standards of courses. They can be as numerous as the groups and sections of the community which they would serve. The basic idea would be to provide facilities, opportunities and means for them to acquire knowledge and in their functions as citizens. A big and nation-wide programme of adult education, organising the movement, preparing the materials, training personnel and a number of other requisites, requires time. It would be possible to achieve full literacy in various areas, at different times, depending upon the stage of educational development in area, the degree of public cooperation and the efficiency of organisation. Any postponement of the date of liquidation of illiteracy beyond the period of 10 to 15 years may aggravate the problem. In 1968-69, it is estimated that out of the total population of 20 million in the age-group 15-44, the number

of literates may be 80 million or about 35 per cent. In the age-group 15-24, out of the total population of 100 million the number of literates may be about 45 million or about 45 per cent. The objective, therefore, may be that, it should be possible, by providing literacy to about 35 million adults under various programmes, to raise the percentage of literacy in the age-group 15-24 from about 45 in 1968-69 to 66 by 1973-74. In the age-group 15-44, by 1973-74 the percentage of literates is expected to be about 45 or so.

Outlays for adult education

16. For various programmes relating to adult education, a provision of Rs. 40 crores will be required as detailed in the Statement enclosed. The appendices enclosed with this note indicate the norms of costs of some of the important programmes.

Popular leadership and literacy

17. Motivation for literacy and retention of literacy once imparted are two important problems which need the urgent attention of educational administrators. Adult education programmes can be successful if it is ensured that there is follow-up in terms of the provision of reading materials through a net-work of libraries. The Fourth Plan makes provision for the follow-up materials adequately. As far as motivation is concerned, in a democratic set-up, it will depend on the level of political and popular leadership and the enthusiasm which can be generated by treating literacy as a national programme. The Education Commission have observed that the responsibility for initiating a massive movement to combat illiteracy goes beyond the capacity of the administrative and educational system that it rests squarely upon the political and social leadership of the country. This is more true now than ever.

Statement. Adult Education in the Fourth Plan - List of schemes.

Provision & Targets

Name of the Scheme	Physical Targets	Financial outlays (Rs. crores)	Details about norms and costs.
1.	2.	3.	4.
1. First stage of literacy in rural areas	15 million	6.00	Appendix I
2. First stage of literacy in tribal, hilly, border, denotified areas.	1½ million	0.40	Appendix II
3. Functional literacy in rural areas including high yielding variety areas	10 million	14.00	Appendix III
4. Literacy in urban and industrial areas	2 million	2.00	Appendix IV
5. Establishment of block libraries	1,200	6.30	
6. Strenthening of existing block libraries	175	0.43	Appendix V
7. Village circulating libraries	-	4.07	Appendix VI
8. General reading materials for neo-literates	5 crore booklets	3.00	Appendix VII
9. Training of Librarians.		0.10	
10. Training literacy teachers, workers, and key personnel		0.10	
11. Experimental Project (Workers' Social Education Institutes, Vidyapeeths, Extta-mural lectures, polyvalent centres)		0.20	
12. Assistance to voluntary organisation	5 million literates	3.00	
13. Production of literature for neo-literates and for neo-reading public (Department of Adult Education of NCERT)		*	
14. Strengthening of literacy administration		0.10	
15. Departments of Adult Education in Universities		0.30	
	Total:	40.00	

* Provided under NCERT.

Appendix I. First Stage of Literacy in rural areas.

The per capita expenditure from Government sources on the first stage of literacy for a period of 4 months was earlier estimated to be about Rs. 1.00 with the break-up shown in Table below.

Table. Cost per capita - Initial Literacy.

Sl. No.	Articles etc.	No.	Approximate price
1.	2.	3.	4.
			Rs.
1.	Primer	1	0.50
2.	Chart for a Group upto 30 members @ Rs. 1.50 per chart		
	Share per adult	1	0.05
3.	Progress record book @ 0.90		
	Share per adult	1	0.03
4.	Teachers' Guide @ Rs. 1.40		
	Share per adult	1	0.04
5.	Note-books @ Rs. 0.19	2	0.38
	Total		1.00

It was assumed that the Community Panchayat Samitis etc. will bear the cost of slate, pencils, kerosene oil etc. which would roughly amount to Rs. 1.00. For calculation purposes, this expenditure was let out earlier on the assumption that this will be the share of the community on the lines of the Gram Shikshan Mohim of Maharashtra. The Conference of Adult Education Officers convened in 1966 by the Ministry of Education was, however, of the view that this was a very low estimate. It was thought that though no regular remuneration would be given to social workers etc. for conducting literacy classes, there would be need for giving incentive awards, transportation charges etc. in some form or the other. Further, the cost of materials, kerosene oil had also gone up. They were, therefore, of the view that the cost per capita from Government sources, for the initial phase of literacy, should be assumed to be Rs. 4/-.

Appendix II. First stage of literacy in tribal, hilly, border, denotified areas.

For the backward, hilly, tribal, denotified areas etc. where it would not be possible to enlist public support for making adults literate through voluntary workers etc., the cost per capita for a period of 4 months would be about Rs. 8/- with the break-up of the different items as shown in Table below.

Table. Cost per capita - initial literacy in tribal, hilly, denotified areas.

Sl. No.	Teachers/articles	Approximate cost
1.	2.	3.
1.	Teacher	
	Rs. 20/- per month for four months for 30 adults	Rs. 80.00
2.	Lanterns	
	6 @ Rs. 8/- lasting 4 years	
	6 x 8 / 4 x 2	Rs. 6.00
3.	Kerosene oil	
	@ Rs. 10/- per month Rs. 10 x 4 months	Rs. 40.00
4.	Primers	
	@ Rs. 1/- 30 x 1	Rs. 30.00
5.	Note Books and Pencils	
	@ Re. 1/- 30 x 1	Rs. 30.00
6.	Slates Re. 1 x 30	Rs. 4.00
7.	Teachers' kit	Rs. 4.00
8.	Contingencies	
	Rs. 5 x 4 months	Rs. 20.00
	Total for 30 adults	Rs.240.00
	Cost per adult	Rs. 8.00

Appendix III - Functional Literacy

Cost of one literacy group or class of 30 adults of 6 months' duration.

1.	Salary/Honorarium of one Instructor at Rs. 20/- p.m.	Rs. 120.00
2.	Salary of Supervisor at Rs. 50/- p.m. 1/10th of Supervisor for one class.	Rs. 30.00
3.	Training of Instructor or teacher	Rs. 50.00
4.	Training of Supervisor at Rs. 30/- 1/10th of Supervisor for one class.	Rs. 3.00
5..	Slates (Rs. 1 each)	Rs. 30.00
6.	Note-Books (Rs. 1/- each)	Rs. 30.00
7.	Primers etc. at Rs. 1/- each	Rs. 30.00
8.	Instructors' kit.	Rs. 4.00
9.	Kerosene Oil	Rs. 60.00
10.	One Petromax (Rs. 60/-), Two Hurricane Lamps (Rs. 8 each) lasting 4 years	
	$\frac{60 \times 1}{4 \times 2} + \frac{2 \times 8}{4 \times 2}$	Rs. 10.00
11.	Maps and Charts etc.	
	$\frac{15}{4 \times 2}$	Rs. 2.00
12.	Follow-up material - Rs. 5/- per set of 10 books - 30 sets for 2 years	Rs. 40.00
13.	Wall Newspaper	Rs. 2.00
	Total for 30 adults	Rs. 411.00
	Cost per adult	Rs. 13.70 or
		Rs. 14.00

Appendix IV. Literacy in Urban and Industrial Areas.

The Social Education Committee of the City of Bombay has been doing commendable work for the urban and industrial youth in providing adult and further education. The development of urban social education especially in industrial areas has been strongly recommended by the Planning Commission, COPP Team on Adult Literacy in Industrial Areas. It would be necessary to have Social Education Committees in at least 10 cities on the pattern of the Bombay City Social Education Committee. The target for providing social education and adult education to urban youth though the social education committees during the Fourth Plan is about 20 lakhs youths. It is expected that the total cost on making per industrial and urban youth literate would be about Rs. 20/-. Out of this, the Government expenditure would be about 50% and the rest would be borne, by the Social Education Committees/Corporation/ Municipalities/Employers. On this basis, the Governmental expenditure, during the Fourth Plan on covering 20 lakhs of youth would be Rs. 2 crores.

Appendix V. Block Libraries

1. Out of 5223 Blocks, spread over the rural areas in the whole country, 1394 Blocks have libraries. The Planning Commission Working Group on Libraries have observed that the Block Libraries will be the main centres of the State Library system which will directly render service to the rural population and further extend, in due courses, such service through village level libraries. As the resources would not be sufficient to establish and maintain self-contained village level libraries immediately, an attempt will be made to build up a sure base in the Block Libraries for village level service. The target could be that, by the end of the Fourth Plan, 2610 Block Libraries or 1/2 of the 5223 Blocks should have well-established library system. The additional Block Libraries which will have to be established during the Fourth Plan would be 1216 or 1200 (2610 Block Libraries minus 1394 existing Block Libraries). Assuming a minimum recurring expenditure of Rs. 15,000 per Block Library, including the salary of staff (a Librarian and a clerk) the amount required will be as under for a period of 4 years.

(Rs. in crores)

Phasing	No. of Libraries.	Expenditure.
II Year	200	0.30
III Year	200	0.90
IV Year	400	1.50
V Year	400	2.10
Total	1200	4.80

Building for New Block Libraries

2. It may not be possible to construct buildings for all new Block Libraries. In the Fourth Plan it is proposed to provide buildings only for 600 Block Libraries. The cost of these buildings at the rate of Rs. 25,000 per building (including Rs. 5,000 for skeleton shelving for books) would be Rs. 1.50 crores.

Strengthening of Existing Block Libraries.

3. It is also proposed to strengthen one eighth of the existing Block Libraries i.e. 175 libraries at the rate of Rs. 500 per annum for a period of 5 years and the cost will be Rs. 43.5 lakhs.

4. Total cost would be Rs. 6.73 crores.

Appendix VI - Village Circulating Libraries

Strengthening the existing Block Libraries and establishing libraries in new Blocks by itself will not extent the library facilities to all the villages. Considering the fact that the number of titles is limited, it is essential that the books are kept circulating and that there is provision for the circulation of books and later the assimilation of these books by the villagers. It would be essential that there should be provision of a librarian who goes round the villages himself, checking on the work that is being done in the distribution and assimilation of book material. It is assumed that the existing Block Libraries have provision of a Librarian. The provision of a librarian assisted by a clerk for each of the new Block Libraries has been separately provided. The Block Librarian will have to maintain a record of the reactions to the book material by the readers. The maintenance of this record is essential.

2. For regulating the traffic of incoming and outgoing book material, to and from Blocks to villages, it may be necessary to provide for a type of an intinerant library assistant, about 5, for a Block, to begin with, who would be going round on cycle. The primary school teachers would be responsible for circulating the books in the villages through the school children and other local people. This facility will have to be provided for all the 3900 Block Libraries. The salary of an itinerant Library assistant at the rate of Rs. 40/- per month for a period of five years for all the Blocks, after proper phasing, would be Rs. 1.56 crores $\frac{(3900 \times 5 \times 40 \times 12)}{3}$ In addition to this, the Zila Parishads and Panchayats may like to pay some allowance to the itinerant library assistants.

3. For the purchase of 5 cycles for each of 3900 Blocks at the rate of Rs. 200 per cycle and maintenance cost of Rs. 50 per cycle, the cost would be Rs. 48.75 lakhs (3900 x 1000 + 250).

4. It is estimated that the other expenditure invovved in the travelling of Block Librarians, transportation of books from Districts to the Blocks etc. may be about Rs. 46 lakhs.

5. Thus the cost on village library circulating system would be as under:-

	(Rs. in crores)
(a) salary of an intinerant	1.56
(b) Cost of cycles and their maintenance	0.49
(c) T.A. & Transportation charges	0.46
(d) Honorarium to Primary Schools Teachers who will be incharge of circulating libraries in the villages	1.56
Total:	4.07

Appendix VII - General Reading Material for Neo-Literates.

The number of adults to be covered under the programme of the first phase of literacy would be 30 million and they will be spread over all the villages in the country. The programme would be to supply general reading materials for these neo-literates by supplying 100 booklets during Fourth Plan for all the 5 lakhs villages or the areas where the first phase of literacy has been taken up. These books would be supplied to primary school teachers in the villages through a wide net work of Block Libraries and village mobile libraries, which will be responsible for circulating these to the neo-literates. The number of booklets required would be 5 crores (5 lakhs x 100 booklets). The production charges of 5 crore booklets of 40 pages of demi size with 16 pt. type size, at the rate of 60 paise per booklet, would be Rs. 3 crores. Out of Rs. 3 crores, the production charges of 5 crore booklets would be Rs. 2 crores and the rest for printing and paper.

PLANNING COMMISSION
(Education Division)

National Service Programme, Youth Welfare and Physical Education Programmes in the Fourth Plan

Compulsory NCC was started in 1962-63 to cover all able-bodied under-Graduate boys studying in first three years of the Degree Course. During 1966-67 NCC strength was about 10 lakhs. Later on the Inter-University Board decided to reduce the period of compulsion from three to two years. During 1967-68 the strength of NCC dropped to 7.5 lakhs. Recently the Inter-University Board have taken a decision to make NCC optional from 1968-69. The Ministry of Defence have indicated that maximum ceiling for NCC (Senior Division) will be 3 lakhs boys and 1 lakh girls.

2. The Education Commission(1964-65), in their Report reviewed the position relating to Social and National Service and recommended that a programme of national service may be developed as an integral part of education which would run concurrently with academic studies in schools and colleges. The proposals have been considered, at various levels, and details have been worked out.

3. It is now proposed to develop in the universities an alternative programme to NCC in the form of National Service Corps(NSC). Students showing marked proficiency in games and sports would be given facilities of further improving their standard through National Sports Organisation(NSO). It has been agreed that during 1968-69 the National Service Corps programme will be developed on a pilot project basis on the initiative of the colleges and universities and the coverage would be 1 lakh students. Central Government share of expenditure is estimated at Rs. 100/- per student per year and of the State Government Rs. 50/- per student per year.

4. It has been agreed that the programme will be optional but will be developed to attract maximum number of students in worthwhile projects to be initiated by the students and teachers of the institutions. There will be emphasis on adoption of villages for literacy drives and constructional activities in cooperation and coordination with local authorities. In order to allow flexibility and initiative it is proposed that lump-sum grants be given in the beginning of the financial year on a per capita basis to the universities to make the gprogramme effective. Annual evaluation will be published for the information of both State and Central Governments.

5. The Ministry of Defence, as indicated earlier, have suggested that the strength of NCC should not exceed 4 lakhs despite the increase in enrolment visualised during the Fourth Plan. As far as NSC and NSO programmes are concerned, during 1968-69, in consultation with the Ministry of Finance, a provision of Rs. 1 crore has been approved to cover 1 lakh students - 80,000 in NSC, 20,000 in NSO. It is proposed to progressively increase the coverage of students under this programme from 1 lakh in 1968-69 to about 6 lakhs in 1973-74. Thus, by the end of Fourth Plan, the coverage of students under NCC, NSC and NSO programmes would be 10 lakhs as against the total projected enrolment of 12 lakhs in all the faculties and classes of universities, excluding Intermediate, Pre-University and Post-Graduate classes. The total enrolment in colleges and universities in 1968-69 is expected to be 17 lakhs and this is likely to increase by 5 lakhs by the end of the Fourth Plan. The phasing of the programme in the light of the projected targets are indicated in Table 1.

Table 1: Student strength in NCC, NSC and NSO

(Figures in lakhs)

Sl. No.	Year	N.C.C.	N.S.C.	N.S.O.	Total (3+4+5)
1.	2.	3.	4.	5.	6.
1.	1969-70	4.00	2.20	0.50	6.70
2.	1970-71	4.00	2.65	0.85	7.50
3.	1971-72	4.00	3.10	1.20	8.30
4.	1972-73	4.00	3.55	1.60	9.15
5.	1973-74	4.00	4.00	2.00	10.00

6. The cost of covering NSC and NSO to 4 lakh students by the end of theFFourth Plan has been worked out in Table 2:

Table 2: Provision for N.S.C. and N.S.O. in Fourth Plan.

(Rs. in crores)

Year	Centre	State	Total	Targets of coverage (Figures in lakhs)
1.	2.	3.	4.	5.
1969-70	2.70	1.35	4.05	2.70
1970-71	3.50	1.75	5.25	3.50
1971-72	4.30	2.15	6.45	4.30
1972-73	5.15	2.575	7.725	5.15
1973-74	6.00	3.00	9.00	6.00
Total:	21.65	10.825 (or 10.83)	32.175 (or 32.18)	

The total cost of the programme would be Rs. 32.175 crores, out of which Rs. 21.65 crores would be Centre's share. It is expected that State Governments will find their share of expenditure from the savings on account of the reduced stregnth of NCC as agreed to between the Centre and the States during various discussions and will form part of the non-Plan expenditure. The Central Government share of the expenditure has been calculated to be Rs. 21.65 crores on the basis of the targets shown in Table I. If, however, the level of expenditure reached in 1966-69, is to be treated as part of non-Plan, then the Central Government expenditure may be Rs. 16.65 crores.

Youth & Physical Education Programmes

7. The programmes of giving grants to national sports, organisations, mountaineering foundations will be continued. Programmes of Scouting and Guiding will be promoted. The physical education teachers training institutions will be strengthened and programmes of Lakshmibai College of Physical Education will be expanded. The other programmes would be national physical efficiency drive, establishment of national sports centre, rural sports, holiday camps.etc.

8. The Ministry have set up a Study Group to consider the programmes of Youth Welfare in the Fourth Plan. The report of the Group is not available yet.

Planning Forums

9. This is a continuing programme which was started in 1956. The number of Planning Forums have steadily increased in the last decade and now more than 1000 Forums are functioning throughout the country in Universities and Colleges. Through these Forums a large number of teachers and students have been involved in the planning process. They raise their own local resources and with such assistance as they receive from the Government these Forums, organise lectures, talks, seminars, symposia, easay and debating competitions, exhibitions and small scale savings campaigns, and undertaken socio-economic surveys, literacy drives, etc. In recent years, the scope of the programme has gradually increased and a welcome trend is the adoption of the adjoining villages and slum areas, in increasing number, by Universities and colleges for sustained developmental and constructive work. This is intended to be the main focus in the Fourth Plan so that the Universities and colleges play an effective and useful role in the formulation and implementation of Plan programmes for the local area where they are situated. The following are some of the main activities which are proposed to be undertaken.

a) Research studies, Investigations and Planning and Local Schemes;

b) Preparation of Town and City Development Plans;

c) Participation in Constructive work by Institutional adoption of villages or slum areas for welfare extension work;

d) Training of local Voluntary Workers for Community Development and Welfare Activities;

e) Evaluation; and

f) Social Education Programme.

This expanded programme for which there is a good deal of popular enthusiasm, an outlay of about Rs. 1 crore, same as provided in the draft outline of the Fourth Plan, will be necessary for achieving the target of 18000 Forums by the end of the Fourth Plan. This will mean that another 800 Forums will be added during the course of the Fourth Plan with expanded programmes.

10. The tentative allocation for these programmes during the Fourth Plan would be as under:

		Rs. in crores
1)	N.S.C.	15.00
2)	Youth Welfare, Sports Physical Education etc.	14.00
3)	Planning Forums	1.00
		30.00

The scheme-wise break-up of Rs. 30 crores is shown in the enclosed statement.

Statement

PLANNING COMMISSION
(Education Division)

Proposed outlay for schemes under National Service Programme Youth Welfare and Physical Education in the Fourth Plan.

(Rs. in lakhs)

A.	PHYSICAL EDUCATION, SPORTS & GAMES	
1.	Grants to National Sports Federations.	30.00
2.	National Institute of Sports and National Coaching Schemes.	40.00
3.	Coaching Camps, Purchase of Sports equipment etc.	10.00
4.	Promotion of Recreation	5.00
5.	Establishment of National Sports Centre, Sports House and Sports Hostel in Delhi	40.00
6.	Play-grounds(including Swimming Pools, Stadia, Gymnasia etc.)	300.00
7.	Development of Sports and Games in rural areas.	80.00
8.	Grants to Indian Mountaineering Foundation.	3.00
9.	Promotion of Scouting and Guiding	15.00
10.	Laxmibai College of Physical Education, Gwalior.	20.00
11.	Strengthening of Physical Education Training Institutes and Physical Education Departments of Universities including N.F.C. Training Programmes	35.00
12.	National Efficiency Drive	5.00
13.	Promotion of Training and Research in Yoga.	5.00
14.	Other Physical Education Programmes	12.00
	Total:	600.00

		Rs. in lakhs
B.	Youth Programmes	
1.	Scheme of Campus Work Projects	10.00
2.	Health Services	60.00
3.	Guidance & Counselling (Summer courses etc.)	10.00
4.	Day Homes/Study Centres Text-book Library Book Banks and subsidized food.	120.00
5.	Development of services for non-student youth through educational institutions	100.00
6.	Youth Centres	100.00
7.	National Integration programme of Youth.	400.00
	Total:	800.00
C.	National Service and Vikas Dal	1500.00
D.	Planning Forums	100.00
	GRAND TOTAL:	3000.00

Annexure IX

PLANNING COMMISSION
(Education Division)

Educational Administration and Planning in the Fourth Plan

In the Guidelines issued to the State Governments, the following approach was suggested:-

(a) Streamlining of the planning, implementing and evaluating machinery ought to be given the highest priority to ensure the most effective utilisation of investment. Each State Government may carefully evaluate the present strength of its cadres, its recruitment and training policies and the motivation provided to personnel at various levels, and provide for remedial measures. It would also be essential to streamline procedures and decentralise decision-making authority to enable planning from below and ensure effective involvement of the people and the personnel at various levels. It will also take into account the vast variation of needs at the local level. Maximum possible initiative may be given to the institutions.

(b) The Education Commission has recommended that the District should become the unit of planning and administration. The staff needs at the district level may be carefully assessed and provided for.

(c) The supervisory machinery, especially as regards subject specialists in science and mathematics at the secondary level, needs considerable strengthening. The school complex idea suggested by the Education Commission may make more effective supervision possible, apart from developing an espirit de corps among the various educational institutions and teachers of various levels.

(d) The administration machinery has to develop the capacity to change in response to the needs of new programmes and policies. An effective planning and evaluation cell directly under the DPI may be necessary.

(e) Various allied programmes within and outside the education budget, will need to be coordinated so that facilities created are fully utilised.

(f) The various institutions - StateInstitute of Education, Institute of Science Education, etc. etc. - may be brought together as an effective technical arm of the Directorate, which could communicate with the NCERT at the Centre.

The Planning Commission attaches very high priority to these programmes. A Working Party was set up to consider in details the schemes relating to Educational Planning, Administration and Evaluation. The Working Group has since submitted its report.

Objective

2. Gearing of educational administration to developmental needs requires to be emphasised. This would involve, among other things, striving tirelessly towards growth both in its quantitative and qualitative aspects. It also implies that a continuous and integrated process of planning for the future, an evaluation of the past and present experience and the provision of the widest possible opportunities for the professional growth of the administration, should receive a great emphasis in educational administration. Development administration is also oriented to service and is more outgoing and open. It respects the individuality and freedom of educational institutions and teachers and emphasises the provision of essential guidance and extension services and strives to provide a free outlet for initiative, creativity and experimentation on the part of the schools and teachers. It is designed for a modernising and rapidly changing society in which the emphasis is on individual development rather than on conformity. It is based on a close and continuous collaboration and cooperation between teachers and administrators and provides due scope for the professional leadership of teachers. It is both democratic and decentralized.

Statistical Unit Director of Education

In the present situation, the Director of Education, who is pivot of administration at the State level, is so busy that he has hardly any time to review the various administrative practices and procedures and has no time to study these issues in any depth. It would be desirable that there should be strong Statistical and Planning units directly attached to the Director of Education which would provide him all such material to keep him fully abreast of the latest developments.

Recruitment of Administrators from the Teaching Profession

4. For developmental administration in the field of education, it would not be desirable to believe that an omnibus administrator could be effective because he would not have the necessary background and vision to transform the educational system. Administrators form hardly about 1% of the total teaching force and one of the urgent tasks should be to start the process of identifying talented people in the teaching profession and then providing special skills for undertaking specified jobs in the vast field of administration.

Providing the teachers opportunities for taking up administrative jobs and associating them with various academic bodies like the Panel of Inspectors, Boards of Secondary Education etc. will develop in them the feeling of commitment to programmes of educational development and open out to them the possibilities of rising up the educational ladder. It would also be necessary that the concept of once an Inspector all-times-an-Inspector has to be given up. This would mean introducing parity in the scales of pay and attaching special allowances to the posts of administrators.

Rationalisation of work-load of Inspectorate and Subject Supervisors

5. The position regarding the present work-load of Inspectorate varies from State to State but on the whole they do not find time to visit schools regularly. There is need for further augmenting the strength of Inspectorate. As norms to be adopted it may be desirable that at the primary stage, the target may be to have Inspector-School ratio of 1:40 and at the secondary stage it may be 1:30. This should include subject inspectors as well. One of the serious defects of present day educational administration is, that there are 'generlist' inspectors and not 'specialist' inspectors and, therefore, it is not possible to provide the necessary guidance and advice to the schools. This system has to be completely reversed.

Raising the Status of Educational Administrators at the District Level

6. In a number of States, the status of Inspectors of Schools/District Education Officers is that of Class II officers and as such they cannot carry their weight in the District vis-a-vis the other officers. In view of the fact that they have to carry a very heavy responsibility, all these officers should be class I officers.

Recruitment Administrative Services

7. Various methods have to be used to making the Educational Service at the Centre and State more broad-based by making it possible for University Professors, and others working in institutions of higher learning to take up administrative posts on a tenure basis. It should also be made possible for the officers working in the State and Central Education Service to spend some time working in the field in order to get first hand awareness of the problems of education. The Universities and Colleges and other educational research institutions should accept the principle of agreeing to men of proven worth and scholarship working in administrative jobs to be eligible for teaching and research in the universities for some time. This can be done by suitable relaxation in the recruitment rules especially in regard to the matters relating to experience in teaching and research.

Training of Educational Administrators

8. The problem relating to the training and retraining of the educational administrators requires to be given a very high priority. For fresh entrants to educational administration, there should be induction courses to be followed by regular in-service programmes. The State Institutes of Education should take care of arranging in-service training programmes for junior officers and for other senior officers, there should be one or two seminars arranged for short duration. The training of senior officers in the Education Department, whose number at the moment is about 600 and is likely to increase to 900, should be provided at the National level at the proposed National Staff College of Educational Administrators. At this level, there should be cross-fertilisation of ideas among senior officers and this could be provided by arranging programmes at the national level where senior officers could come for short duration and through seminars and workshops exchange their ideas and experiences with their couternparts in other States. Besides providing training programmes through seminars and workshops, the National Staff College for Educational Administrators would also undertake researches in problems relating to comparative study of various procedures and practices in the country and also of such problems in other countries relevant to our situation.

Evaluation in Education

9. The question of evaluation in education and conducting systematic and scientific evaluation of programmes has been neglected so far. It would be necessary to identify important programmes requiring evaluation. It would be desirable to define the objectives of the programmes, their outcomes etc. It would also be imperative to have a continuous mechanism of evaluation which would help in periodically reviewing the programmes and suggesting appropriate modifications. While the State Governments would be concerned with internal concurrent- mid-term evaluation as they were implementing programmes, the Centre should have a special role to play in this field because they are not directly involved with the implementation of programmes and their evaluation would be more objective and deep. Evaluation at the Central level can, however, be taken up only with the concurrence of the concerned State units etc. Evaluation of the Centre will have to be interdisciplinary and inter-departmental.

Institutional and District Planning

10. If districts have to be accepted as units for administration, planning has also to start from that level. In this connection, the idea of institutional and district planning has to be accepted as the most important programme which would bring about closer association of the community in the formulation of programmes and also for fuller utilisation of the existing facilities and augmenting the financial resources of the institutions.

Financial Implications of Educational Administration Programmes in Fourth Plan

11. For various programmes listed above, the financial allocation during the Fourth Plan would be as under:-

		Rs. in crores
1)	National Staff College for Educational Administrators	0.70
2)	Training of Educational Administrators at the State level through the State Institutes of Education etc.	3.00
3)	Up-grading the posts of Inspectors of Schools and D.E.Os from Class II to Class I.	1.00
4)	Additional staff at the District level and subject specialists and supervisors.	9.00
5)	Training of Headmasters/Inspecting Staff in institutional planning	2.00
6)	Statistical Assistants and other staff in the offices of the District Education Officers and other staff.	1.00
7)	Full-fledged Statistical and Planning Units at the State Headquarters.	3.00
8)	Educational evaluation	1.00
9)	Reorganisation of Educational Administration at the Centre	0.50
10)	Publication of journals and other reading materials	0.50
11)	Seminars and Conferences for Educational Administrations of Higher Education	0.20
12)	Deputation of Central and State administrative personnel for inter-state studies and tours	0.10
		22.00

Annexure X

PLANNING COMMISSION
(Education Division)

PROGRAMMES OF NATIONAL COUNCIL OF EDUCATIONAL RESEARCH AND TRAINING IN THE FOURTH PLAN

1. At the eighth meeting of the Steering Committee of the Planning Group on Education held on the 30th July 1968 held under the Chairmanship of Shri G.K. Chandiramani, Education Secretary, the National Council of Educational Research and Training was asked to revise its Fourth Plan proposals keeping in view the recommendations of the NCERT Review Committee set up by the Government of India. The NCERT was also asked to prepare its Fourth Plan within the ceiling of Rs. 10 crores.

2. The NCERT Review Committee has not yet asubmitted its report nor has the Council considered its tentative recommendations. However, assuming that its recommendations are likely to be accepted, an attempt has been made by the Office of the NCERT to indicate roughly the allocations for major programmes, during the Fourth Plan. The schemes along with financial provisions are indicated below:-

I	PROGRAMMES	Outlay (Rs. in lakhs)
A.	Academic	
	(i) Primary Education	80.00
	(ii) Secondary - Social Sciences and Humanities	52.25
	(iii) Sciences (Secondary)	57.63
	(iv) Educational psychology	37.44
B.	Technical	
	Central Science Workshop	63.05
	Audio Visual	64.09
	Survey and Data Processing	27.13
	Evaluation and Measurement	19.05
	Library and Documentation	58.39

C.	Publication	125.50
D.	Programmes at the Campuses of the Regional Colleges of Education, Teacher Education and Extension	33.48
E.	National Science Talent Search Scheme	152.47
F.	Cooperative Research and Research Grants (including Grant-in-aid to Approved Research Projects)	21.07

II. STAFF

(For National Institute of Education and Regional Campuses) 30.00

III. BUILDINGS

(For the campuses at Delhi and at Four Regional Campuses) 200.00

Total: 1021.55 lakhs

The above figures do not include the following schemes but provision to the extent noted against each /be will have to/provided in the IV Plan.

1)	Grant-in-aid to Extension Centres (Secondary and Primary) @ Rs. 25 lakhs per annum	Rs. 130.00 lakhs
2)	Adult Education	Rs. 45.81 lakhs
3)	Central Institute of Education	Rs. 16.82 lakhs

Further any new programme which might be allotted by the Ministry has not been indicated and no provision as such has been shown.

Annexure XI

PLANNING COMMISSION
(Education Division)

SCIENCE EDUCATION IN THE FOURTH PLAN

SCHOOL STAGE

Introduction

Considerable expansion in school education facilities has taken place in the first three Plans. During the Third Plan a number of steps were taken by the Government of India and the State Governments to effect qualitative improvement in the teaching of science, at the school stage. However, all these attempts were able just to touch a fringe of the problem. The need for giving a high priority tothe programmes of science education has become more urgent as the country needs more and more people who will be able to provide necessary technical man power and appreciate the contribution of science towards the betterment of their lives and can use the scientific method in solving their problems.

Present Position

2. Science in some form or the other is taught at the primary stage in all the States of the Indian Union. The physical facilities, the quality of programmes and the teacher competency are however far from satisfactory, with the result that this subject is mostly taught through reading activity as any other non-science subject and hardly contributes anything towards bringing about the desired attitudinal changes.

3. At the middle stage, science is prescribed as a compulsory subject in all the States, but in actual practice many of the schools where the necessary facilities of teaching science are not available, are allowed to offer other subjects in lieu of science as an optional subject. In the case of girl students, instead of science, domestic science is offered. Even today, in some States it is possible for a student to pass the middle stage without reading any science. At the high/higher secondary stage, different courses of science are available. In most of the States, the subject of general science is compulsory for all the students. In others, optional courses or elective courses of science of different duration are offered by the students. In some States it is even now possible for students to pass the high school/higher secondary examination without reading any science at this stage of school education.

3. So far as the position of science teachers is concerned there is an acute shortage in some of the States, particularly in the rural areas and the girls' institutions.

4. According to the Second All India Educational Survey, out of total of 64,981 teachers who are teaching science in secondary schools, only 65.1% possess the minimum qualification of a Bachelor's Degree. The number of trained science graduate teachers is even less. Even at the senior secondary stage, intermediates and matriculates who had no science education are also teaching the subject.

5. The shortage of post-graduate science teachers for the higher secondary sections is acute. There are about 5,500 post-graduates with science qualifications teaching at the higher secondary level out of which 50% possess the training qualifications also. Thus on an average, less than one post-graduate teacher is available for each higher secondary school against the minimum requirements of about 2.5 teachers.

6. At the middle school stage, very few trained science teachers with requisite minimum qualifications are available.

7. At the primary stage there is hardly any formal science equipment or a 'Nature Corner' available in any schools.

8. At the middle stage, the position of science equipment and physical facilities are equally bad. A very few schools have a separate science room at this stage of school education.

9. At the high/higher secondary stage about 8,000 secondary schools are without any science laboratory and only 14,500 have a laboratory for general science. Individual laboratories for physics, chemistry and biology at the senior secondary stage are available in about 7000, 7,000 and 3,000 schools respectively.

10. At the primary and middle schools stages, the science experiences are organised through a course of general science in all the States. During the recent years some of the States have revised their general science syllabus with a view to modernise and upgrade the content of science. The text-books for this stage are, however, far from satisfactory both in content and method of presentation. There are practically no teacher guide materials available for the help of teachers. At the senior secondary stage most of the science syllabi are outdated and provide very little practical work. Wherever a provision for such practical work exists, it is mostly of a verificational type, hardly contributing anything towards arousing the curiosity of the child and nurturing his creativity.

11. Very little attention is at present paid to the school science activities which play an important role in the teaching - learning of science. Only about 5% of the existing senior secondary schools have a science club in some form or the other. The activities are mostly of the collection, classification and model making type.

12. During the Third Plan period, 13 States have been able to set up a State Institute of Science or the Science Unit. Even these institutions have yet to develop fully to undertake the tasks which were envisaged for them.

13. At the primary level, there is hardly any provision for directing and coordinating the activities of science. At the district level no special supervision of facilities for the teaching of science are available. In all the States most of the present supervisory staff has hardly any background or contact with modern science and its developing methods.

Objectives

14. Realising the importance of science and taking into account the present position of science education in the country, the Fourth Plan should have following objectives in the area of science education.

i) Science should be provided as an integral part of the general education programme at least upto high school stage.

ii) To meet the challenge of explosion of knowledge in science, the teaching of this subject should be started from the beginning of the school and good foundation of the subject disciplines of science should be laid from the middle stage.

iii) Science curriculum should be up-graded and modernised.

iv) Necessary physical facilities of laboratory and equipment may be made available to as many schools as possible.

v) Better pre-service and in-service programmes for improving competence of science teachers to handle the modern curriculum may be developed.

vi) Agencies to play the leadership role at the State level may be strengthened.

vii) Necessary administrative facilities for directing and coordinating the State science education programmes should be created.

viii) A net-work of supervising agencies to ensure the implementation and proper development of the programme in the schools should be ensured.

ix) Keeping in view the limitation of resources - both human and financial - a strategy may be developed to strengthen the middle and the senior school stages. The primary school stage may be covered through experimental programmes in selected schools so as to provide experiences for developing future large scale programmes.

x) A net-work of in-service programmes should be organised to orient the existing teachers with the new curriculum.

xi) Close collaboration between Central agencies in the field of science education and the State agencies responsible for leaderships should be established and exchange of materials and its adoption or adaptation should be constantly ensured.

xii) Selected institutions may be encouraged to undertake activity programmes in science through science clubs and science fairs.

15. The work relating to modernising of curriculum and development of idifferent instructional matei materials e.g. text books, teachers' guides, curriculum guides, laboratory materials, equipment and kits should be done on a national level by the N.C.E.R.T. in collaboration with leading University Centres and State Institutes of Science Education.

16. The syllabi for training programmes, both pre-service and in-service should also be developed by the N.C.E.R.T. at the National level in cooperation with Universities and training institutes. The leadership training for the State personnel should be provided by the N.C.E.R.T. and its Regional Colleges.

17. At the State level the academic leadership should be developed at the State Institutes who should actively work in collaboration with the proposed university centres of science education. The administrative and organisational part of the science education programmes should be entrusted to the proposed Science Units at the directorate and its district supervisory staff.

18. Far organising the training programmes, the key personnel from the State Institutes of Science, Education and the district supervisory staff should be trained by the N.C.E.R.T.

19. The need for preparing better science teachers to handle modern curriculum should be met through the proposed new training centres both at the secondary and elementary clevels. The existing teacher training colleges and teacher training schools should be adequately strengthened to handle both pre-service and in-service programmes required during the Fourth Plan period. A large network of in-service programmes for elementary school science teachers should also be developed through selected senior secondary schools which were equipped during the Third Plan period with necessary laboratory facilities.

Proposed Schemes

20. Details of various programmes under elementary and secondary education are explained below:

Elementary

There are about 4,72,000 primary sections. Considering this large number, the emphasis during the Fourth Plan period should be on developing competencies of the primary school teachers for handling improved programmes of science. A selected number of schools may be equipped to develop experimental programmes and gather experience before large scale programmes are implemented.

i) Strengthening of existing 1,400 teacher training schools with laboratory and workshop equipment.

There are at present about 1,400 teacher training schools preparing teachers for primary schools. There are no laboratory facilities in these schools. It is proposed that in the pre-service training, the content of science and its methodology should be included as an integral part of the course for all primary school teachers. To achieve this, each training school has to be adequately provided with science and workshop equipment so that competencies of demonstration and improving improvising science equipment may be development in future primary school teachers. A provision of Rs. 1.40 crores is proposed for this purpose at the rate of Rs. 10,000/- for each training school.

ii) Provision of science kits to 21,000 primary schools.

It is proposed to provide science eequipment kits to 21,000 primary schools (60 primary schools per educational district) at the rate of Rs. 200/- per kit. This will enable these schools to teach the new courses of general science more effectively. The total cost of this programme will be Rs. 42 lakhs.

iii) In-service training of 21,000 primary school teachers of selected schools

With a view to enable selected primary teachers to teach new courses of general science, the teachers of 21,000 primary schools (which are proposed for a supply of science kits) will be trained through a two month in-service programme in 700 selected neighbourhood higher secondary schools/training schools. The total cost of this programme will be Rs. 41.3 lakhs.

iv) Provision of mobile laboratory-cum-training vans.

To improve science teaching at the primary stage and provide in-service training to a large number of teachers through well-trained staff, it is proposed to provide 150 selected educational districts in the country with a mobile van unit fitted with projector, a small laboratory and a library. Important topics of the syllabus will be ta taught by the staff of these mobile units in selected primary schools, where teachers of the neighbourhood primary schools will observe and discuss the teaching. Each van will be provided with a trained science graduate, an under-graduate and driver-cum-projectionist. The total cost of this programme will be Rs. 1.29 crores.

Middle Stage

Establishing 150 science training centres in selected science colleges.

The Kothari Commission has recommended that science from the middle stage should be taught as individual disciplines of physics, chemistry and biology in place of the existing courses of general science. In order to achieve this, each middle school with a single section would need at least two science and mathematics teachers competent to teach modern courses of physics, mathematics, chemistry and biology. To train such teachers, it is proposed to run a new two year course for matriculates who will be trained as science and mathematics teachers for middle classes.

150 such training centres are proposed to be opened. The yearly intake of each centre will be 80. The non-recurring expenditure on buildings, hostel facility and equipment is estimated at Rs. 5 lakh per centre. The training cost is estimated at Rs. 600 per annum per trainee. Each trainee will be paid a stipend of Rs. 500 per year. These centres will prepare candidates for a course leading to diploma in science education to be awarded by the universities. The course will consist of content, methodology, and practical work. The cost of this programme will be Rs. 7.50 crore non-recurring. The recurring cost of the phased programme will be Rs. 9.24 crores.

vi) In-service training programme for existing teachers of science and mathematics working in middle schools

There are at present about 90,000 middle schools where science is taught as an integrated course of general science. In order to train the existing teachers of these schools to teach science course as individual disciplines of physics, chemistry, mathematics and biology, a two-month in-service training course will be organised through selected teacher training colleges. During the plan period about 40,000 teachers at the rate of two teachers each from a middle school will be trained to handle the new courses in science and mathematics. The cost of this phased programme will be Rs. 89 lakhs.

vii) Provision of a science study-room and equipment for senior elementary schools.

In order to have desired effect through a programme of science teaching, it is necessary for children to have first-hand experiences of science. T To achieve this, it is proposed that 20,000 selected middle schools may be assisted to build a science study-room and equip it fully for showing demonstrations and doing some individual pupils' laboratory work. A sum of Rs. 5,000 per school as building grant on a matching basis and another Rs. 5,000 for purchase of furniture, storage facility and equipment is proposed. The cost of this programme will be Rs. 2 crores (non-recurring).

Secondary Stage

viii) Strengthening of State Institutes of Science Education.

State Institutes/Units of Science Education were established towards the end of the Third Plan to develop curriculum in Science and Mathematics to prepare better textbooks, teachers' handbooks, etc. to organise in-service training courses and generally to assist the State Directorates of Education in all matters relating to the teaching of science in schools. In some of the States, the Institutes have not been set up so far and in others,

the Institutes are not staffed and equipped properly. It is proposed to provide for the development of the Institutes a sum of Rs. 3 lakhs every year. For 20 Institutes, the cost will come to Rs. 3.00 crores.

ix) Science Units in the Directorate of Education.

At present there are no technical units in the Directorates of Education to guide and administer the development programmes in the field of science education. This is proving to be a major hinderance in the efficient implementation of these programmes. Accordingly, it is proposed to set up 20 science units at a cost of Rs. 50,000 per year. The cost will be Rs. 50 lakhs.

x) Science Supervisors in the Districts.

The need for science supervisors attached to the District Inspectors' office is now accepted. It is proposed to appoint about 150 science supervisors during the Fourth Plan at a cost of Rs. 12,000/- per annum per supervisor. The cost of this programme phased over a period of 5 years will be about Rs. 54 lakhs.

xi) Pre-service training

The present arrangements for pre-service training of science and mathematics teachers have been found far from satisfactory as in these courses very little emphasis is laid on the content of science. It is considered advisable to entrust this work to the Universities who with the assistance of their science and education departments can organise specialised pre-service courses for content and methodology. To begin with, these courses may be organised in 15 universities during the Fourth Plan. A sum of Rs. 75 lakhs as non-recurring at the rate of Rs. 5 lakhs per centre for building additional hostel accommodation, equipment, etc. is provided for this Scheme. The recurring cost of the phased programme for staff and stipends will be Rs. 1.40 crores.

xii) Construction of additional laboratories.

According to the Second All India Educational Survey, there are more than 8,000 secondary schools where there are no laboratory facilities available. As science is proposed to be made a compulsory subject for all students sthroughout the school stage, it will be necessary to assist these institutions to construct new laboratories. The average cost of construction of a composite laboratory with its fixtures and fittings is estimated at Rs. 15,000/-. The total cost of providing laboratories to these existing schools will be Rs. 12 crores. Besides this, it is expected that 4,000 new secondary schools will come up during the planperiod. The responsibility for providing laboratory buildings may be taken up by the State Governments for which an additional provision of Rs. 6 crores will be needed.

xiii) Supply of equipment to new and existing institutions.

It is proposed to provide science equipment at a cost of Rs. 10,000 per school to all new high schools (about 2000 in number) and assist another 8000 existing high schools at a cost of Rs. 6,000 per school. This will enable these schools to teach science up to Class X as recommended by the Kothari Commission. The total cost of this programme will beRs. 8.8 crores.

xiv) Provision of laboratories, equipment for elective courses in science in 12-year schools.

Some of the States have decided to adopt the higher secondary scourses of two years' duration as recommended by the Kothari Commission. The Higher Secondary classes will be started either in the colleges or in selected good schools. In some of the States 11-year higher secondary classes already exist. Some of these schools may be up-graded to the new pattern. It is, therefore, proposed to establish elective courses in science in the two year higher secondary classes in about 500 higher secondary schools at an average cost of Rs. 1.0 lakh per school to cover thecost of laboratory rooms, science equipment, books, etc. The cost of this programme will be Rs. 5 crores.

xv) Provision of Science equipment for the laboratories of the existing teacher training colleges.

Inspite of starting new pre-service programmes for secondary school science teachers, a majority of the science teachers for the high schools will co continue to be prepared for quite some time by the existing teacher training colleges. Efforts are being made to improve the science and mathematics programmes being offered in these colleges by including the content of science along with its methodology. The training colleges have, however, no facilities of laboratory to develop the practical skills and demonstration techniques in future teachers of science. To enable them to handle such programmes, it is proposed that each of the existing 250 teacher training colleges may be assisted to equip science laboratories for physics, chemistry and biology and develop a small workshop at a cost of Rs. 20,000 per institution. A sum of Rs. 50 lakhs is proposed for this purpose.

xvi) In-service training programme for secondary school teachers.

With the up-grading and modernising of the science curriculum, it will be necessary to retrain the existing science and mathematics teachers of the senior secondary classes. It is proposed to train 10,000 secondary school teachers through a two-month in-service course through selected teacher training colleges with the active assistance of science colleges. A provision of Rs. 72 lakhs is proposed for this programme.

21. The out-of-class science activities proposed for inclusion in the Fourth Plan are detailed below:

i) Establishing Science Clubs in Secondary Schools.

The science courses offered through the school curriculum are mostly directed to cater to the needs of the average learner. Experience in different countries has shown that the science clubs provide an excellent forum to cater to the needs and to arouse the curiosity and nurture the talent of the gifted students in science. It is proposed that 10,000 secondary schools may be assisted during the plan period with grant of Rs. 1,500 per school to establish science clubs. A sum of Rs. 1.5 crores is proposed for this purpose.

ii) Organising Science Fairs at various levels.

To constantly energise the science clubs, it is necessary to provide them with a forum to exchange ideas and to inculcate a spirit of competition for constant improvement in their performances. The science fairs provide an opportunity to achieve these objectives. It is proposed that during the plan period each district should organise a science fair for its schools and similarly each State should also organise a science fair where the district competitors could compete and share their experiences with other schools. The State Institute of Science and the district supervisors can organise these activities at the State and District levels. The NCERT may be entrusted to organise a National level science fair which will provide a forum to locate gifted students in science. A provision of Rs. 10 lakhs for the plan period is proposed for this activity.

iii) Training courses for science club sponsors.

Experience during the second and third plan periods has shown that the activities in science clubs become static at the level of classification, collection, duplication and model making, unless the science clubs sponsors are oriented to develop new ideas. It is proposed that the State Institutes of Science should organise orientation courses for science clubs sponsors of those schools which will receive assistance for establishing science clubs. A provision of Rs. 10 lakhs is proposed for this activity.

iv) Establishment of State Science Museums.

Science museums play a very important role in helping the children as well as adults develop a correct understanding of science and appreciate its role in life and national economy. It is proposed that during the Plan period 10 such units may be developed at the state headquarters at a cost of Rs. 5 lakhs per unit. These State Museums will ultimately provide an excellent forum to organise the State level science fairs and give impetus to science club movement in general. The cost for this scheme during the Plan period will be Rs. 50 lakhs.

Conclusions

22. A statement showing the details of the provision suggested for various schemes of science in the Fourth Plan is given in Appendix A.

23. The desired objectives would be achieved only if all the schemes proposed for science education are properly coordinated.

24. At present a number of agencies like the N.C.E.R.T., N.S.C.E. and U.G.C. at the national level and S.I.Sc. Edn., Science Units, State Institutes of Education and different school boards at State level are working on science curriculum and other related programmes. All their work needs to be coordinated towards a total national programme to avoid overlap and duplication. Up-grading and modernisation of syllabi, making available the necessary instructional materials, providing necessary physical facilities, training of teachers and providing an effective supervision will all have to go hand in ahand. For this purpose an adequate machinery at the State level will have to be developed to ensure a proper coordination and implementation of the various schemes from the beginning of the plan period. Simultaneously it will be necessary to encourage and involve professional organisations of science teachers in the total task of the development of science education.

25. The entire success of theprprogramme would depend on the availability of motivated teachers of science. Unfortunately, there has been an acute shortage of science teachers and the present emoluments have not attracted an adequate number of teachers to work in rural schools. Another factor has been that many new avenues of employment with higher emcluments are now available to science graduates. New incentives may therefore be provided to science graduates to join the teaching profession. There could be advance increments or higher salary scales. This matter will have to be considered by the State Governments to ensure an adequate supply of science teachers.

APPENDIX A

Details of expenditure on various proposed schemes on School Science Education in the Fourth Plan.

I. Elementary

i) Laboratory and workshop equipment and books for 1400 training institutions @ Rs. 10,000/- — Rs. 140.0 lakhs

ii) Science kits to 21,000 selected primary schools @ Rs. 200/- — Rs. 42.0 lakhs

ii) Inservice training of 21,000 primary school teachers - Two month course for batch of 30 at 700 centres

Cost of one course

a) T.A. of 30 participants @ Rs.10/-	Rs. 300/-
b) Boarding of 30 participants @ Rs. 75/- per month	Rs. 3,500/-
c) Lodging of 30 participants @ Rs. 200/-	Rs. 400/-
d) Chemicals, contingencies including workshop for improvisation, raw material etc.	Rs. 300/-
e) Honararium to two higher secondary school teachers @ Rs.75/- per month each and Rs.25/- per month for Headmasters/Principals	Rs. 350/-
f) Honararium for clerical and laboratory staff	Rs. 50/-
	Rs. 5,900/-

Total - 700 such courses — Rs. 41.3 lakhs

iv) Mobile van cum laboratory - 150 units:

Cost of one unit

a) Van	Rs. 25,000/-
b) Projector and filmstrip projector	Rs. 5,000/-
c) Generator	Rs. 1,000/-
d) Wheeled laboratory table fitted with water cistern and basin	Rs. 200/-
e) Equipment portable kits in two boxes chemical etc.	Rs. 1,000/-
f) Films and filmstrips	Rs. 5,000/-
g) Charts and models	Rs. 2,000/-
h) Books	Rs. 800/-
	Rs. 40.000/-

Staff

One B.So., L.T.	= 300 x 12 = 3600 + 3 x 25 x 12	=	900
One High School LTC	= 150 x 12 = 1800 + 2 x 25 x 12	=	600
One Driver-cum Projectionist	= 150 x 12 = 1800 + 2 x 25 x 12	=	600
One conductor-cum-bearer	= 120 x 12 - 1440 + 2 x 25 x 12	=	600
	8640 + 2700		

Pay	Rs. 11,340/-
Petrol charges	
Van+Generator	Rs. 2,000/-
Maintenance	Rs. 1,000/-
Contingencies	Rs. 500/-
Rec. for one year	Rs. 14,840/-
For three yrs.	Rs. 44,520/-
Increments	Rs. 980/-
	Rs. 45,500/-

Total: (Non-rec.) Rs. 60.0 lakhs
(Rec.) Rs. 69.0 lakhs

II. Middle

i) 150 pre-service training centres in selected science colleges

a) Laboratory and hostel building equipment, furniture @ Rs. 5 lakhs (N.R.) Rs.750.0 lakhs
b) Staff salary and other recurring expenditure (50 institutions) each year for the first three years (Rec.) Rs.925.0 lakhs

ii) In-service training of middle school teachers

Cost of one course

a) T.A. of 40 participants @ Rs. 20/-	Rs. 800/-
b) Boarding of 40 participants @ Rs.75/-	Rs. 6,000/-
c) Lodging of 40 participants @ Rs.200/-	Rs. 400/-
d) Chemicals, contingencies including workshop for improvisation, raw materials etc.	Rs. 500/-
e) Honararium to training college staff @ Rs. 600/-	Rs. 1.200/-
	Rs. 8,900/-

Total for 1000 courses Rs. 89.0 lakhs

iii) Science study room and equipment for middle schools — Rs.200.0 lakhs

a) Building @ Rs.5000 per school for 20,000 science study rooms — Rs. 100 lakhs
b) Furniture, storage and equipment @Rs.5,000/- for 20,000 schools — Rs. 100 lakhs

III. Secondary

i) Strengthening of State Institutes additional staff and programmes for State Institutes @ Rs. 3 lakhs per year for 20 units — Rs.300.0 lakhs

ii) Science units in the Directorate of Education - 20 units @ Rs. 50,000/- per year — Rs. 50.0 lakhs

iii) Science supervisors in Districts:

150 District Science Supervisors with supporting staff and contingencies @ Rs.12,000 per annum per unit phasing - 50 supervisors each year beginning from the second year — Rs. 54.0 lakhs

iv) 15 University training centres for science and mathematics teachers: — Rs.215.0 lakhs

a) Building, additional hostel accommodation equipment etc.@ Rs.5 lakhs per school(NR) Rs. 75 lakhs
b) Recurring cost on staff contingencies phasing of 5 centres each year beginning from second year — Rs. 140 lakhs

v) Construction of additional laboratories — Rs.1800.0 lakhs

a) Laboratories in 8000 existing secondary schools @ Rs.15,000/- — Rs.1200 lakhs
b) Laboratories for proposed 4000 new high schools @ Rs.15,000/- — Rs. 600 lakhs

vi) Equipment to new and existing institutions — Rs.880.0 lakhs

a) Equipment to new 4000 high schools @ Rs. 10,000/- — Rs. 400 lakhs
b) Equipment to existing 8000 high schools @ Rs. 6,000/- — Rs. 480 lakhs

vii) Laboratory building, equipment for elective course in 12 year schools — Rs.500.0 lakhs

viii) Strengthening laboratories of existing teacher training colleges

Supply of laboratory and workshop equipment and science books to 250 training colleges @ Rs. 20,000/- per college — Rs. 50.0 lakhs

ix) In-service training of secondary school teachers.

Expenditure on a two month course for Science teachers from Secondary Schools for batches of 50, through 30 selected training colleges.

a) T.A. of 50 participants @ Rs.50/-	Rs. 2,500/-
b) Boarding of 50 participants @ Rs.5/- per day	Rs.15,000/-
c) Lodging of 50 participants @ Rs.500/- p.m.	Rs. 1,000/-
d) Chemicals, contingencies including field trips, workshops, raw materials etc.	Rs. 2,000/-
e) Hon. to college lecturers and clerical staff of the training college	Rs. 500/-
	Rs.20,000/-

Cost of 200 such courses — Rs.40,00,000/-

Salary of part time lecturers @ Rs.3200/- for each college for two courses — Rs.32,00,000/-

Total for all courses — Rs. 72.0 lakhs

IV. Out of class science activities

i) Science clubs in secondary schools 10,000 clubs @ Rs. 1500/- per school — Rs.150.0 lakhs

ii) Science fairs:
350 district level fairs @ Rs. 250/-
20 State level fairs @ Rs. 5,000/-
1 National level fair @ Rs. 12,500/-

Total — Rs. 10.0 lakhs

iii) Training of science lclub sponsors 80 courses for 20 sponsors each @ Rs. 2,500 per year — Rs. 10.0 lakhs

iv) Science museum:
10 museums @ Rs. 5 lakhs each — Rs. 50.0 lakhs

Grand Total Rs.64.57.30.000

II. UNIVERSITIES AND COLLEGES

Present position

1. A notable feature of higher education in India in the past two decades has been a relatively rapid increase in the number of persons graduating in science and technology. It represents a growing awareness and desire for education in science and science-based courses. It is also stimulated by the larger possibilities, on the whole, of employment open to graduates of science and technology. The following statistical data relating to science and science-based education at the university level will be of interest. The total enrolment in 1965-66 was about 1.73 million and this included 0.75 million in science and science-based courses. This represents 45% of the total enrolment. The break-up of the enrolment is indicated below:-

1965-66	I. Total Enrolment :	17,28,773	
	II. Science-based Courses:	7,48,344 :	45%
	a) Science	5,65,254	32.7%
	b) Eng./Tech.	8,555	4.9%
	c) Medicine	70,088	4.0%
	d) Agriculture	51,190	3.0%
	e) Vet. Science	6,257	0.4%

2. The position with regard to post-graduate and research enrolment in the universities is as shown below:-

1965-66	Post-graduate and Research Enrolment		
	I. Total Enrolment :	1,00,463	
	II. Science-based courses:	33,048	33%
	a) Science	24,270	24.1%
	b) Eng./Tech.	1,818	1.8%
	c) Medicine	3,429	3.4%
	d) Agriculture	3,058	3.0%
	e) Vet. Science	473	0.5%

3. The distribution of this enrolment in the universities according to the faculties and stages is given below:-

1965-66: Enrolment according to faculty and stage in the university level.

1.	Total 2.	I Degree level 3.	Post-graduates 4.	Research (including diploma) 5.	Pre-Professional 6.
I. All Courses	1728773	1590673	91830	31039	15231
II. Science-based Courses	848344	723379	28954	10780	15231
a) Science	565254	540727	20858	3669	-
b) Eng./Tech.	85555	74216	1540	2642	7157
c) Medicine	70088	55812	3336	3893	7047
d) Agriculture	51190	47063	2797	466	864
e) Vet.Science	6257	5561	423	110	163

4. For purposes of comparison, it would be worthwhile to take the position of enrolment in science and science-based courses for a five-year period 1961-62 to 1965-66. The position is as indicated below:-

Comparison for five year period: 1961-62 to 1965-66.

1.	1961-62 2.	1962-63 3.	1963-64 4.	1964-65 5.	1965-66 6.	%im-creas 7.
I. Total	11,55,380	12,72,666	13,84,697	15,28,227	17,28,773	49.6
II. Science-based	4,64,527	5,41,460	6,10,388	6,68,497	8,48,344	82.6
a) Science	3,36,722	3,86,374	4,35,925	4,78,702	5,65,254	67.9
b) Others	1,27,805	1,55,086	1,74,463	1,89,795	2,83,090	121.5

5. The output of science graduates and in science-based professional courses has increased nearly fourfold in a period of about 15 years. The output of the post-graduate level over the same period has been almost seven times and that of the Doctorate holders in Science and Technology nearly six times. The number of degrees awarded in 1950 and 1965 and expressed as percentage of the corresponding age-group are given in the following table :-

	No. of degrees awarded		Percentage of the corresponding group		Average annual (compound rate of growth)
	1950	1965	1950	1965	
1.	2.	3.	4.	5.	6.
B.Sc.	9,628	38,230	0.14	0.44	9.6%
M.Sc. (excluding Mathematics)	851	5,525	0.013	0.067	13.3%
M.A./M.Sc. (Mathematics)	251	2,292	0.004	0.028	15.8%
Bachelor Degree in Technology (Engineering and other subjects)	1,660	9,739	0.025	0.12	12.6%
Bachelor Degree in Agriculture and Veterinary Science	1,100	6,599	0.017	0.08	12.7%
Doctorate Degree in Science and Technology	100	522	-	-	12.0%

6. It would be evident from the comparison given in Para 4 above that the increase in enrolment in Science courses and Science-based courses is of the order of 68% and 83% respectively, against an overall increase of approximately 50% in a five-year period. In the present situation where the attraction towards engineering courses is likely to be less at least in the course of next five years and a phased ereduction in intake has been suggested by the Government of India, the enrolment in the Science courses at the university level will increase at a greater rate. Even otherwise it is recognised that it is desirable to to have a first degree in Science before admission is made to the engineering

courses and this suggestion is likely to find increasing acceptance in the next few years. All this would require a concerted approach to make facilities available for science education in the universities and colleges reasonably adequate if these additional numbers have to be accommodated and given the education in science which is required for making them suitable for pursuit of professional courses at a later date.

Another factor which should be reckoned is the existing state of regional imbalances in science and science-based education in the different States in the country. Regional imbalances in science and science-based education is a feature associated with a developing country like India. There is wide variation in the facilities for science and science-based education amongst the different States in the country. Enrolment in science courses expressed per unit of the total population is highest in the Southern States and is of the order of 2,200 per million and ranges down to about five hundred per million in some of the Northern States. This regional imbalances in science education and even more so in technology has a direct effect on the pace of industrial development in different regions of the country. Efforts need therefore to be made to bring an adequate matching between industrial and agricultural development and the potential of a region on the one hand and the availability of facilities for education in science, technology and agriculture on the other. This would mean that in those States where the enrolment in science is far above average, the main emphasis will have to be on the improvement of quality and in the case of those States where the enrolment is much below the average, the attention has to be given not only to increase this to the required level numerically but also to provide for the quality in order to bring them to the required standard.

7. This would mean providing for necessary physical facilities as well as training of teachers required for providing instruction to these increasing number of science students at different levels of university education.

8. Besides the regional imbalances in enrolment in science education in the country, the other major problems relating to science education are listed below:-

i) Inadequate and low standards of instruction and outdated curricula and examination system.

ii) Problems of teacher training and retraining.

iii) Inadequate facilities of scientific equipment and textbooks.

iv) Wastage and under-utilisation of science graduates.

v) University type of research undertaken outside the universities.

vi) Research unrelated to economic and development needs of the country.

9. The university-based science complex in India is generally faced with the twin problems of expansion to accommodate increasing enrolments and the maintenance of proper standards. This is particularly true of the first degree level and more so in the colleges affiliated to the universities which account for more than 80% of the total enrolments Several programmes taken up for assistance to colleges providing science education at the first degree level, such as, the introduction of the three-year degree course, expansion of science education, assistance for improvement of laboratory and library facilities have helped to strengthen to some extent the essential base required for a purposeful science education; but viewed against the background of the enormous numbers of students seeking science education and the number of institutions to be covered, the efforts made so far have had only a very limited impact. It would, therefore, appear necessary that a selective approach for improvement of facilities in a limited number of colleges and university faculties should be initiated in the Fourth Plan period.

10. There is an urgent need, in general, for revising drastically the undergraduate and postgraduate curricula to bring them on par with the level and contents of the university courses in some of the scientifically advanced countries. The importance of field work and environmental studies in Biological and Earth Sciences needs to be stressed. Industrial and Agricultural applications of Science subjects should be clearly and forcefully brought out and listed in terms of local industries and experience accessible

to students. In the case of the physical sciences, proper balance needs to be maintained between the experimental and the theoretical aspects of education. In the fields of Chemistry Studies, areas such as Synthetics, Chemicals, Fertilisers, Pesticides, Chemistry of Natural Products, Petro-chemicals, Synthetic Fibres, should be more practical based and closely related to industry. There is an urgent need also to introduce an element of flexibility and innovation to encourage study of border line and inter-disciplinary subjects which are rapidly developing as in areas of major study and research. As one of the important steps towards linking education with practical life, it would be desirable for universities and engineering institutions to enrol qualified industrial workers for part-time education in science and technology through correspondence courses etc. The Examination System has to be reformed so that the assessment of the students performance continues throughout the academic year.

11. The problems indicated above have been dealt with the utmost care and detailed in the Education Commission's Report with reference wherever appropriate to the programme already undertaken or proposed to be undertaken by the University Grants Commission.

12. The emphasis, as has been the case in the past three plan periods, has to be on improvement of quality at the postgraduate level. The postgraduate courses occupy a key position in the university system and also represent a sector of manageable dimensions. Improvement of postgraduate education will have an immediate impact on the quality of teachers and good teachers have a multiplying effect on the quality and standard of the entire educational system. Better postgraduate education will also lead to better research. It has been pointed out by the Education Commission that the facilities for postgraduate education should be more than doubled within a period of five years, if the demands for science education at different levels of educational system as a whole have to be adequately met.

13. While the general approach to meeting the needs of science education in the universities and colleges would be to assess their needs for improvement of laboratory, library, workshop and other physical facilities and appointment of academic and technical supporting staff, it would be most essential to initiate as well as strengthen some of the programmes specifically aimed at improvement of quality of science education and research in the universities and colleges. Some of these programmes are listed below:-

1) Establishment of Centres of Advanced Study.

2) Development of selected institutions, selected courses of study in applied and inter-disciplinary subjects.

3) Curriculum Reforms and Examination Reforms.

4) Organisation of Summer Institutes, Refresher Courses and College Development Programmes.

5) Award of scholarships and fellowships for Advanced Study and Research.

6) Support for Scientific Research.

7) Production of Textbooks.

Establishment of Centres of Advanced Study

14. An urgent need in the field of higher education in India is the strengthening of postgraduate teaching and research and chanelling of the existing limited resources effectively for this purpose. The University Grants Commission has therefore undertaken in consultation with the universities a scheme for developing selected university departments for advanced training and research in certain specialities. The scheme is intended to encourage the pursuit of 'excellence' and team-work in studies and research and to accelerate the realisation of 'international standards' in specific fields. With this object in view it is proposed to give active support and substantial assistance to promising departments in the universities carefully chosen on the basis of the quality and extent of work already done by them, their reputation and contribution to research, and their potentiality for further development.

15. A beginning was made by providing assistance to certain university departments for obtaining competent and promising teachers and research workers and procuring essential equipment. To be viable, such centres of advanced study have to exceed a certain 'critical' size as regards their staff. The departments concerned would therefore have a fairly large staff of professors, readers and research associates/follows of outstanding ability and qualifications who are actively engaged in research and advanced training. A substantial proportion

of the team would be a kind of 'floating staff' coming to these centres for long or short periods on deputation from their universities/institutions and possibly from abroad. Adequately staffed and properly organised, these departments are expected to make an appreciable impact, direct and indirect, in raising the standards of teaching and research in our universities.

16. As they would be functioning on an all-India basis, they would attract teachers and scholars from all over the country and help in maintaining and strengthening the corporate intellectual life in the country. Another advantage accruing from the scheme would be that the personnel trained in the centres would in course of time be available for strengthening the staff of other university departments - thus helping to meet to some extent the present difficult position experienced by the universities in securing qualified and competent teachers in adequate numbers.

17. At present there are 17 centres of advanced study in Science subjects and 13 in Humanities and Social Sciences. They function on an all-India basis and are intended to serve as breeders of more such centres in the future - excellence breeding more excellence.

18. The establishment of Centres of Advanced Study or "centres of excellence" is a step of considerable significance in universities. In case, centres of this kind are not built within the universities, such institutions will inevitably grow or be provided outside the university system. The result would be grossly disadvantageous to the universities and would seriously weaken them.

19. The Education Commission has specially emphasised the need for establishment of more such centres of advanced study and also clusters of such centres within a few selected universities in related subjects to serve as national centres of training and research in worthwhile subjects as well as to accelerate programmes of inter-disciplinary and intra-disciplinary research.

20. The development of centres of advanced study/ can only be done if substantial assistance over a fairly long period can be provided centrally to the universities. The assistance for the Centres of Advanced Study at present is initially for a period of ten years and any assistance subsequent to that would be mainly for initiating new programmes rather than for consolidation.

This assistance over a ten year period can be further broken up into two phases: (a) The first five-year period where the emphasis would be to strengthen and bring to the critical size - one or two major groups in certain disciplines within the department and (b) the next five-year period to provide for suitable expansion of the facilities created in the first phase. On the basis of the past experience and the requirements, the capital expenditure required for each science centre would be of the order of Rs. 15 lakhs and a recurring expenditure of Rs. 3 lakhs over a plan period. This would mean that establishment of every new centre of advanced study in Science subject would require an outlay of Rs. 30 lakhs. This is in comparison to about Rs. 20 lakhs required for each Centre to be established in Humanities and Social Sciences subjects. On the basis of the requirements of the existing centres of advanced study and the new centres proposed to be established in the next five years, the total requirements would be of the order of Rs. 20 crores.

Development of Selected Institutions. Selected Courses of Study in Applied and Inter-disciplinary Subjects

21. The programme for the Centres of Advanced Study aims at developing training and research at an advanced level but will be restricted to a very wsmall number of university departments. Side by side with the development of such centres, measures must also be taken to ensure that the excellence generated in the centres of advanced study is gradually extended to other universities and affiliated colleges so that the standards in the entire system of higher education are upgraded in due course. Here again one is faced with the question of large numbers of institutions and students and a selective approach to limit such development to a few faculties in the universities and a few selected colleges within the country becomes necessary in view of the limited resources. There are at present about 70 universities and nearly 800 colleges providing for science education upto the first degree level and amongst this, most of the universities and about 20% of the colleges have facilities for post-graduate training also and some related research. The development of a few faculties in a science subject in a few selected universities and colleges on a selective basis would help bring them to the level comparable to those prevailing in good university institutions. Such development will no doubt involve considerable investment, both men and material, and naturally cannot be fully met within the available resources. The development of the faculties of

science particularly in basic science subjects and with emphasis on training at the undergraduate and the post-graduate level could be taken up in three or more successive phases by selecting suitable institutions which have reached a certain stage of development and making available to such institutions reasonably substantial funds to improve their laboratories, scientific equipment, libraries and providing qualified teachers in required numbers. Such concentrated attention and channelling of the available resources to a few institutions will yield positive results and make the required impact in the development of the science training programme at the first degree level.

22. If the science faculties in at least 1/4th of the existing universities have to be brought up to the required level, each such facult would require on an average Rs.50 lakhs for all its science departments. This would mean a provision of Rs. 750 lakhs for 15 such university faculties. Similarly the amount to be provided for each college science faculty should be of the order of Rs. 10 lakhs. This would require a provision of Rs. 1600 lakhs for 160 colleges to be included in the first phase of such development.

23. An allied problem is that of offering more accelerated courses of study in basic science subjects at the under-graduate level for potential scientists, particularly the young students selected under the N.C.E.R.T. scheme of Science Talent Search. It is suggested that such students may be given instruction in a more stimulating environment under the guidance of carefully selected teachers. If necessary the possibility of establishing a separate science college with adequate hostel facilities may be explored. Such institution should be given freedom to experiment with its own methods of teaching and evaluation. One of the Regional Colleges of Education might be selected for the purpose.

Support for scientific research in the Universities and Colleges

24. Besides the awards of scholarships and fellowships for new schdars to take up advanced study and research, it is essential to provide special support for teachers and groups of research workers to take up research projects in their own specialities. If research in basic sciences is not adequately supported within the university system, there is the inevitable danger of such research being done outside the universities and in a situation divorced from post-graduate teaching and lack of contact with fresh young and creative minds. The present situation is that the

university departments have to depend on the support available to them from various research organisations within the country to some extent and mainly for the support available from such sources as PL 480 research projects etc. Such reliance on outside support for basic scientific research in the university system is an unhealthy feature of the Indian universities. This has to be remedied as early as possible. By making a beginning to provide at least Rs. 1 lakh per annum for support of scientific research within the universities, this would mean a plan provision of Rs. 500 lakhs.

25. The importance of a comprehensive schclarships programme for under-graduate and post-graduate students in universities and colleges can hardly be over-emphasised. It would be necessary to initiate a comprehensive scholarship programme to encourage meritorious students to take up study of science subjects. The emphasis may be on loan scholarships so that a self generating fund may be created. In view of the fact, however, that the allocations for scholarships have been provided separately, no amount has been included in these estimates.

Summer Institutes, Refresher Courses and College Development Programmes

26. Another important programme initiated by the University Grants Commission relates to the organisation of summer institutes, seminars, symposia, refresher courses etc. designed for training and retraining of teachers. The programme of summer institutes, which has been taken up in collaboration with the National Science Foundation, U.S.A. has grown in numbers and impact over the past five years with the result that nearly 200 summer institutes, are organised in science subjects during the current year. The organisation of summer institutes for school teachers in the universities, apart from those organised for college teachers, brings the school teachers in close contact with the university teachers and helps the participants to improve their subject matter competence, learn new methods of teaching, use of educational materials etc. and in this way to reform their own teaching in their schools. Provision is also made for the organisation of summer institutes for the benefit of talented students in Science and Mathematics. The number of participants in these institutes for the past five years is over 7000 college teachers and 9000 school teachers.

27. The programme of summer institutes is supported by suitable projects of college development, student and teacher participation in short term research work and preparation of text-books and other educational material designed for improvement of teaching of science subjects at the school and college levels.

28. During the Fourth Plan it would not only be necessary to maintain the existing tempo of activity but to increase it considerably if the bulk of teachers in the schools and colleges who need to be refreshed is taken into account. The average expenditure per summer institute of about 40 participants is of the order of Rs. 50,000/-. If 200 summer institutes are to be organised annually for college teachers only, the plan provision required would be of the order of Rs. 500 lakhs.

Organisation of special short-term courses in Applied Science Subjects.

29. A good proportion of the science graduates (say roughly 50%) coming out of the universities are not gainfully employed in occupations which require a training or knowledge ofscience and most of them would be acceptable to industry, agriculture etc. if they are given a suitable short term training in certain applied science subjects which are job oriented. The Education Commission in its report has drawn attention to this fact and has also listed types of courses that could be offered to B.Sc.s as well as M.Sc.s. Courses of such type should be instituted in almost every university campus having faculties of science, engineering and agriculture and also medicine and should be organised on an inter-departmental collaboration basis by making use of the facilities already available to a large extent. Nevertheless certain special facilities would be required to be developed to suit the individual courses to be offered. If facilities for 10,000 graduates both B.Sc. and M.Sc. are to be provided for such short terms courses, the additional expenditure would be of the order of Rs. 1,000 per student i.e. a plan provision of Rs. 100 lakhs.

General development of science facilities in the Universities & colleges

30. In order to develop the existing science laboratories by providing suitable equipment in adequate numbers and science libraries and journals required for a purposeful instruction at the first degree level and also at the postgraduate level in the colleges and the universities, special provision has to be made over and above the average expenditure likely to be incurred at the higher education level.

This would include the increase in cost of scientific equipment to be obtained, replacement of obsolete and worn out equipment and some provision for fabrication of equipment in the workshops to be essentially developed in every science teaching institution in the university. This would require a per capita expenditure of Rs. 500 (Non-recurring) for about 9 lakhs students. During the Fourth Plan, the total requirement would be of the order of Rs. 4500 lakhs.

31. It is also essential that the faculty strength particularly the number of specialists in various branches of Science should be suitably increased. Further, really eminent science teachers should be appointed and allowed to work wherever the academic atmosphere is conducive to their work. For this purpose, supernumerary posts should be created and financed by the Central Government so that these teachers are not subjected to local pressures.

Special efforts for development of Mathematics.

32. The Education Commission has repeatedly drawn the attention to the immediate need of making a deliberate effort to place India on the world map of Mathematics. Besides establishing a few centres of advanced study in mathematics, at least some of the major departments of mathematics in the universities should be encouraged to take an active interest in providing instruction to specially gifted students in mathematics. For this purpose, the Education Commission has suggested establishment of one or two special secondary schools within the university system. If a beginning is to be made in this direction to provide for training of at least 100 gifted students with unusal mathematical ability annually in two such centres during the plan period and to provide for suitable scholarships and other facilities the expenditure would be of the order of Rs. 1 crore.

Development of instrumentation workshops, computer facilities, museums etc.

33. Every college and university department of science should be encouraged to develop workshop facilities so that the students would learn to use the workshop tools and get acquainted with some of the essential laboratory techniques and practices. Suitable incentives should be given to the institutions to develop the design and prototype of scientific equipment.

In our science departments a proper balance between experimental and theoretical aspects should be maintained and instruction in physical sciences should be essentially workshop and laboratory based. It is also necessary to emphasise field training in biological and earth sciences and to provide necessary teaching collections. Teaching collections are much more important than museums and should be built by students, staff and research scholars. The universities should be encouraged to build such museum collections related to the teaching programmes rather than acquire rare and unusual specimens from different countries.

34. A special effort would need to be made to provide facilities for computation and training in programming and computer technology in most of the major university centres. The Education Commission has desired that by the end of the Fourth Plan at period at least 25 to 30 universities should have reasonably good computers installed to serve their research community. It is estimated that the development of workshop/museum and necessary computer facilities would be of theorder of Rs. 2.5 to 3 crores with at least 30% of it in foreign exchange.

35. For the proper development of scientific research, there is need for a closer cooperation between the industry and scientific institutions. Universities in different regions may be encouraged to devote themselves to basic research work in science and technology which would come up after 5-10 years. A sum of Rs. 50,00,000 is recommended for the purpose.

36. Another important sector, which must be attended to is the preparation of text-books for college students. Suitable inducements may be given to groups of university teachers to undertake writing of text-books as well as small monographs on various scientific subjects.

37. The summary of the financial implications of the programmes proposed above for the improvement of science education and research in higher education is given below:-

Sl.No.	Schemes	Outlay proposed (Rs. in crores)
1.	Centres of Advanced Study	30.00
2.	Development of selected institutions and faculties.	23.50
3.	Support for scientific research in universities.	5.00
4.	Summer Institutes, etc.	5.00
5.	Short-term courses in applied sciences	1.00
6.	General development of science facilities.	45.00
7.	Special effort for development of mathematics	1.00
8.	Development of workshops, etc.	3.00
9.	Basic Research work for Industrial Development	0.50
	Total:	104.00

PLANNING COMMISSION
(Education Division)

TECHNICAL EDUCATION IN THE FOURTH PLAN

Introduction

There has been phenomenal expansion both at the first degree and diploma levels. The annual admission capacity of the technical institutions for the first degree courses in 1951-52 was about 4,790 students and that for diploma courses in polytechnics 6,200 students. The expansion since then has resulted in an admission capacity of about 24,000 students to the first degree courses and over 48,000 students to the diploma courses. Because of the present unemployment situation and other problems, the Government of India has suggested to the States to reduce admissions to the first degree and diploma courses on a selective basis. Admissions to institutions that have been started recently as also to those institutions, where the necessary instructional facilities are inadequate, may be restricted. The present plan is to bring down the admissions to about 15,000 to 16,000 students to the first degree courses and about 37,000 to 38,000 students to diploma courses. Should there be, in the course of the next 5-10 years, a radical change in the economic situation of the country demanding additional technical personnel, it would not be difficult to meet the situation by restoring the admissions to the original level, namely 25,000 to the first degree courses and 48,000 to diploma courses.

2. According to tentative estimates, there are today about 50,000 engineering graduates and diploma holders who are unemployed. On the basis of the present enrolments in technical institutions, each year about 15,000 graduates and about 25,000 diploma holders will turn out. During the Fourth Plan period 1969-74, the total additional stock of technical personnel available will exceed 200,000 engineering graduates and diploma holders. The total stock of graduate engineers and diploma holders who are in employment at present does not exceed 300,000. Therefore, the immediate concern should be to formulate adequate measures to effectively utilise the manpower that will be available during the Fourth Plan period. This responsibility must be shared fairly and squarely by authorities/organisations responsible for various economic development projects in the Fourth Plan. It would be necessary to ensure that such measures are reflected in the plans and programmes of the concerned organisations/authorities.

3. During the period 1969-74, we should make intensive efforts to consolidate existing technical institutions and improve the standard and quality of training. To that end, the following specific programmes would be undertaken:-

Faculty Development

4. Since the teacher is the heart of the programme of good education, we should organise on a continuing basis various programmes for the pre-service and in-service training of teachers. As for pre-service training, we should designedly reorient our present programmes of training teachers for engineering colleges to suit the actual needs of institutions. We must bring to the training centres serving teachers who have not had the benefit of post-graduate training and prepare them for the Master's Degree and also equip them with professional competences. This would require a practical arrangement with engineering colleges to get the teachers on long study leave of two-three years. During that period, the colleges should have adequate supernumerary posts to take care of the normal teaching work. An extension of the same process will include preparing selected teachers for the Ph. D. Degree and equipping them for higher faculty positions. For the in-service training of teachers, a wide range of programmes are needed. These include summer institutes, sequential courses, practical training or apprenticeship in industry, seminars and workshops and so on. A network of facilities for in-service training on these lines must be organised throughout the country.

Reorganisation of Diploam Courses

5. Diversification of diploma courses and re-orienting them functionally to the training of technicians for industry is an urgent problem. To that end, our polytechnics should be brought designedly into intimate relationship with industry for conducting sandwich courses, co-operative courses, part-time courses and so on. We must identify on a continuing basis the precise needs of industry for technicians and reflect those needs in the types of courses to be conducted by polytechnics, their curriculum and methodology. A build-in flexibility in our polytechnic education is needed to enable the institutions to be responsive to industrial needs. For that purpose, we must organise at selected centres special groups for curriculum development, preparation of teaching units and instructional materials, including text-books and designes of instructional aids. Further, efforts must be made to train serving teachers for the new curricular changes and equip them with necessary competences for new forms of polytechnic education. The training programme should also include organised apprenticeship or practical training for teachers in industry and other organisations.

Postgraduates Engineering Studies and Research

6. Although a good beginning has been made in this field, through our Institutes of Technology and other centres, much still remains to be done to consolidate the courses and bring them upto the highest standards possible. We have today over 2,000 places for post-graduate courses and research but the necessary instructional facilities including faculty development have still to be organised. In extension of the programme and to establish first rate centres of post-graduate engineering studies and research, we must select 8-10 well established engineering colleges that have experience of post-graduate activity and develop them into Institutes of Technology. Preliminary discussions on this question have already been held and the Government has agreed, in principle, to develop about 10 established engineering colleges in different parts of the country into Institutes of Technology in the next five years.

U.G.C.'s Assistance to University Departments

7. It has been estimated that the provision required for the development of university departments in engineering and technology, which are financed through the University Grants Commission an amount of Rs. 12.3 crores would be needed in the Fourth Plan. Provision has also to be made for the development of Indian Institutes of Science, Bangalore.

Curriculum Development and Preparation of Instructional Materials including Laboratory Equipment

8. An all-out effort should be made at selected centres for the development of curriculum and preparation of instructional materials for the first degree and diploma courses. For degree courses, our Institutes of Technology, in association with selected engineering colleges in their respective regions would be very good centres. For polytechnics, our Technical Teachers Training Institutes in association with selected polytechnics in their areas would be the best centres. Groups of experts who have an understanding of the problem of engineering education and industrial needs should be set up at these centres to work intensively on curriculum development and preparation of instructional material. Simultaneously, they should also work on designing scientific equipment and apparatus needed by technical institutions for their laboratories. Prototype of apparatus and equipment should be made and their production should be undertaken either at a central workshop or in regional workshops to be set up specifically for the purpose.

Apprentcieship Training in Industry

9. The present unemployment among engineering graduates and diploma holders has not only indicated the weaknesses in our manpower policies but also emphasised the importance of apprenticeship training in industry. On an emergency basis, we have increased the training facilities from about 2,000 places to over 7,000 places. It is proposed to organise 10,000 to 12,000 places in the Fourth Plan with the cooperation and support of industry. The curx of the problem of good apprenticeship, however, is adequate

supervision. Lack of well laid out programme of training and its supervision by industry is the chief weakness of our present scheme and every effort should be made to correct it duringthe Fourth Plan period. To that end, we must set up apprenticeship boards in each State/region in close collaboration with industry and service the boards with adequate technical personnel. It is proposed to amend the Apprentice Act of 1961 to include the training of engineering graduates and diploma holders. The Central Apprenticeship Council duly reconstituted together with State Regional Apprenticeship Boards should be in complete charge of the practical training programme.

Vocationalisation of Secondary Education

10. This is an area in which new ground should be broken in the light of the recommendations of the Education Commission and on the basis of our experience of Junior Technical Schools, multi-purpose schools, technical high schools, and vocational schools. A detailed scheme for reorganising and developing secondary technical education has been formulated by the Ministry and sent to all State Governments. Keen interest has been evinced in the scheme by certain States and A.I.C.T.E at its meeting held on 25th May, 1968, recommended to them to adopt or adapt the scheme to suit their needs and re-organise their vocational/technical schools. The important point is that there should be a close tie up between technical vocational schools and DGET for purposes of trade certification and apprenticeship in industry on the one hand, and on the other, with polytechnics for training the correct type of entrants to diploma courses. It is also important not to impose from the top a rigid, uniform and highly structured programme on the States but to leave it to the States to take the main initiative to formulate their own programmes according to their needs and implement them within their own resources.

Setting up National Manpower Board

11. It has been recognised that there was need for setting up a National Manpower Board to formulate the national manpower policy and to assess manpower requirements for thefuture so that the expansion of technical training programmes could be modified from time to time in the light of that assessment.

Financial Outlays for Technical Education Programmes

12. To complete the schemes that have already been undertaken, and for new schemes to be initiated along correct lines, an outlay of Rs. 213.00 crores is needed, Rs. 107.00 crores in the Central sector and Rs. 106.0 crores in the States' sector. The tentative estimate for individual schemes are as indicated in the attached statement.

FINANCIAL OUTLAYS FOR THE FOURTH FIVE YEAR PLAN OF TECHNICAL EDUCATION

	Estimate in Rs. crores
I. CENTRAL SECTORS	
A. Central Government Institutions	
1. Indian Institutes of Technology	
For completion of schemes already undertaken For further development including advanced centres in aeronautics, materials science, etc.	10.0
2. Indian School of Mines, Dhanbad	0.5
3. National Institute of Foundry and Forge Technology	1.0
4. Central Institute of Printing, Technology	0.5
5. All Indian Institutes of Management, Calcutta and Ahmedabad	0.5
6. Centre for Industrial Design (at IIT, Bombay)	0.5
7. School of Planning and Architecture	
For completion of schemes For further development	0.5
8. National Institute for Training in Industrial Engineering	0.25
B. Development Programmes for Engineering Studies including Post-graduate Courses and Research	
9. Development and consolidation of post-graduate courses and research in engineering and technology in State and non-government institutions	10.0
10. Upgrading to selected engineering institutions for advanced studies and research on the pattern of IITs.	10.0

11. Part-time degree and diploma courses (completion of schemes already sanctioned) 1.0

12. Development of non-government technical institutes according to schemes already approved and in process of implementation (Central Aid) 5.5

13. Practical Training of graduates and diploma-holders (Expanded Programme) 16.0

14. Management Studies at universities and other centres. 2.0

15. Development of Regional Engineering Colleges (completion according to original plan and for specialised courses) 10.0

16. Loans for construction of hostels(completion completion of projects already approved and for limited expansion of hostel accommodation) 10.0

17. Specialised courses to be conducted in cooperation with industry as pilot projects and refresher courses for personnel from industry. 1.0

C. Quality Improvement Programmes through Central Effort

18. Technical Teachers' Training for college level teachers, in-service training, summer institutes and other programmes for faculty development both for college level and polytechnic teachers. 6.0

19. Technical Teachers Training Institutes for Polytechnic Teachers. 4.0

20. Research in technical education including curriculum development, preparation of instructional materials and text-books, design of laboratory equipments etc. 2.15

21. Improvement of salary scales of technical teachers (Spill-over of commitments) 1.0

Other miscellaneous items including planning and supervision at the Centre. 0.5

D. Programmes Implemented by U.G.C.

23. Development of technical education in university institutions including post-graduate courses, management studies etc.(on-going programmes) 12.3

24.	Indian Institute of Science, Bangalore	1.0
	(For all other new programmes to be undertaken in universities provision has been made under appropriate items)	
	TOTAL OF THE CENTRAL SECTOR SCHEMES	Rs.107.00 crores

II. STATE'S SECTOR

25.	Development of technical institutions for the first degree and diploma courses according to schemes already undertaken and in process of implementation.	60.0
26.	Revision of staff structure in technical institutions.	5.0
27.	Construction of staff houses	5.0
28.	Scholarships to students	2.0
29.	Students' Welfare and Amenities	2.0
30.	Diversification of diploma courses, reorganisation of polytechnic education including Commerce and consolidation of polytechnics.	12.0
31.	Reorganisation of technical vocational schools and vocationalisation of secondary education.	15.0
32.	Other schemes of technical education including planning, administration and supervision.	5.0
	TOTAL OF STATES PLAN SCHEMES	Rs. 106.0 crores
	TOTAL FOR TECHNICAL EDUCATION	Rs. 213.0 crores

ANNEXURE XIII

PLANNING COMMISSION
(Education Division)

Central and Centrally Sponsored Sector

(Rs. crores)

	Sub-head	Total	State	Central	Centrally sponsored	Central (Columns 4+5)
	1.	2.	3.	4.	5.	6.
1.	Elementary Education	330.00	329.83	0.17	-	0.17
2.	Secondary Education	201.00	200.98	0.12	-	0.12
3.	University Education	255.00	82.50	172.00	0.50	172.50
4.	Teacher Education	120.00	102.35	17.65	-	17.65
5.	Social Education	40.00	22.80	3.20	14.00*	17.20
6.	Cultural Programmes	20.00	5.00	15.00	-	15.00
7.	Languages and Book Production	50.00	10.00	10.00	30.00	40.00
8.	Physical Education	30.00	10.00	20.00	-	20.00
9.	Educational Administration	22.00	20.40	1.60	-	1.60
10.	N.C.E.R.T.	10.00	-	10.00	-	10.00
11.	Vocationalisation of Education.	4.00	-	4.00	-	4.00
12.	Other Schemes	5.00	2.00	3.00	-	3.00
13.	Technical Education	213.00	106.00	77.00	30.00	107.00
	Total:	1300.00	891.76	333.74	74.50	408.24

* Functional Literacy: This is part of an integrated programme of Functional Literacy and Farmers' Education. Under Agriculture this has been shown as a Centrally sponsored programme. This has been accepted and is likely to be the position in Education also.

PLANNING COMMISSION
(Education Division)

Education Fourth Five Year Plan - Recommendations of the Planning Group on the Report of the Steering Committee

The Planning Group while discussing the report of the Steering Committee, desired that the various alternatives or choices before the country in the field of educational development might be posed squarely with their implications to enable a fruitful debate to take place on the subject.

Basic considerations

A certain number of considerations will have to underlie possible alternatives. These are:-

(1) The inevitable expenditure must be met. This consists of maintaining the present momentum (leaving out the abnormal interrugnum of 1966-69) of educational development and providing for the commitments already entered into. The present momentum may again be reviewed from two angles: qualitative improvement and quantitative expansion. So far as quantitative expansion is concerned, it was agreed that providing for expansion on the basis of the past trend of increase in enrolment, which was a measure of the social demand for education, might be regarded as a priority in the sense that it might be difficult to resist it even if it might be desirable to do so on other considerations. Qualitatively, roughly speaking, it would be necessary to provide at least the expenditure which was incurred on these programmes in the Third Plan after applying the correction factor of increase in prices. The maintenance of the tempo of existing schemes does not rule out - as a matter of fact requires - the possibility of dropping some schemes that may have become redundent or comparatively unimportant.

(2) As the demand for resources will always be greater than their availability, it is essential to provide for all the economies that are possible to effect through the use of improved technologies, a more intensive utilisation of facilities and creation of those facilities that are required more urgently in the economy or are more significant from the point of view of greater national cohension, as a first charge on the finances available.

(3) For the same reason, it is essential to tap new resources in the community for educational development by the stimulus of suitable organisational changes such as linking the school more effectively with community needs, devising a machinery where the fruits of taxation are assured for the communities/ organisations which bear its burden, decentralisation of administration so that greater initiative is placed in the hands of the community concerned and rights and responsibilities are more closely linked, etc.

Inevitable expenditure

3. The inevitable expenditure, duly rationalised in the light of the above considerations, is indicated below:-

Table 1. Inevitable Expenditure

		(Rs. crores)
Elementary Education	..	430
Secondary Education	..	195
University Education	..	195
Teacher Education	..	25
Social Education	..	12
Cultural Programmes	..	15
Physical Education	..	10
Languages and Book Production	..	28
Administration	..	10
NCERT	..	5
Other Programmes	..	5
Technical Education	..	150
Total	..	1080

4. The additional enrolment in the major sectors that will be obtained by the above expenditure will be as follows:-

Table 2. Additional Enrolment in Major Sectors

	Unit	Third Plan (additional achievement)	Fourth Plan (targets - additional)
Classes I-V	lakhs	165	50
Classes VI-VIII	lakhs	38	60
Classes IX-XI	lakhs	25	33
University Education	lakhs	5	9
Technical Education: admission capacity	'000		
Diploma level		25	(-) 10*
Degree level		11	(-) 8*

* As regards Technical Education, the Ministry of Education has advised the States to reduce their admissions in 1968-69 to this level in the light of the present unemployment among engineers (even if an optimistic rate of growth of the economy is assumed, the present studies show that the supply from existing institutions will outstrip the demand) and with a desire to limit admissions to the extent of facilities available. More careful studies in the light of targets of industrial production, the rates of growth etc., that might be assumed for the Fifth Plan targets for technical education will be laid down and the figures revised, if necessary.

5. The new departures in approach and strategy - apart from the three basic considerations mentioned in para 2 - that have been assumed for the above tasks and expenditure are:-

(i) An average teacher-pupil ratio of 1 : 45**, as against the present 1 : 40, for primary classes - mostly through the adoption of the shift system in Classes I & II. The average pupil-teacher ratio today in some States is as high as 55 and the adoption of the shift system should enable such states to bring the class size down to a manageable size within the limits of existing resources. The amount of Rs. 130 crores saved thereby is proposed to be ploughed back to improve the quality of primary education which is most urgently needed, especially to reduce the present heavy wastage and stagnation in primary classes. Many of the steps needed for the purpose do not

---

** This means an average attendance of 40 pupil per teacher.

require finance but purely organisational changes like limiting the admission in class I to the first one or two months of the year, discontinuation of examinations in early classes, adjusting the vacation to the need for labour at the time of the harvest and the sowing seasons, etc. Other measures which would have financial implications are:-

a) paying an allowance to teachers who would work in the second shift or teach in part-time classes;

b) linking the school with the community and paying remuneration to teachers who would do adult education work;

c) providing free books to students;

d) providing tools for kitchen gardening;

e) providing guide books for teachers and interesting reading material and text-books for students; and

f) providing the minimum necessary teaching aids and other equipment required in primary classes.

(ii) Development of part-time education at the middle and college stages;

(iii) Correspondence courses for secondary and higher education and for teacher training;

(iv) Streamlining and modernising the administration;

(v) Emphasis on functional literacy though on a limited scale;

(vi) Emphasis on languages and book production;

(vii) Emphasis on consolidation in technical education; and

(viii) All scholarships at the university stage to be generally loan scholarships.

6. If no additional resources are available and the above programme alone is implemented then the implications would be:

(1) The further postponement of the Constitutional Directive in the field of elementary education. The Education Commission had recommended that effective primary education of 5 years should be provided to everyone by 1975-76 and of 7 or 8 years by 1985-86. The target dates of the Steering Committee were 1980-81 and 1990-91 respectively. With the resources indicated for elementary education under the 'inevitable' expenditure, the dates by which these goals could be achieved would get postponed to 1983-84 and 1993-94 respectively.

(2) Secondary education will continue to produce students who will only rush to the universities in the absence of effective alternatives.

(3) University education will continue to be at its present low quality and turn out people largely unemployable.

(4) The vast adult population will not be effectively brought into the developmental process.

Manoeuverability and alternatives

7. If additional funds are provided the area of manoeuverability will be the amount provided minus Rs. 1080 crores and a number of choices will present themselves. Some of these will run through all sectors while others will pertain only to particular sectors. These are:-

(1) In regard to overall decisions it might be possible to take a view that we must link education effectively with productivity. So we could concentrate all the resources on these programmes which would increase productivity. These are:-

- At the school stage (up to the matriculation), providing work experience in agriculture and industry and creating through appropriate teaching methods those attitudes which are required for self-employment - initiative, resourcefulness, spirit of enquiry, leadership, etc.

- Provision of vocational education of an intensive character, especially oriented to self-employment, on a large scale, keeping in view the actual demand in the organised sector and the possibility of creating self-employment, at the end of the elementary and secondary stages.

- Provision of technical education on a large scale largely oriented to self-employment.

- Emphasis on research and design.

- Organisation of extension education including functional literacy, on a large scale so that the practising farmer is brought under the impact of education. Part-time education and training ought to be provided for upgrading the labour force within industry. This is a most promising but hitherto neglected area.

The expenditure on each programme may be determined in the light of the resources available. Another limiting factor would be the feasibility of gearing up the educational system for various programmes in the light of the limitations of personnel and the possibility of changing the present structure. Educational changes are very difficult to effect and, unless prepared carefully through a stage of pilot projects, result in considerable wastage.

(2) Elementary education may be expanded to the utmost possible extent. The limits here again are those of feasibility apart from financial resources. It is felt that it may be difficult to push forward this programme beyond what is visualised under the inevitable programme, except to bring in an additional 30 lakhs of children at the primary stage and another 10 lakhs (through part-time courses) at the middle stage. The funds required for this purpose are Rs. 50 crores. Considerable research and experimentation must be undertaken to evolve an effective programme to eliminate wastage and stagnation which is as high as about 60 per cent at the present time.

A view could be taken that as the entire nation shares the benefits accuring from elementary education and also as this stage could enable us to sift and identify talent, it should get the highest priority and whatever resources are required for turning it into an effective programme ought to be provided. Such a course will not only be socially just but also ensure effective participation of the people as a whole in national programmes of social and economic development and lay a sound foundation for the growth of our basic institutions like the cooperatives and the Panchayats etc. In view of the fact that most of our people will not go beyond this stage of formal education and, therefore, whatever new in the matter of practices and attitudes we have to introduce, we should do so at this stage, the importance of concentrating our resources on this stage of education becomes obvious. Further, as we go to higher stages the benefit to the individual and to organised groups becomes more pronounced and hence it should be easier to shift the burden of education to the beneficiaries, which is not the case at the elementary stage. Again in developing countries the most important and difficult problem is to give the large mass of the people elementary skills through which they can process raw materials in the environment into usable goods. This task can best be accomplished through a suitably oriented elementary education. To put to productive use those trained at the higher stages requires capital which in developing countries is scarce.

(3) A view can be taken to concentrate all additional available resources on the improvement of the quality of university education either over the entire field or in certain selected areas of excellence. If resources are spread over the entire field it may be difficult to produce appreciable impact. Concentration of resources on 'centres of excellence' could create focii of dynamism in our entire social, political and economical life.

(4) A view can be taken that the teacher is the most important factor in education, and, therefore, all additional resources ought to be concentrated on teacher education. The quantitative aspect is well taken care of by the funds provided under 'inevitable expenditure'. The quality of teacher training, however, could be emphasised and all its requirements met within the constraint of resources available and the feasibility of the programme.

(5) The significance of functional literacy in a country, 50 per cent of whose national income comes from agriculture, is obvious. The limitations are the vast size of the problem, the limitations of personnel required for handling the programme effectively and the absence of effective techniques required to solve the problem with utmost economy. The problem of motivation is again serious. If functional literacy is to be provided to all within the age-group of 14-45 within the next 10 years the amounts required would be Rs.450 crores*.

(6) In the field of technical education one could follow other countries by increasing the output of engineers and technicians, as they bring in maximum returns if properly utilised. The demands of the organised sector, however, are seriously limited according to all indications. If we could orient our technical education towards self-employment, these personnel could become the means of building the country in addition to creating avenues of employment. The only limitation to advance in this direction is the capacity of the system to be oriented towards self-employment within the time period under reference. Considerable experiments will need to be conducted before any effective orientation of technical education on a large scale can be a reality.

Desirable 'mix' : examination of Steering Committee's Report:

8. No single alternative could perhaps be accepted to the exclusion of others and the task before the Planning Group is to suggest the proper 'mix'. The Steering Committee has suggested one such 'mix'. Comments on this 'mix' are as follows:-

(1) The requirements of elementary and secondary education will need to be revised upwards as subsequent information about the existing pupil-teacher ratio has shown that the assumption that some of the additional enrolment will go into existing schools was not warranted. The requirements of elementary and secondary education will now be Rs. 391 crores and Rs. 229 crores respectively against Rs. 330 crores and Rs. 201 crores respectively. Secondly, the figures of elementary education are on the basis of the ratio of 1 : 45 through the introduction of the shift system. On the basis of the existing ratio of 1 : 40, the expenditure will be Rs. 156 crores more for an enrolment of 180 lakhs assumed by the Steering Committee. The Planning

* The number of illiterates in the age-group 15-44 in 1978-79, i.e. ten years hence, will be 150 million. The cost involved in making an illiterate adult literate is estimated to be Rs. 30. On this basis the cost of eradication of illiteracy among 150 million illiterates would be Rs. 450 crores during the next 10 years. This means that the average cost per year would be roughly Rs. 45 crores.

Group supports the idea of the shift system in classes I & II on the ground that the children of this tender age cannot remain engaged in academic work for more than 3 hours. They are, however, strongly of the view that this should not be used as a means of further lowering the already extremely inadequate per capita expenditure on primary education. The money saved thereby should be employed to strengthen primary education as indicated in para 7(1).

(2) In [illegible], the Planning Group tentatively suggests the [illegible] outlays from Rs. 120 crores proposed by the Steering Committee to Rs. 84 crores in view of the fact that in June 1968 there were 1.5 lakh teachers who had registered themselves with the employment exchanges. The situation should be carefully reviewed by a small committee. This committee should go into the situation in each State.

(3) While the Planning Group attaches the highest importance to the [illegible] service conditions of teachers, they have not made any [illegible] in this regard, because it has been decided to keep the improvement of salaries of teachers outside the Plan. Their estimate of this additional liability to government during the Fourth Plan is roughly of the order of Rs. 300 crores.

(4) In university education, while it is difficult to provide adequate quality in all our colleges and universities, it is necessary to create certain 'centres of excellence' where we provide all the facilities up to the optimum level so that such men can be produced who can occupy key positions in the various walks of national life. The Planning Group is of the view that at least 15 per cent of the undergraduate* and post-graduate enrolment in science, which will mean 1.10 lakh students, may be provided laboratory and library facilities at the rate of Rs. 2,000 per student for post-graduates and Rs. 5,000 per student for under-graduates. This will mean an additional cost of Rs. 30 crores. A most immediate need and challenge in the field of higher education is the improvement of the quality of post-graduate work and research. To meet this challenge certain physical inputs are necessary. But what is even more imperative is the sense of urgency and commitment in the academic community and their initiative and resourcefulness.

(5) In regard to the reduction already effected in admissions in engineering institutions the Planning Group is strongly of the view that any deliberate reduction of seats on the basis of the present unemployment among engineers would not be advisable. For on thing as institutional development is an integral whole and cannot be adjusted to reduced admissions later on, reducing

---

* Excluding the PUC and the Intermediate students.

admissions subsequently leads to under-utilisation of facilities provided and higher per capita costs. Again, so far as the need of engineers in a developing country is concerned, it is unlimited. Only the country cannot employ them at the levels of wages to which they have got accustomed. If salaries could be lowered then many more engineers could be employed than are employed today. But this question of the salaries of engineers is connected with the total wage and salary structure in the country. These salaries are today much higher than the country can really afford to pay. The PlanningGroup realises the limitation of government operating a mixed economy to control salaries and wages over the entire range of the economy. Therefore, the best perhaps that government can do is to provide seats according to current demand and allow the market conditions of demand and supply to determine the salaries of engineers. Artificial limitation of admission by a government decision may not be desirable except in the case of institutions which do not have space, equipment or teachers. The government in the case of engineers, as in the case of others, however, takes no responsibility for providing employment at any fixed level of income to those who take up these courses of their own free will and over whose future deployment government has no control. The government could assist by orienting technical training towards self-employment so that the engineers through their increased competence to handle natural resources are able to find profitable openings for themselves and help open up the country in addition. An abundance of engineering graduates could also lead them to go into other than traditional channels and lead to the development of intermediate technologies. It could also lead them to go into sales, marketing, management, etc. which should have considerable impact on increasing returns from investments made in production, as has been so forcefully pointed out by Prof. Blackett.

(6) In regard to the National Service Corps, the Planning Group recommends the appointment of a small committee to suggest the activities that should be taken up under it and the phasing of the programme.

Adjusted for the changes indicated above, the allocations in the Steering Committee's report will need to be revised as follows:-

Table 3. Distribution of the outlay of Rs. 1300 crores

(Rs. crores)

	Steering Committee's allocations	Revised allocations proposed
Elementary Education	330	486
Secondary Education	201	229
University Education	255	305
Teacher Education	120	84
Social Education	40	40
Cultural Programmes	20	20
Physical Education	30	30
Languages & Book Production	50	50
Administration	22	22
NCERT	10	10
Vocationalisation	4	4
Other Programmes	5	5
Technical Education	213	213
	1300	1498

or Rs. 1500 crores approximately

9. The Planning Group realises that the allocations they have recommended for education are higher than those indicated in the Draft Outline but in view of the National Policy Statement where the nation has resolved to spend 6 per cent of its national income on Education, presumably in the next 15-20 years, this order of expenditure in the Fourth Plan becomes inescapable. This will raise the educational expenditure to 4 per cent of the national income in 1973-74.

PLANNING COMMISSION
(Education Division)

...

LIST OF THE MEMBERS OF THE PLANNING GROUP ON EDUCATION

Dr. B.D. Nag Chaudhuri - Chairman
Member, Planning Commission

2. Shri J.L. Azad,
Assistant Chief,
Planning Commission

3. Shri V.M. Bhide,
Joint Secretary,
Planning Commission

4. Shri H.K.L. Capoor*
Director,
Directorate of Manpower
&
Joint Secretary,
Ministry of Home Affairs,
New Delhi.

5. Shri G.K. Chandiramani,
Secretary,
Ministry of Education,
New Delhi.

6. Shri A.B. Chandirmani,
Joint Educational Adviser,
Ministry of Education,
New Delhi.

7. Shri L.S. Chanderkant,
Joint Educational Adviser,
Ministry of Education,
New Delhi.

8. Dr. P.K. Doraiswami,
D.G.H.S., Nirman Bhavan,
New Delhi.

9. Shri A.H. Hemrajani,
Director,
Planning Commission

10. Shri G. Jagatpathi,
Director,
Directorate of Manpower,
Joint Secretary,
Ministry of Home Affairs,
South Block, New Delhi.

11. Shri Prem Kirpal,
Former Secretary,
Ministry of Education,
New Delhi.

12. Prof. D.S. Kothari,
Chairman,
University Grants Commission,
New Delhi.

13. Dr. Harbans Lal,
Economic Adviser,
Planning Commission

14. Shri S.K. Mallick,
Director General of
Employment & Training,
Sharam Shakti Bhavan,
New Delhi.

15. Shri J.P. Naik,
Adviser (Education),
Ministry of Education,
New Delhi.

16. Shri D.P. Nayar,
Senior Specialist,
Planning Commission

17. Dr. B.P. Pal,
Director General, ICAR,
Krishi Bhavan, New Delhi.

18. Shri G.P. Pandey,
Joint Secretary,
Ministry of Education,
New Delhi.

19. Dr. P.J. Philip,
Secretary,
University Grants Commission,
Bahadur Shah Zafar Marg, New Delhi.

20. Shri K.B. Rao,
Adviser, Planning Commission

21. Dr. A.M.D.' Rozario,
Joint Educational Adviser,
Ministry of Education,
New Delhi.

22. Dr. S.N. Saraf,
Director,
Planning Commission

23. Shri B.S. Seth,
Joint Secretary,
Planning Commission

24. Dr. P.D. Shukla,
Joint Educational Adviser,
Ministry of Education,
New Delhi.

25. Shri K.A.P. Stevenson,
Joint Secretary,
Planning Comission.

* Vice Shri Jagatpathi who was transferred.