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# Civil Works under DPEP



## An Overview

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**DPEP**



जिला प्राथमिक शिक्षा कार्यक्रम  
DISTRICT PRIMARY EDUCATION PROGRAMME

FOR REFERENCE ONLY

# Civil Works under DPEP

An Overview

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जिला प्राथमिक शिक्षा कार्यक्रम  
DISTRICT PRIMARY EDUCATION PROGRAMME

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# Contents

<b>Introduction</b>	<b>1</b>
<b>Implementation of Civil Works</b>	<b>8</b>
<b>Programme Highlights</b>	<b>19</b>
<b>Present Focus Areas</b>	<b>28</b>
<b>Conclusion</b>	<b>34</b>
<b>Abbreviations</b>	<b>36</b>



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## Foreword

The provision of necessary infrastructure is a basic requirement for universalising access to schools. Under the District Primary Education Programme, New School Buildings, Additional Classrooms, classrooms for Building-less Schools, Toilets, Drinking Water, Repairs, Cluster and Block Resource Centres as well as the augmentation of SCERTs/SIEMTs have been undertaken.

More than its sheer size, the significance of the programme lies in its contribution to pedagogy and the involvement of the community and the innovations it has promoted. Three-fourths of all works have been undertaken through the village community. Pedagogic considerations are central to the designs prepared in the second phase. An attempt is also being made to incorporate appropriate low cost technologies in construction. A continuing discussion on these and other interventions is integral to the programme.

Much experience has been gained in civil works over the last four years. This volume attempts to compile the experiences gained in the various states and districts of the programme.

This document would not have been possible without the efforts of the Civil Works Unit of the Technical Support Group for DPEP, Ed.CIL. The support we received in preparing this document from others in the TSG and DPEP Bureau is gratefully acknowledged.

(R.S. Pandey)

# Introduction

District Primary Education Programme stems from the National Policy for Education (NPE) 1986 and the Programme for Action (POA) 1992. The significance of the programme lies in its comprehensive and holistic vision in tackling the challenge of universalising elementary education'. The programme guidelines clearly recognise the need for various interventions to be taken up simultaneously (see box). Universalising primary education in a country like India is a complex problem, the solutions too will not be simple.

## Civil Works

As stated in the NPE, Universal Elementary Education (UEE) has three aspects:

- Universal access and enrolment;
- Universal retention of children up to 14 years of age; and
- A substantial improvement in the quality of education to enable all children to achieve essential levels of learning.

The civil works programme emerges directly from these objectives. All three issues: access, retention as well as quality improvement, are directly linked to the

The three aspects of UEE—access, retention and improvement in the quality of education—are directly linked to the availability and provision of physical infrastructure.

## Basics of DPEP

National experience with the pursuit of UEE had established the following:

- UEE is contextual. The contextuality varies widely across the country.
- Contextuality entails local area - planning with disaggregated targets and decentralised planning and management.
- Resources are an important but not sufficient condition for achieving UEE. A host of measures both financial and non-financial, both on the supply side and on the demand side, need to complement higher allocation of resources.
- The strategies for UEE need to be augmented by:
  - A holistic planning and management approach;
  - This holistic planning should incorporate a gender perspective in all aspects of the planning and implementation process;
  - Addressing the more difficult aspects of access, particularly access to girls, disadvantaged groups and out of school children;
- Improving school effectiveness;
- Strengthening the alternatives to schooling, particularly the non-formal education system;
- Stressing the participative processes whereby the local community facilitates participation, achievement and school effectiveness;
- Toning up teacher competence, training and motivation;
- Stressing learning competence and achievement;
- Stressing need for improved teaching/learning materials;
- Streamlining of planning and management in respect of both routine and innovative areas; and
- Convergence between elementary education and related services like ECCE and school health.



Additional Classroom (Assam)

availability and provision of physical infrastructure.

The concept of decentralisation is deeply rooted in the programme. Within the umbrella of a national vision, each state and district follows systems and procedures that it deems fit. Consequently, systems and procedures vary significantly from state to state.

Financially, up to 24% of a district plan can be allocated to civil works. Typically this works out to a maximum of about Rs. 10 crores for a district. However, the actual plan size and civil works component varies from district to district.

*It takes more skill than I can tell ....  
....to play the second fiddle well!*

Though construction is not the primary focus of DPEP, it still has a distinct role to play in furthering the objectives of the programme. Civil Works aims to go beyond just constructing many thousands of buildings. Like other components, it works towards a synergy with other areas, objectives and requirements of the programme.

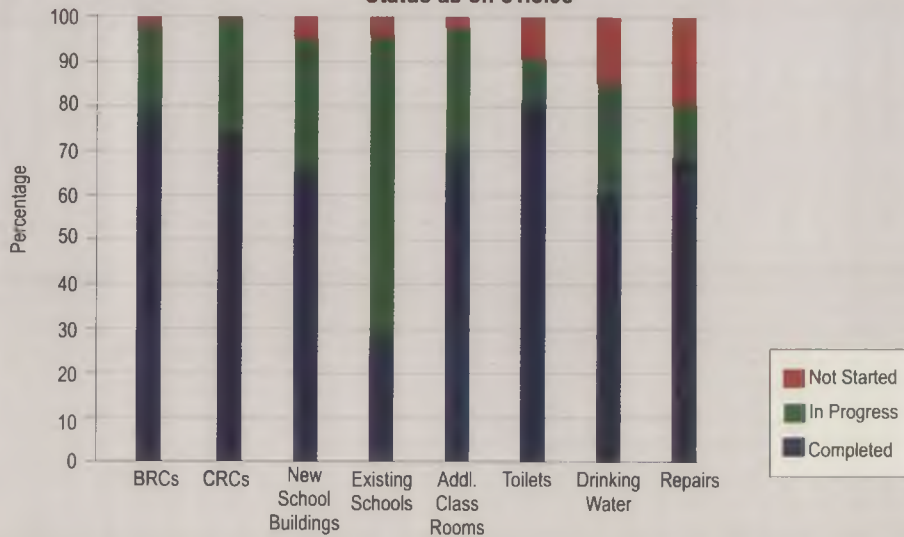
**Pedagogy:** From the second phase of the programme, each state has undertaken a design renewal exercise. A large number of designs have been prepared. The basic brief to the consultants has been to prepare designs that are sensitive to the pedagogical and village context in which the school must function. The resulting designs have been a

#### DPEP I Progress - Physical (Componentwise)

S. No.	Item	Total Target up to March 98	Completed as on 31.03.98	In progress as on 31.03.98	Not started as on 31.03.98
1	BRCs	413	325	78	10
2	CRCs	954	724	227	3
3	New School Buildings	4619	2988	1425	206
4	Existing Schools	518	151	346	21
5	Addl. Class Rooms	6740	4692	1932	116
6	Toilets	6873	5541	678	654
7	Drinking Water	3571	2156	875	540
8	Repairs	4510	3117	474	919
9	MIS Centres	16	9	1	6
10	SCERT/SIEMT	6	0	0	6
11	Hostels	3	2	1	0
12	Boundary wall	647	512	77	58
13	Residential schools	30	8	16	6
14	ECE Centres	121	79	26	16
15	Multigrade centres	30	9	15	6
16	Separation walls	575	478	23	74
17	Electrification	515	5	2	508
18	URCs	3	0	1	2
	<b>Total</b>	<b>30144</b>	<b>20796</b>	<b>6197</b>	<b>3151</b>

## Component wise Targets and Achievements under DPEP-I

Status as on 31.3.98



quantum jump from the traditional designs of rural primary schools.

**Community Involvement:** Construction through the community is a cherished ideal of the programme. Three fourths of all construction in DPEP is done through the community. The community directly employs labour, buys materials and oversees the construction. The role of the engineering staff is focussed on providing technical support and supervision. The aim is to vitalise the Village Education Committee (VEC) at an early stage through the direct involvement with the construction of the building. The aim is to involve the VEC in the all round development of primary education in the village.

**Sustainability:** DPEP aims at ensuring the long term sustainability of its interventions. The preparation of school designs in terms of pedagogical requirements and the village context emerge, in part, from this concern. Community Ownership is recognised to be one of the best means of ensuring the long term sustainability of the interventions. Construction through the VECs has been able to generate a sense of ownership to a large extent.

## Toilets and drinking water

The provision of basic school facilities like drinking water, toilets and electrification (in some states) is an important part of the civil works programme. Attempts have been made to improve the design and construction of toilets in particular, to address maintenance concerns that often arise. In Bihar (left) 'G' shaped urinals have been constructed. The shape allows a reduction of cost due to the elimination of the door, as well as a reduction of bricks in the wall. Waste water from the hand-pump is channelised through the urinal. Ferro cement toilets (right) have also been constructed. Pre-fabricated panels have proved to be a better option than the use of cast in-situ systems due to the high degree of technical supervision required.





### Planned Civil Works targets under DPEP

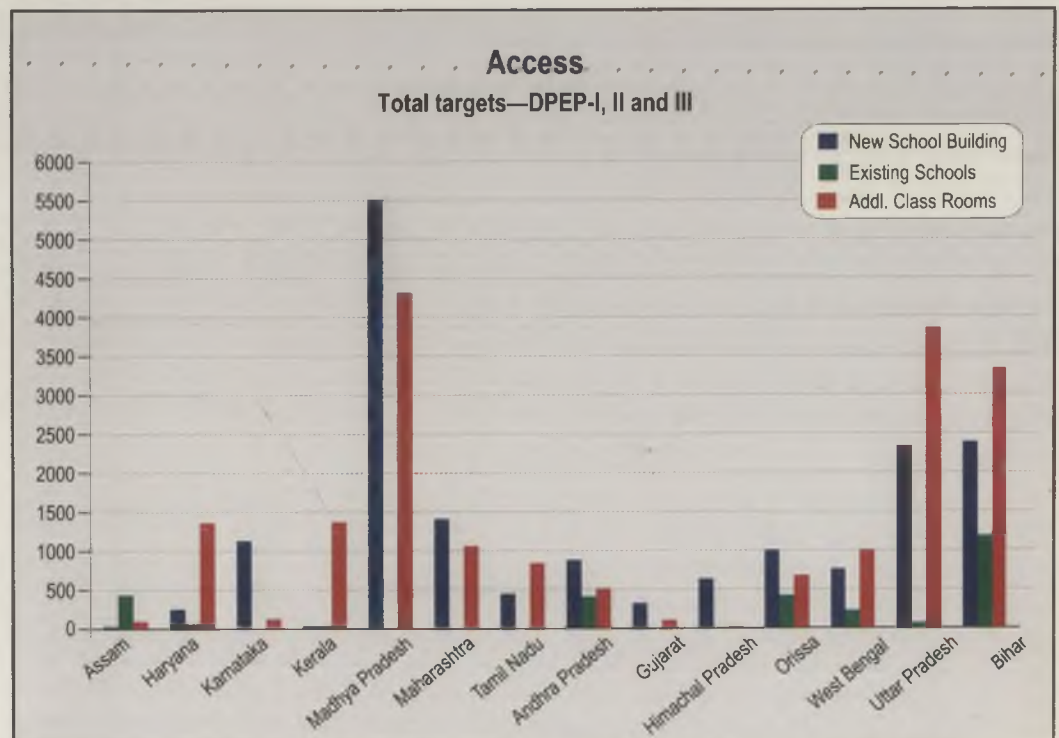
	Assam		Haryana		Karnataka		Kerala		M.P		Maharastra		Tamil Nadu	
	DPEP I	Expn.	DPEP I	Expn.	DPEP I	Expn.	DPEP I	Expn.	DPEP I	Expn.	DPEP I	Expn.	DPEP I	Expn.
No. of districts	4	5	4	3	4	7	3	3	19	15	5	4	3	3
BRC	17	29	28	25	40	66	25	30	198	171	34	39	71	34
CRC	287	325	266	277	234	821	167							
New schools	30	35	145	99	461	622	37	22	2700	2798	441	910		429
Building-less schools	447	510	42	20		0	29	11		0		0		0
Additional classroom	96	713	787	518	16	109	727	588	2311	1915	1017	0	805	0
Toilets	447	1235	1970	1750	812	622	51	215		0	2500	1350	1059	792
Drinking water	0	1469	746	895	812	622	69	290		2969	850	2900	1059	792
Repairs	89	1440	412	1400	220	0	1	375	1886	0	1220	380	408	454

Planned target for DPEP I districts as per latest progress reports.

Sustainability is also seen in terms of the cost, materials and techniques of construction adopted in the buildings. The programme is undertaking the resource mapping of local systems of construction in the states. This leads to the construction of prototype buildings and the consequent adoption of alternate technologies in the regular works. This would also lead to significant cost savings. Bihar has taken a lead in this due to the experience gained through the Bihar Education Project and is

undertaking all works using alternate technologies.

**Innovation and Flexibility:** There is ample scope for innovation and flexibility within the project. A separate fund of Rs. 50 lakhs has been earmarked in each state specifically for this purpose. The programme has witnessed the development of computerised survey and implementation system for repair works in Gujarat. Each state has utilised this flexibility to adopt



### Planned Civil Works targets under DPEP-II & III

	Orissa	Gujarat	Himachal	A.P	W.B	U.P	Bihar	Total
No. of districts	8	3	4	19	5	15	17	153
BRC	87	23	23	255	117	215	200	1727
CRC	1068		235	0	818	2109	1798	8405
New schools	960	310	608	841	728	2360	2288	16824
Building-less schools	407	0	0	396	221	28	1138	3249
Additional classroom	645	100	11	490	955	3729	3187	18719
Toilets	2892	1500	462	2050	675	5985	9601	35968
Drinking water	270	710	520	736	450	4581	6892	27632
Repairs	1291	1315	570	0	1660	18826	316	32263

systems and practices that are best suited to its conditions.

### Project Components

#### Universalising Access

#### New school buildings, building-less schools

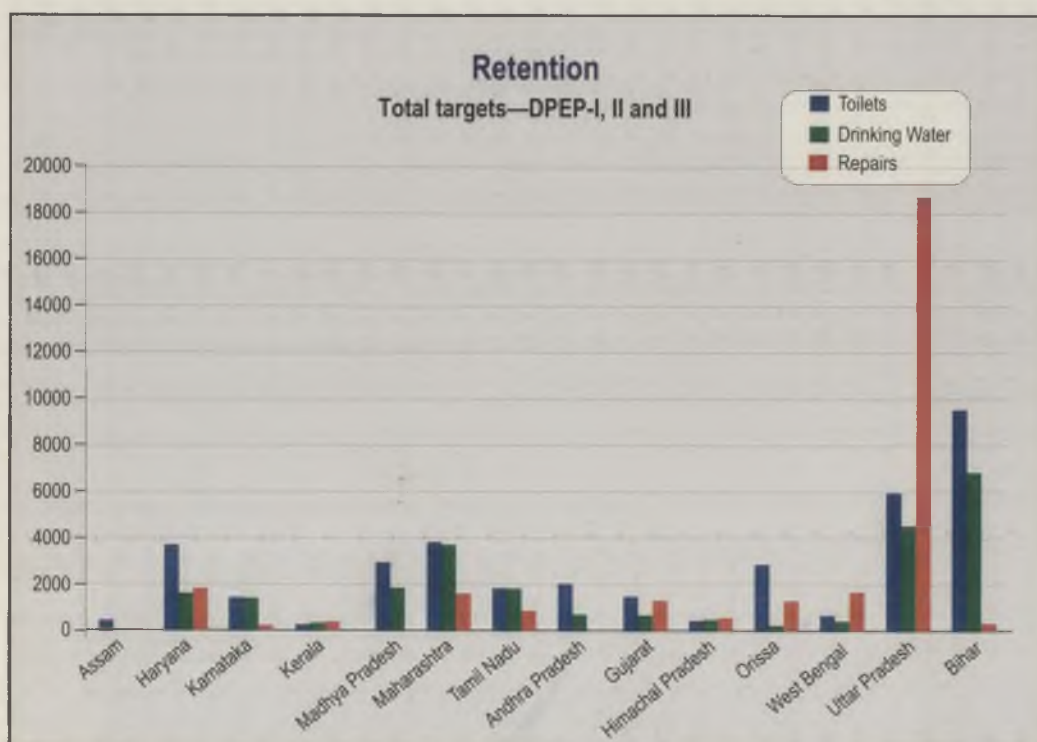
Towards universalising access, DPEP is providing a total of 16,824 new school buildings in 149 districts of the programme. Habitations qualify on the basis of state norms of population and distance from the school. Smaller habitations are to be covered through the alternate schooling programme.

A total of 3249 building-less schools have also been provided with buildings.

#### Retention

#### Additional classrooms, repairs, toilets, drinking water, electrification

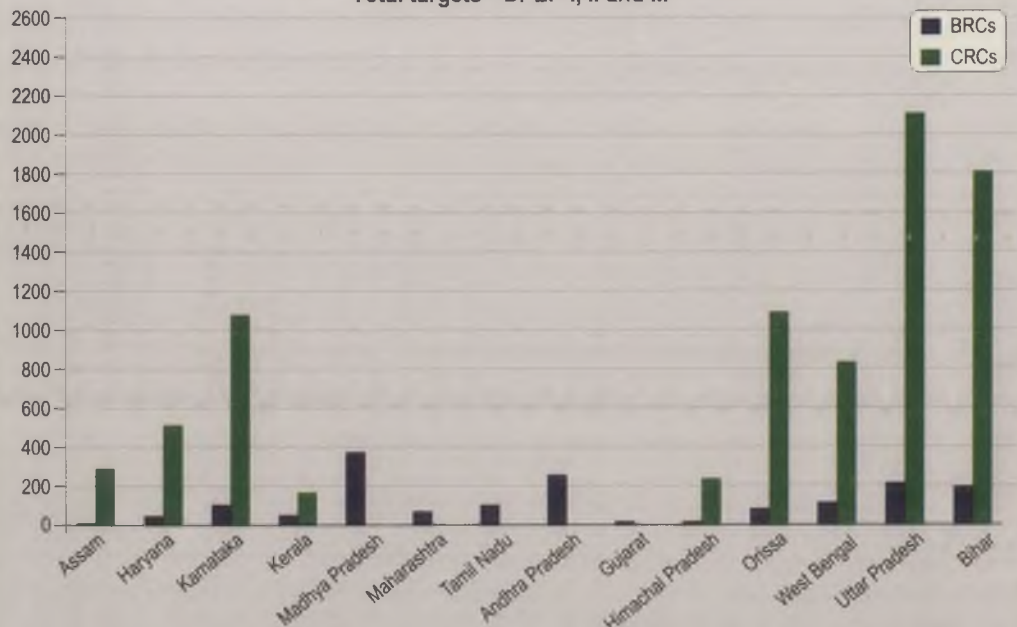
Retention of the large number of children in and joining school requires the provision of additional classroom space. Towards this end, the civil works programme includes the provision of one, two or three additional classrooms as per the school need. Repairs of school buildings are also undertaken in most states to supplement the amount of usable space at a lower investment.



Towards universalising access, DPEP is providing a total of 16,824 new school buildings in 149 districts of the programme.

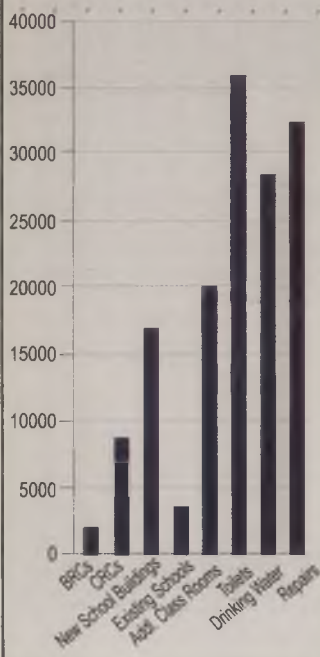
## Capacity Building-Improving Quality of Education

Total targets—DPEP-I, II and III



Note: Andhra Pradesh provides Mandal Resource Centres in place of BRCs and CRCs. In Maharashtra, Madhya Pradesh, Tamil Nadu CRCs are budgeted under the heads of additional classrooms.

### Overall targets proposed under DPEP



The provision of toilets are critical in retaining the girl child in the higher classes. Other campus facilities also aid in the retention of students and improving the basic standards of the school. This includes the provision of drinking water facilities & (in some states) the electrification of schools.

A total of 18719 additional classrooms, 32263 repairs, 27632 drinking water facilities and 35,968 toilets have so far been constructed / planned under DPEP.

### Improving the Quality of Education CRCs, BRCs, SCERTs / SIEMTs

Amongst the various strategies towards improving the quality of education, is the provision of a support system for the schools.

The Cluster Resource Centre (CRC) is typically a 'meeting room' with small room for the CRC co-ordinator and storage. CRCs are provided for every cluster (of about 10 to 12 villages). It is the meeting place for all the teachers of the cluster.

Monthly meetings are held wherein teachers discuss with the co-ordinator to assess, prepare teaching systems, etc. In most states the CRC is provided as an additional classroom to a school in the cluster.

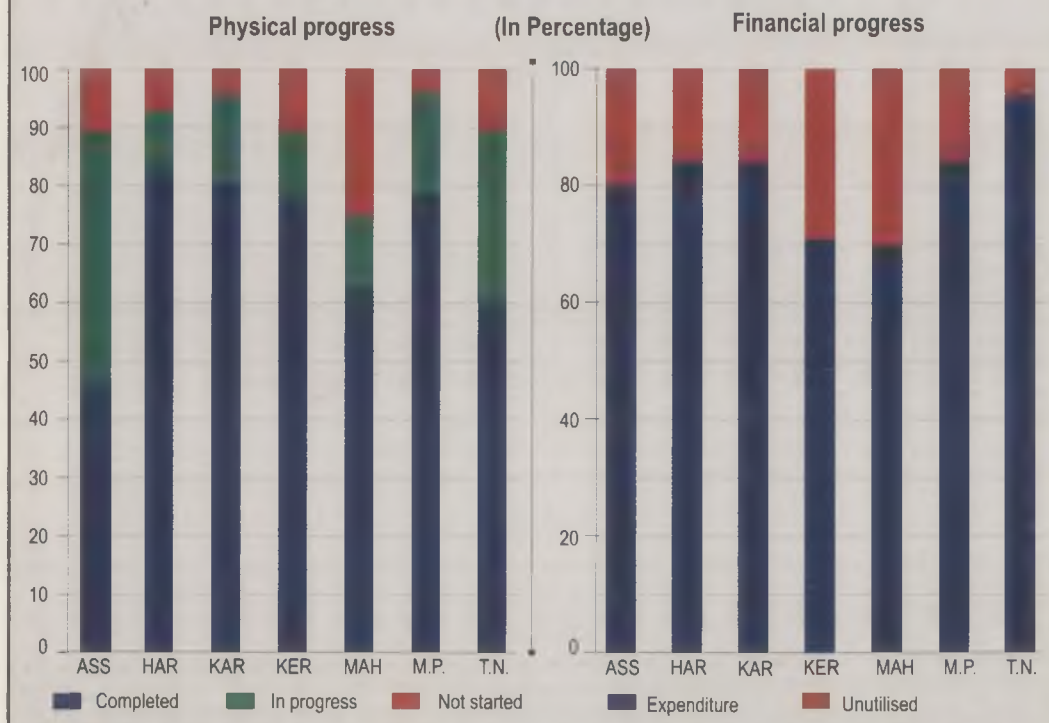
A Block Resource Centre (BRC) is provided in every block of the district. The BRC has provisions for conducting training programmes. In many states BRCs are residential and include dormitory facilities for the teachers under DPEP.

In some states, DPEP also provides for the augmentation of the civil infrastructure of State Council of Educational Research and Training (SCERT) and State Institute of Educational Management (SIEMT) in some states. In certain states where the entire building is being constructed, the cost is usually shared with the state government.

### Status of Civil Works

Initially, construction activities were slow to take off on account of procedural delays in obtaining administrative and technical sanctions and other related start up

## Progress of Civil Works in DPEP-I States



difficulties. Many of these start-up problems were acted upon and processes sought to be streamlined. The progress of construction, has consequently, accelerated tremendously since 1996-97.

At present, various districts are in different stages of implementing civil works. In

DPEP I districts implementation of civil works is nearing completion. In some DPEP II districts implementation of civil works has been initiated during 1996- 97. In the remaining districts civil works implementation has been initiated in the current year.

### End Notes

<sup>1</sup> For a more detailed background of DPEP, please refer to: DPEP Guidelines, Pp. 1-7. Dept. of Education, Ministry of Human Resource Development and Three years of DPEP—Assessment and Challenges, Pp. 1-8. Dept. of Education, Ministry of Human Resource Development

<sup>2</sup> Based on DPEP-I progress report figures of March 31st 1998 and the five years perspective plans of DPEP-II, III & expansion districts. (The figures include works that are complete, in progress and those that are planned.)

# Implementation of Civil Works

## Planning

To maximise benefits in such a challenging context requires detailed and continuous planning processes.

- A five year perspective plan is prepared for all districts, annual plans are prepared each year based on the performance in the previous year.
- The ideal of local participation is well established in the planning process. The process of identifying requirements, identifying sites, etc., is undertaken through village, cluster and block level representatives.
- There has been a continuous development of the ability to prepare Annual Work Plan & Budgets. The quality of plans still vary across states and in many cases plan documents do not follow prescribed formats. But, the understanding of the requirements of a civil works programme has improved (in the DPEP-I states).

However, the planning for civil works is not always objective/criteria based. The plans need to have clear strategies towards attaining DPEP objectives.

- An understanding of the total infrastructure requirement and likely gaps needs to be the fundamental focus of the plan document. This understanding needs to be strengthened in the plans. The prioritisation of civil works has to happen with this background.
- The aspect of convergence is increasingly becoming a part of the planning in the districts and the states. However, DPEP needs to emerge as a means of channelising all complementary developmental funds in a focussed manner towards the achievement of the stated objectives.
- The understanding of implementation issues needs to be stronger in the plans. The planning of BRC works is a case in-point. The construction of BRCs is almost always planned in the first year. In many instances this is not actually achieved as the construction of BRCs involves various preparatory activities which are not always widely realised. This includes activities from the preparation of designs to (in many cases) the approval of bid documents before the actual tendering of works can begin. A comprehensive understanding would allow better preparation of works. The plans need to have a greater emphasis of non-financial activities that are significant in the actual implementation of work.
- Outside the engineering community the awareness of preparatory activities for



civil works is still lower. Civil works plans are essentially focussed on financial accounting. There is a need for a stronger interface between the planning units and engineering staff at all levels to generate a better understanding of implementation requirements of a civil works plan.

- Eventually, an effective plan should be automatically linked to the monitoring of works. This connection becomes obvious once the plan contains a realistic assessment of the likely progress of work. DPEP Gujarat, will be developing such a computerised project management system (in continuation to its repairs system) in the current year. The results would be worth examining.

## Implementation and Delivery Systems

### Systems of Construction

As per the norms prescribed, civil works can be undertaken through any of four procurement procedures. These are :

- **National Competitive Bidding (NCB)** - All DPEP works can be undertaken by contractors selected through a bidding process. Works above Rs. 7 lakhs in all states have to be undertaken through the bidding process. In Bihar works above Rs. 10.5 lakhs are undertaken through the NCB process.
- **National Shopping Procedure (NSP)** - Individual works upto Rs. 7 lakhs can be undertaken by contractors through NSP as well. It is essentially similar to NCB but hastens the process by allowing bids to be invited from a minimum of three registered contractors.
- **Community Participation** - Individual works upto Rs. 7 lakhs may also be undertaken through the community. Two persons from the Village Education Committee are the financial co-signatories.
- **Force Account** - Individual works upto Rs. 7 lakhs can also be implemented through a government department, like the Public Works Department (PWD),



Zilla Panchayat Engineering Department (ZPED), etc.

### Systems of Supervision & Monitoring

Supervision of civil works is undertaken by field engineers at the site level, while monitoring is undertaken at the district level.

#### Supervision

Different systems of supervision have been adopted by the states. This includes:

- **In-House Engineers:** Some states have engineers employed, contracted or on deputation to DPEP. The actual staffing pattern, mode of employment, payments, etc., varies from state to state. (See table for details)
- **Government Department Engineers:** In some states, Government departments like the Rural Engineering Services, Zilla Panchayat Engineering Department, etc. provide supervision for the sites of work.
- **External Agency:** In Kerala, an external agency, the Small Industries Development Corporation Ltd., has been hired to provide supervision.

#### Monitoring

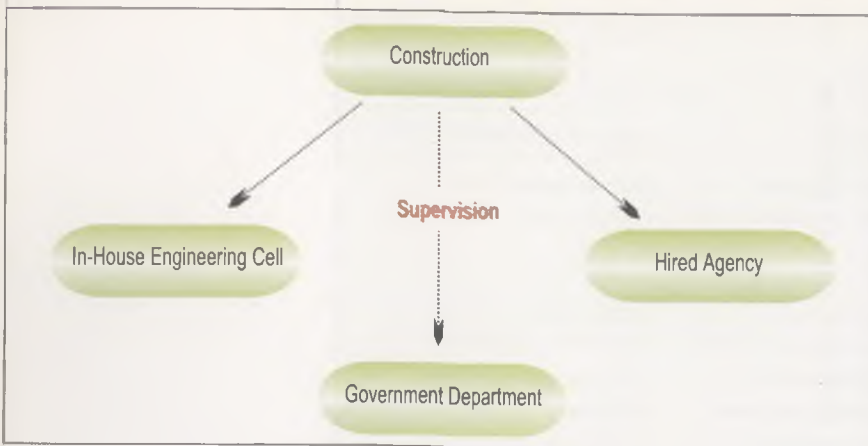
The role of the monitoring cell is to ensure regular progress of works and identify bottlenecks in the process of implementation. The cell provides regular

## Supervision Strategy for In-House Engineers

S.No.	Details	Assam	Haryana	AP
1.	District engg cell	Dist. Project Engineer (DPE) One JE per block	1 sub divisional engineer four JEs one TRP per block	2 Deputy Ex. Engrs 6- Asst. Ex. Engr/ AE 12-Work supervisors (5-6 works per supervisor)
2.	Mode of appointment	DPE-on deputation JE-Deputation/ contract	SDE-on deputation JE & TRP-on contract	DEE & AEE/AE-on deputation Work supervisors on contract through agencies.
3.	Type of agreement with contract staff	Contractual appointment letter	Contractual appointment letter for a period of one year	Contract agreement with the agencies.*
4.	Qualifications for contract staff	JE-Degree/diploma holder with experience in the building construction	JE-Degree/diploma holder with experience in the building construction TRP-minimum diploma	Minimum diploma holder with adequate (2-3 years) in the building construction.
5.	Remuneration supervision charges	JE-Ranging from Rs. 4000/- to Rs. 4500/- p.m. (fixed)	JE-Rs. 4500/- p.m. (fixed) TRP-Rs. 150 per day for 20 working days in a month.	maximum 2% of the estimated cost of building or Rs. 3000/- which ever is less as mentioned in the tender notice.
6.	Mobility	DPE-Jeep at DPO JEs-One two wheeler per 2 JEs 3 Two wheelers are available at DPO for civil works. Rs. 750/- will be paid towards TA upon submission of bills	SDE-Two wheeler JE-As per state Govt. norms TRP-Actual Bus fares	DPO is empowered to hire of vehicles. Separate jeep was provided for Dist. Engg. personnel Charges for the hired vehicle are Rs. 9000/- per month up to 2500 Kms and extra Kms will be paid at the rate of Rs. 3.75 per KM.
7.	Frequency of visits	JE-Minimum once a week every site	JE-minimum twice a week every site TRP minimum twice a week every site	DEE-6 times each site AEE/AE - 12 times a site supervisor-12 times each site and all important stages of the work & as VEC required.
8.	Number of sites	DPE All the works in the Dist. JE-All the works in the block	JE-All big works (NCB) in the Dist. (BRC's, New school etc.) TRP-All the community works in the block	DEE-All the works in the Dist. AEE/AE - All the works in the respective mandals supervisor-5-6 sites per each supervisor.

Bihar	Gujarat	Orissa	Himachal Pradesh
<p>Consultant for 2-3 Dist 2-Asst. Engrs. 4-JEs 20- Supervisors All the staff on contract</p>	<p>Asst. Engineer 1-JE 1 TRP per block  AE-on deputation</p>	<p>Asst. Engineer 1-JE per block  All the staff on contract</p>	<p>Asst. Engineer 1-JE per block  All the staff on contract</p>
<p>Contractual appointment letters for a period of a year Preferably diploma holders, ITI, master masons with adequate experience in the building construction. Consultant -Rs. 6000/- p.m. plus 1% of the estimated cost for each new design. AE-Rs. 7000/- p.m. JE - Rs. 5000/- p.m. supervisor 2.5% of</p>	<p>Contractual appointment letter for one year JE-Degree/diploma holder with adequate (1/3 years) experience in building construc- tion TRP - diploma holder JE -Rs. 5000/- p.m. TRP-Rs. 5000/- p.m. for degree holder &amp; Rs.4000/- p.m. for diploma holder.</p>	<p>Contractual appointment letter for six months JE-Degree/diploma holder with adequate (2-3 years) experience in building construction AE-ranging from Rs. 3000/- to . Rs. 3500/- p.m to Rs. 2500/- p.m.</p>	<p>Contract agreement for one year  AE-Degree holder with good years experience. JE- Degree/diploma holder with experience in building construction. TRP - diploma holder AE-Rs. 2200+ 136% DA p.m. JE-Rs. 1800+ 136% DA JE- ranging from Rs.2000/-p.m.</p>
<p>One jeep for AE and two motor bikes for JE have been proposed per each district. Petrol allowance will also be provided. As supervisors are local, no traveling allowance has been proposed. Consultant-2 times a site AE-4 times a site JE-8 times a site supervisor -minimum twice a week each site and all other important stages of the work. AE-All the sites in the dist. JE-works in the respective blocks Supervisors 5-6 sites per each supervisor</p>	<p>AE &amp; JE -TA will be paid as per State Govt. norms TRP- Actual bus fares. Also allowed to use their own vehicle for which TA will be paid as per State norms.</p> <p>AE &amp; JE - All the sites in the district. TRP-All the works in the respective block</p>	<p>AE-DPO has empowered to hire the jeep for civil works. JE -TA as per State Govt. norms. He is allowed to use also his own vehicle</p> <p>AE - all the sites in the district. JE-All the works in the respective block</p>	<p>the estimated cost or Rs. 4000/- per building which ever is less. DPO/AE is authorised to hire the vehicle 15 days in a month. JE-Actual bus fares. bus fares. Also allowed to use their own vehicles for which TA will be paid as per State norms.</p> <p>AE - All the sites in the district. JE-All the works in the respective block</p>





reports of the progress of works to the State Project Office (SPO).

Monitoring has generally been undertaken by the same agency involved with the supervision. However, there are some exceptions to this. In Maharashtra for instance, monitoring has been undertaken by an in-house engineering cell while supervision is done by the Zilla Panchayat Engineering Department.

### DPEP- I Civil Works Implementation—The experience

Each state has adopted a different system of civil works implementation through a combination of construction, supervision and monitoring systems. Almost three-fourths of the works have been undertaken through the community.

#### Community Participation

Community participation has been pursued through different supervision and monitoring systems as shown above.

#### Supervision through a hired agency

Community Works undertaken by the Parent-Teacher Association (PTA) in Kerala are supervised by the Small Industries Development Corporation Ltd. (SIDCO), an agency hired for this purpose. District level monitoring was also undertaken by SIDCO in DPEP-I. Civil Works was co-ordinated by a Programme Officer at the State level.

The Third Party Evaluation Report for Kerala

points out the inadequacies of this system. The absence of engineering staff at the district and state levels has greatly reduced the control of the state office on the works. This has led to avoidable concerns of improper site selection and quality concerns in some cases.

The experience of hiring an agency has not been entirely satisfactory. It needs to be supported by adequate technical staff to monitor the work.

To address these weaknesses, for DPEP-II, a civil works specialist has been appointed on contract at the state level. One engineer has also been contracted in each of the districts for the monitoring of works.

However, the state office in Kerala has been constrained as far as the appointment of agencies/engineers are concerned. Primary school buildings in Kerala are maintained by the state PWD. The PWD in turn, accepts the responsibility of only those buildings which it constructs itself and certifies or buildings which are certified by SIDCO. Consequently, the SPO has limited options of construction agencies.

#### Supervision through a government department

Government departments have been supervising community participation works in Madhya Pradesh (Rural Engineering Services) and Maharashtra (Zilla Panchayat Engineering Department).

In Maharashtra, one Executive Engineer and two Junior Engineers are present at the district level for the monitoring of works. Madhya Pradesh had allocated two Assistant Engineers and four Junior Engineers in each district. However, due to delays in the deputation process, the vacancies were not filled in many districts.

Supervision through departmental engineers has raised certain concerns in DPEP I. The following reasons can be ascribed:

Each state has adopted a different system of civil works implementation and almost three-fourths of the works have been undertaken through the community.

- Departmental engineers need to handle DPEP works in addition to their already existing works. The engineers are often already overloaded with their regular work. Consequently, it becomes difficult for the engineers to provide the amount of supervision expected by DPEP.
- The systems of work are very different from the conventional systems that the engineers are used to. Procedures are based on an inherent faith in the community. Accounting systems and fund releases in VEC works aims to foster a sense of ownership of the works. For instance, funds are released in advance in 'good faith'. This almost never happens in any traditional system of work. Further, engineers are not expected to follow a rigorous system of checking and measuring as would happen with contractors. Departmental engineers, when they are to provide supervision, have difficulty in adopting unconventional ways of working in DPEP sites. Consequently, the actual

involvement of the community is reduced.

There has been some recognition of the weaknesses of this system. In phase-II, Maharashtra is creating an in-house engineering cell for the supervision of works as well. Amongst DPEP-II states, Uttar Pradesh is following a similar system.

### Supervision through an in-house engineering cell

In DPEP-I Assam and Haryana created In-House Engineering Cells for the supervision of civil works. Of all the supervision systems, this has clearly emerged as the most successful. It is significant that almost all new states have adopted this pattern. Andhra Pradesh, Himachal Pradesh, Gujarat, Orissa, and Bihar have already appointed In-House Engineering Cells. West Bengal is in the process of appointing engineers for the same.

However, the actual pattern of staffing and the mode of appointment varies from state to state. Details of the staffing systems are

The systems of work are very different from the conventional systems that the engineers are used to. Procedures are based on an inherent faith in the community.

## Mode of Appointment

Different modes of appointment have been used for obtaining engineers in DPEP:

**Deputation:** Appointment on deputation from government departments has been the preferred mode in many states. This has worked effectively in many cases. However, there has often been a delay in obtaining engineers on deputation at supervisory levels. This has been the case in a state like Madhya Pradesh where a few vacancies in the districts have been filled but many still remain.

**Contract:** Procedurally, contract appointments have in many cases been more speedy. A combination of engineers on deputation and contract has worked effectively in Haryana and Gujarat. It has provided the flexibility to increase staff when the work load has increased. Haryana has also used technical supervisors (mortar-mates) on daily wages for short duration where required.

Contractual appointments aim at

minimising the liability of the state office. This has been done in different ways:

- **Appointment through an agency:** Engineers have been appointed by an external agency and the fees have been routed through the same agency.
- **Appointment for a fixed duration of time:** In some cases the engineers are given contracts for fixed periods of time which are extended as required.
- **Appointment for a fixed number of sites:** In some cases, supervisors are appointed for the completion of a fixed number of sites.

**Bidding:** Andhra Pradesh attempted to bid the supervision of a group of sites to individuals/ agencies. The procedure appeared to be an effective one but there have been instances where the amounts bid were too low to sustain the engineers through the entire construction period.

## Third Party Evaluation of Civil Works

The Civil Works Programme in the seven states DPEP-I states was evaluated by a third party between end 1996 and mid 1997. The reports present an extensive picture of the Civil Works programme. It is heartening to note that most of the works are reported to be of good or acceptable quality.

The basic findings of the reports are as follows:

- By and large, the systems adopted by DPEP have sufficient checks and balances to ensure that basic quality standards are maintained.
- Community Participation works are of good quality in states with strong supervision systems.
- NCB works were reported to be of acceptable quality. However, the number of NCB works evaluated was comparatively much lower than VEC and Force Account works. The quality of works in Tamil Nadu were reported to be good but the costs are also amongst the highest of all states.
- Quality concerns were greater in cases where departmental engineers provided supervision.
- Serious concerns exist in a few sites in Kerala where a hired agency was providing supervision. Serious concerns were also expressed in a few sites in Madhya Pradesh.

Areas of concern clearly exist. The need for providing adequate supervision is one prominent case. This results in problems of

quality that can easily be avoided by regular technical supervision. The issue of the maintenance of site records is another. Most issues pertain to deficiencies that are systemic but can be rectified.

What is significant is that the types of concerns in the quality of work and their causes, are to a large extent similar across states. They reiterate certain basic requirements:

- Supervision needs to be provided through dedicated staff wherever this is not happening at present
- Traditional construction systems using cement concrete are prone to various problems. Close technical supervision is required at every stage of construction in order to ensure proper quality. A concerted attempt has to be made to rationalise construction materials and technologies. All works in DPEP Bihar are being undertaken through low cost alternate technologies.
- There is a clear case for the use of appropriate local materials to ensure lower costs and better quality of materials. Standard (centralised) specifications can result in situations where poor quality bricks are being used in a place where good quality stone is available. While such rationalisation is happening in some places, it needs to be undertaken in a systematic manner in other areas as well.



indicated. Details of the staffing system is given on pages 10-11.

**Staffing pattern:** The staffing patterns adopted by the states with an In-House Engineering Cell is shown in the adjoining table.

In the first case, a site engineer is likely to be handling about 25 sites simultaneously. (This includes small works like hand pumps & toilets as well as large works like additional classrooms and schools).

In the second case, the supervisor handles about 5 larger sites as well as a few small works.

### Comparison between supervision systems

A comparison between the different systems is very revealing. In a state like Bihar there is a comprehensive staffing pattern providing strong support to the civil works programme. Every five sites has one supervisor in charge. About five supervisors report to one JE. For every two JEs, there is one Assistant Engineer at the district level. In addition Bihar also has one consultant (architect / engineer) who oversees the programme and provides the necessary technical support at all levels.

In comparison, in Madhya Pradesh, most districts have no DPEP engineering staff to monitor the work. While a few consultants have been appointed recently, their role is not as comprehensive as it is in Bihar. The RES engineers provide supervision and report to the concerned RES officer. DPEP has limited control on the site engineer. So much so that the Third Party Evaluation could not identify the engineer in charge of some sites of work. The District Project Office receive progress information through the BRCs.

The chart gives a clear picture of the difference between the two supervision systems being adopted for similar

In-House Engineers for Site Supervision		
S.No.	Pattern	States
1	States with about one engineer per block	Assam, Haryana, Himachal Pradesh, Orissa, Maharashtra (Expansion districts - to be appointed), West Bengal (to be appointed)
2	States which have district engineers as well as supervisors for every 4-5 sites	Andhra Pradesh, Bihar

community participation works (see pg 16).

### Contractual Works (NCB / NSP)

In Tamil Nadu, all works are taken up through contractors. In other states only a limited number of works are contracted out.

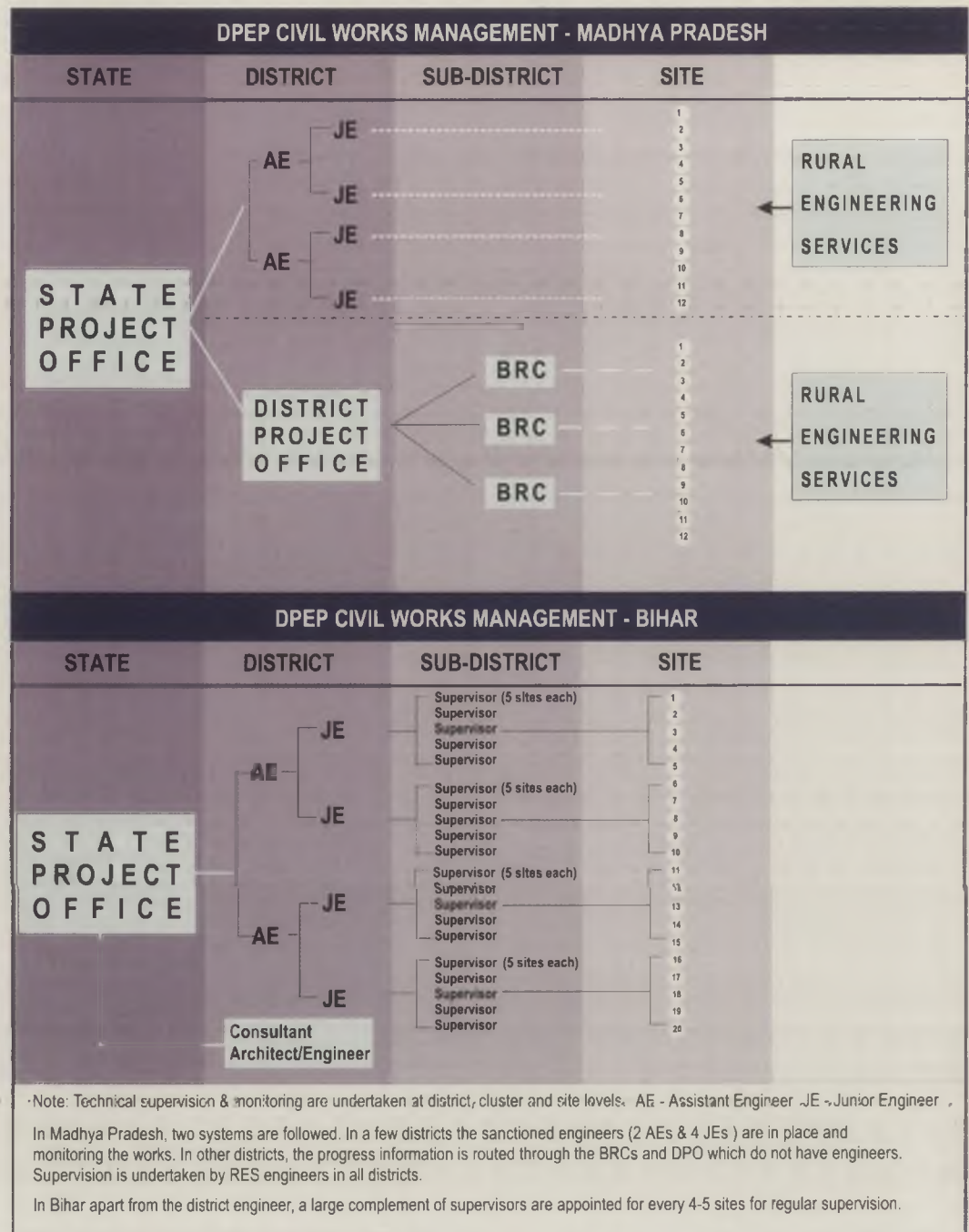
The quality of construction has been reported to be acceptable in many cases. In Tamil Nadu, where there is a strong system of works contracted by PWD, the quality of work is largely good. However, in more remote areas, the process of bidding works is sometimes delayed due to insufficient responses from contractors.

It is primarily the BRCs which exceed the prescribed financial ceiling that are undertaken through contractors.

Haryana has undertaken the construction of schools through NCB in some cases to expedite the works. However, in DPEP-II up

NCB Construction in DPEP-I		
S. State No.	Works	
1 Assam	BRCs	
2 Haryana	BRCs, A few new school buildings and three classrooms.	
3 Karnataka	BRCs	
4 Kerala	BRCs	
5 Maharashtra	BRCs	
6 Tamil Nadu	BRCs, new school buildings	

Note: In M.P. BRCs are undertaken by the community as the cost of construction is under Rs. 7 lakhs.



to three additional rooms are to be constructed through the community in DPEP-II. NCB works are likely to be limited to BRCs.

Even in Tamil Nadu, where only the contract system was being followed, a few sites of community participation were undertaken by the SPO. The results have been very encouraging and the SPO is expected to undertake more works through the community in the expansion districts.

### Departmental Works (Force Account)

Only Karnataka is undertaking all its works through Force Account using the Zilla Panchayat Engineering Department (ZPED). While the ZPED has a large engineering staff, some concerns have been raised about the quality of construction. However, the systems of monitoring and reporting are strong.

Tamil Nadu is undertaking toilets, drinking waters and repairs through Force Account

### Civil Works Implementation Systems in DPEP-I

State	Component	Procurement Procedure	Monitoring System (District / sub-district)	Supervision System (Site level)
<b>Assam</b>	Toilets, Hand Pump, Boundary Wall, Single Classrooms, Cluster Rooms, Additional Two Classrooms, New School Buildings, Additional Three Classrooms, etc. BRCs	Community Participation  National Competitive Bidding	In-House Engineering Cell	
<b>Haryana</b>	Toilets, Hand Pump, Boundary Wall, Single Classrooms, Cluster Rooms, Additional Two Classrooms BRCs, New School Buildings, Additional Three Classrooms.	Community Participation  Panchayati Raj Engineering Department National Competitive Bidding	In-House Engineering Cell  Panchayati Raj Engineering Department  In-House Engineering Cell	
<b>Karnataka</b>	Toilets, Hand Pump, Boundary Wall, Single Classrooms, CRCs, Additional Two Classrooms, New School Buildings, Residential schools BRCs	Force Account  National Shopping Procedure	Zilla Panchayat Engineering Dept.	
<b>Kerala</b>	Toilets, Hand Pump, Boundary Wall, Additional Classrooms, New School Buildings, CRCs BRCs	Community Participation (Parent-Teacher Association)  National Competitive Bidding	Hired Agency (Small Industries Development Corporation Ltd.)	
<b>Madhya Pradesh</b>	All Works BRCs, New School Buildings, Repairs, Additional Classrooms	Community Participation	BRC, In-house engineering cell in six DPEP-I districts	Rural Engineering Services
<b>Maharashtra</b>	Toilets  Drinking Water  One Room & Two Room Schools BRCs Centre for Science in Villages	Community Participation  Force Account - State Ground Water Survey Board (SGWSB) Community Participation  NSP (CSV) - An NGO	In-House Engineering Cell  SGWSB engineers  In-House Engineering Cell  In-House Engineering Cell	Zilla Panchayat Engineering Department  Zilla Panchayat Engineering Department  CSV engineers
<b>Tamil Nadu</b>	BRCs, New Schools, Toilets, Drinking Water, Repairs	NCB Force Account - Public Works Department, Tech. Edu.	PWD, DPEP District Consultant	PWD

In remote areas, the process of contracting out works is sometimes delayed due to insufficient responses from contractors.

(PWD), while Maharashtra is undertaking drinking water provisions through the same system.

The experience of works done through Force Account, has been that the involvement of the community with the construction and other aspects has been very low. This is a significant drawback of the system. However, there are various sites which are rather remote.

#### **The Experience of DPEP-I Implementation Systems**

- The experience of DPEP-I has been recognised by most states. All DPEP-II & III states are taking up a majority of works through the community. They are also creating In-House cells for the supervision of works.
- A norm of at least one engineer per block has by and large been accepted by the states. Now, a few states have realised the benefits of having supervisors for every 4-5 sites. (10 districts of Rajasthan which are in the pipeline, have also proposed a similar system.)
- Supervision through departmental engineers has not been adopted by most of the states. Of the DPEP-II & III states, only Uttar Pradesh has adopted this System. While Haryana and Maharashtra, have discontinued this system, Madhya Pradesh, continue to follow the same procedure.
- There is a gradual increase in the engineering staff being provided for supervision. From a situation where there was less than one engineer per block (at the commencement of the programme) there is now an increasing number of states appointing supervisors for every five sites. (Andhra Pradesh and Bihar have already done so. West Bengal and Rajasthan are planning to do so).
- In spite of the preference for VEC works, there is a need for Force Account and contractual works to be taken up in some cases, as no one system can be uniformly applied across all sites of work.



Three-room school through National Competitive Bidding in Haryana.

# Programme Highlights

## Community Participation

Community participation has been one of the most significant aspects of the civil works programme. Assam, Haryana, Kerala, Madhya Pradesh and Maharashtra have undertaken a large volume of civil works through community participation and all the DPEP II, III and IV states propose to do so. In Haryana where all the 3 procurement systems have been used, works done through the community have by far been the best both in terms of progress and quality. The success has been so significant that in the expansion districts, Haryana has entrusted larger works to the community.

The graph on the next page shows the proportion of civil works awarded or

proposed to be awarded to the community.

Voluntary contribution in terms of land, labour and material can be seen in various places across the country. Communities have participated in development of school campus, provision of additional facilities like boundary walls, etc. There are examples of the community making contributions to complete the construction of ECCE Centres. Apart from improved quality of construction, the sense of pride and ownership is clearly visible, at sites undertaken by the community.

Community participation has by and large been accepted as a successful system of work. Initial apprehensions about the

**Apart from improved quality of construction, the sense of pride and ownership is clearly visible, at sites undertaken by the community.**

## Community Participation in Civil Works

Works costing less than about Rs. 7 lacs can be undertaken through the community. (In Bihar the limit is pegged at about Rs. 10.5 lacs.) In many states a smaller sub-committee of the VEC is formed that actually shoulders the responsibility of work.

Funds are released to the VEC in three advance installments of 50%, 35% and 15% for larger works and in installments of 75% and 25% for smaller works (like drinking water, toilets, electrification and smaller repairs). The VEC employs the labour, procures materials and oversees the construction. However, it is still the role of the engineering staff to provide regular technical supervision for the work. The frequency of supervision varies with the staffing pattern employed. Site supervisors visit the site virtually on a daily basis.

Community Construction Manuals have

been prepared by most states in order to provide the VEC with necessary information of the work. These are being supplemented with simple, graphical supervision checklists.

Procedurally, the VEC system makes a significant departure from conventional systems of construction. It recognises the community as the natural 'owner' of the infrastructure. It facilitates the creation of a sense of ownership in the village by handing over the power to and responsibility of getting the works done by the community. The community is involved from the stage of making a site available for the construction works. The role of DPEP is limited to providing the necessary funds and technical supervision so that the community can build its own infrastructure.



### Physical targets in DPEP-I



### Financial targets in DPEP-I



■ Contracted Works & Departmental Construction  
■ Community Participation

## VEC Works in Tamil Nadu

For long, Tamil Nadu was a state that was reluctant to undertake works through community participation. However, after an exposure to community participation works and process in other states, a few sites of work were attempted on a sample basis.

In all a total of just nine sites of work were undertaken over four districts. However, the rather small quantity is more than made up for in quality. The works were overseen by the Civil Works Consultant (engineer) at the state level and the consultant engineer at the district level. An intensive process of VEC selection and orientation was followed by daily supervision by the district engineer. Due to a close and regular interaction with the

VEC, a high degree of community involvement was generated. The results have been very encouraging:

- Cost savings of about 20% have been observed
- The quality of construction is by and large very good. The works are actually of a higher quality than the contracted works.
- The pace of construction has been comparable or better than other works.
- Community contribution in terms of supervision and transportation of materials has been significant. In one case the community put in their own funds to construct an extra classroom.

interest and capability of the community were clearly unfounded. While the basic idea of community participation has definitely proved its worth, two factors have clearly emerged as determinants of the success of the system.

#### Representation of the community:

Community participation requires participation of the stake-holders.

Intermediaries who do not have a genuine interest in the work, are unlikely to create a sense of community ownership. The

members of the VEC need to be truly representative of the village of work for the system to succeed. The system followed by Maharashtra (in the first phase) has had representatives at the gram panchayat level who in many cases would not belong to the actual village concerned. The sense of ownership of the village community and of the VEC in this case has been much lower.

On the other hand in states like Haryana, where the VEC members are from the village concerned, the sense of involvement and pride is much higher. (Haryana in fact benefits also from having a lady head of the Village Construction Committee -VCC). Similarly, where the village sarpanch is the head of the construction sub-committee, the involvement of the rest of the village committee is limited. In many states, this problem has been resolved by involving the Sarpanch in a ceremonial fashion but retaining the financial powers with the head teacher and another member of the VEC.

**Provision of technical support:** VEC works allow the engineering staff to focus on what they can do best - provide technical

#### State

Assam  
Haryana  
Kerala  
  
Madhya Pradesh  
Maharashtra  
Andhra Pradesh  
Gujarat  
Himachal Pradesh  
Orissa  
West Bengal  
Uttar Pradesh  
Bihar

#### Mode of "Community Representation" in the Civil Works

Village Education Committee (VEC)  
Village Construction Committee (VCC)  
Parent Teacher Association (PTA) / Village Education Committee (VEC)  
  
Bhawan Nirman Samiti (BNS)  
Gram Panchayat  
Village Education Committee (VEC)  
Village Civil Works Committee (VCWC)  
Village Education Committee (VEC)  
Village Education Committee (VEC)  
Village Education Committee (VEC)  
Village Construction Committee (VCC)  
Village Education Committee (VEC)  
Village Education Committee (VEC)

supervision. Additional (and conflicting) interests like financial control, have been reduced if not eliminated from the system. Where adequate technical staff are able to provide regular supervision for the works, the results have been quite remarkable. This has been the case in states like Assam, Haryana, Andhra Pradesh, Himachal Pradesh, Gujarat and Bihar.

In states where adequate technical supervision has not been provided the system has fared poorly. This also appears to be the case where departmental engineers are expected to undertake a few DPEP works through the community, while simultaneously handling numerous 'conventional' works. This has happened in Madhya Pradesh and Maharashtra. (Maharashtra is in the process of appointing engineers on contract for DPEP-II works.)

Experience has shown that with proper representation and technical support, VEC works are of better quality, lower cost and usually at a similar pace as works undertaken by departmental engineers in isolation.

### **Innovation Fund**

A special Innovation Fund of Rs. 50 lakhs has been allocated per state. This allows for the preparation of new designs, identifying / adopting alternate technologies and various activities associated with these ends, like the orientation of engineers / VEC, etc. The basic purpose of the fund is to encourage innovation. Virtually, any activity can be taken up that attempts to approach the implementation of civil works in an innovative fashion.

The Innovation Fund provides an excellent opportunity to study available materials and technologies, evolve cost effective designs based upon these materials and technologies, test these designs on field through prototype constructions and train engineers and VECs on such construction. Training of engineers on good construction

practices (in conventional construction) is also an activity that can be taken up through the innovation fund.

The Innovation Fund is being used primarily to undertake resource mapping exercise to identify and construct with alternate technologies. It is also being used to train engineers in these and conventional technologies. In many state the design renewal activities are also being undertaken through the Innovation Fund.

### **Alternate Technologies**

Assam, Karnataka, Madhya Pradesh and Uttar Pradesh have conducted a detailed resource mapping exercise as a prelude to evolving cost effective designs based on alternative technologies. Haryana is in the process of doing so. Himachal Pradesh, Gujarat and Bihar are also likely to initiate resource mapping exercises.

Karnataka and Uttar Pradesh have already initiated the process of prototype constructions through alternative technologies. Assam is expected to follow soon.

Due to the experience gained in the Bihar Education Project, DPEP in Bihar is already undertaking all construction through cost



## Innovation Fund Status

### A Summary

#### DPEP-I

##### Assam

Assam has utilised the Innovation Fund for undertaking a comprehensive resource mapping and design renewal exercise through three agencies. Prototype constructions are to be undertaken soon.

##### Haryana

Consultants have been appointed for preparing additional designs and resource mapping. These are underway and the entire exercise including the construction of prototypes is scheduled to be completed by Dec.'98.

##### Karnataka

An agency (D.A) has conducted and completed the resource mapping exercise. New designs have also been prepared by D.A and will be undertaken for prototype construction.

##### Kerala

No activities have been initiated under the Innovation Fund so far.

##### Madhya Pradesh

Madhya Pradesh conducted a successful resource mapping and design renewal exercise through their Innovation Fund. Further activities as well as the involvement of national agencies are being worked out.

##### Maharashtra

Innovation Fund activities will be taken up after the design renewal exercise.

##### Tamil Nadu

Innovation fund activities are proposed in the coming year plan (1998-99) after the Cross State Workshop on civil works.

#### DPEP-II

##### Andhra Pradesh

The state has appointed a consultant for Innovation Fund activities. Not much progress has been made in this regard.

##### Gujarat

A consultant, ASAG, has been appointed for the preparation of designs and the construction of prototypes. The construction of prototypes would commence soon after the designs are finalised and approved.

##### Himachal Pradesh

The earlier Innovation Fund proposal has been found to be unacceptable. The state needs to revise its strategy in this matter.

##### Orissa

Innovation Fund activities have not yet been initiated. They are to be taken up after civil works activities are properly underway.

##### Bihar

Since most of the earlier BEP buildings were constructed through alternative technologies, fresh initiatives have not been proposed under the Innovation fund.

##### Uttar Pradesh

Consultants were appointed for the design renewal, resource mapping and prototype construction. The resource mapping exercise is complete and the prototype constructions are to be taken up soon.

##### West Bengal

The state is yet to initiate steps in the direction of utilising the innovation fund.

effective technologies. The focus is to interface the construction of prototypes with the regular works as far as possible. There is an effort to link the construction of the prototype with ongoing training of a few engineers at each site. However, the large scale use of alternative technologies in the main programme would take some time.

#### Design Renewal Background

Before DPEP-II, most states had rectilinear type designs for schools. These designs were

largely similar to Operation Blackboard and standard PWD designs which had been used in the past. These designs hardly reflected any concern for the child's needs. They were typical designs constructed with the same kind of materials and technology all over the state – even if such materials and technology were unsuitable for a particular region.

Consequently it was felt that entirely new designs had to be prepared which would respond to the new teaching practices and the pedagogical needs of the children. Local

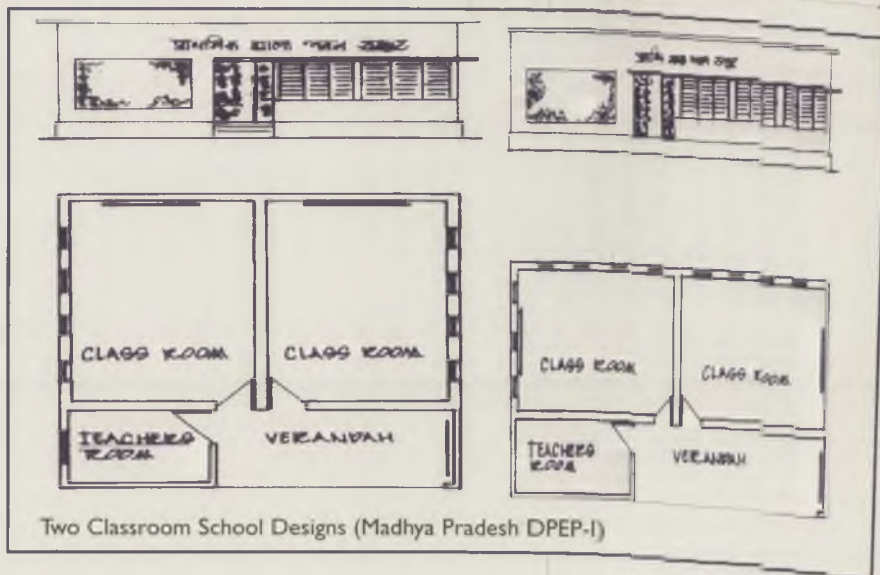
materials and technology also needed to be adopted, so that the community could identify themselves with such schools.

The essential brief for the design renewal of schools has been simple: to prepare designs that are sensitive to the context of the school, both in terms of the pedagogic system as well as the rural conditions of over crowding, need for additional spaces, etc.

### What makes a room a classroom?

Pedagogical renewal is one of the corner stones of the District Primary Education Programme. To assist in this, in the second phase, DPEP has undertaken an extensive design renewal process. This has included all facilities including schools, BRCs, CRCs, etc., and has happened through the appointment of state specific and in some cases district specific consultants.

At this stage, most states have either completed this exercise or are near completing it. The designs have shown a distinct improvement from the traditional box type school. The pedagogical and local focus have thrown up various new ideas. Various improvements have now become standard in all school designs.



All new school designs have at least two chalkboards for the teachers apart from children's chalkboards. (As before chalkboards are also provided in the verandahs and on the external walls.) Verandahs in the traditional school design were often of uncomfortable dimensions for students to be able to view the board properly. Such aspects have been taken into account in the design of the verandah. All classrooms have provision for display hooks, boards, ledges, shelves, lockable storage, etc., to ensure maximum storage and display space in the classroom.

## Design Renewal—Facts and Figures

A total of 42 external consultants have been involved so far in twelve states. Four states appointed district specific consultants while a total of nine states appointed more than one consultant. In two states (Maharashtra and Tamil Nadu) the office of the Chief Architect (PWD) has been involved in the preparation of designs.

The experience of appointing district specific consultants has been very positive. In Madhya Pradesh as many as 11

consultants have been involved. This has resulted in a larger number of context sensitive designs. In comparison, states where only one consultant is involved, have been prone to delays. Gujarat is a case in point. Though context sensitive designs have been prepared, this happened after much delay.

In all, about a hundred designs have so far been approved and many more still have been prepared.

The design renewal exercise is based on the understanding that the school and classrooms are fundamental teaching aids.

The classroom design and details facilitate activity based learning. Classrooms tend to be centric spaces rather than rectilinear ones. Display and storage spaces are provided in ample measure. This includes cupboards shelves, ledges, tackboards, hooks for hanging charts, etc. In general two teacher's chalkboards and low level children chalkboards are provided in all classrooms. Green boards are preferred to black ones to minimise visual fatigue.

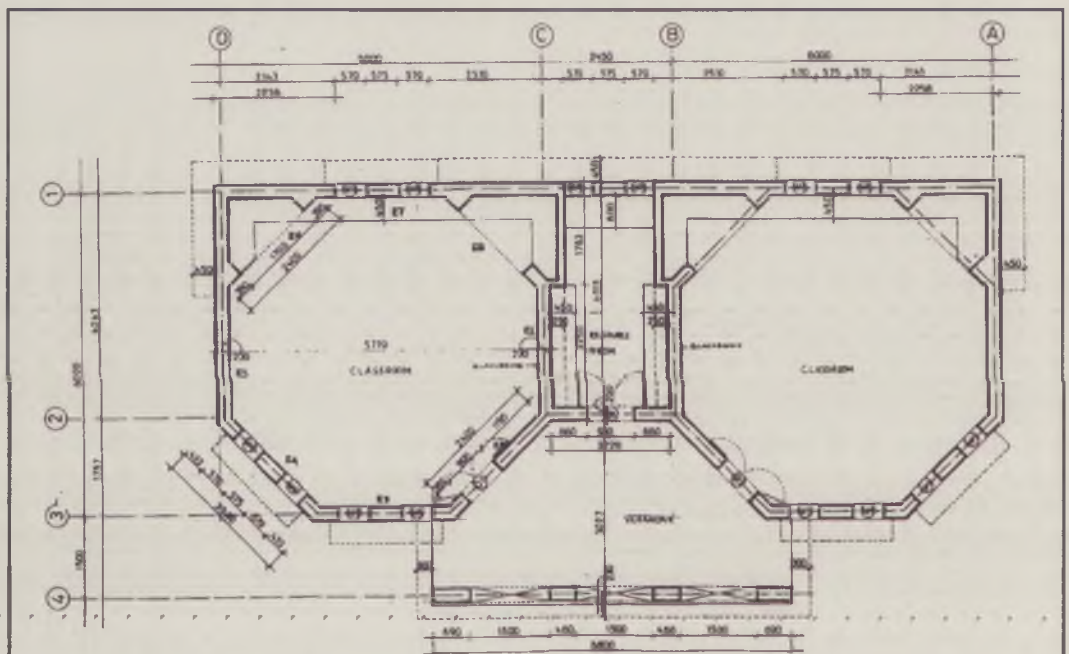
The designs from Madhya Pradesh have been based on a clear focus on local materials and systems of construction. The school designs have also examined possibilities of internal and external informal teaching spaces, classroom shapes, single teacher scenarios, etc. The state has also succeeded in throwing up extremely articulate BRC designs that truly imbibe the idea of informal spaces and courtyards in conjunction with the training hall.

Designs prepared by Karnataka have examined the use of informal spaces and developed classrooms that have emerged

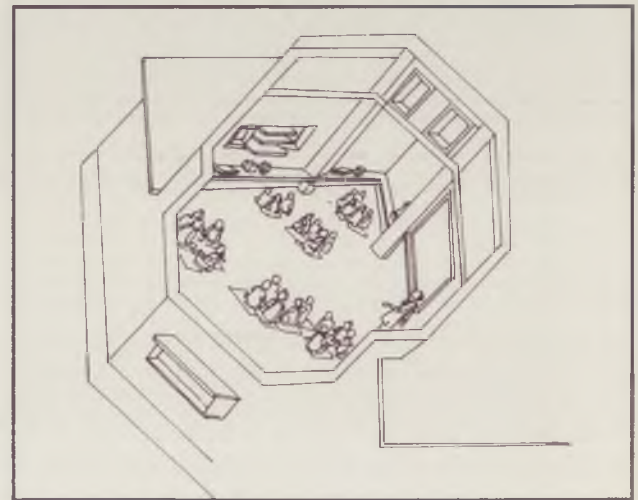
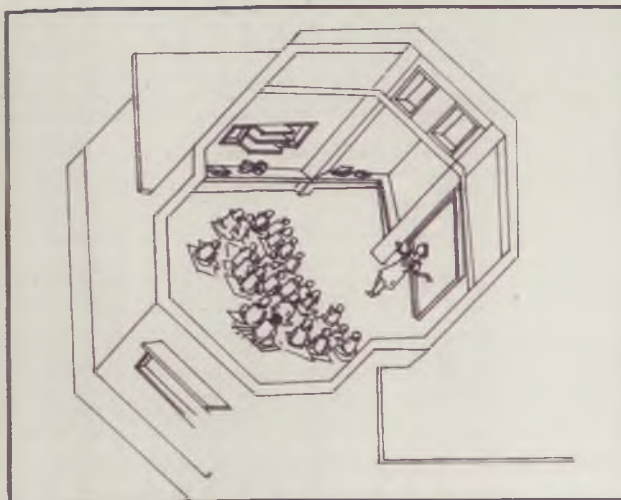
from the activity/ learning requirements.

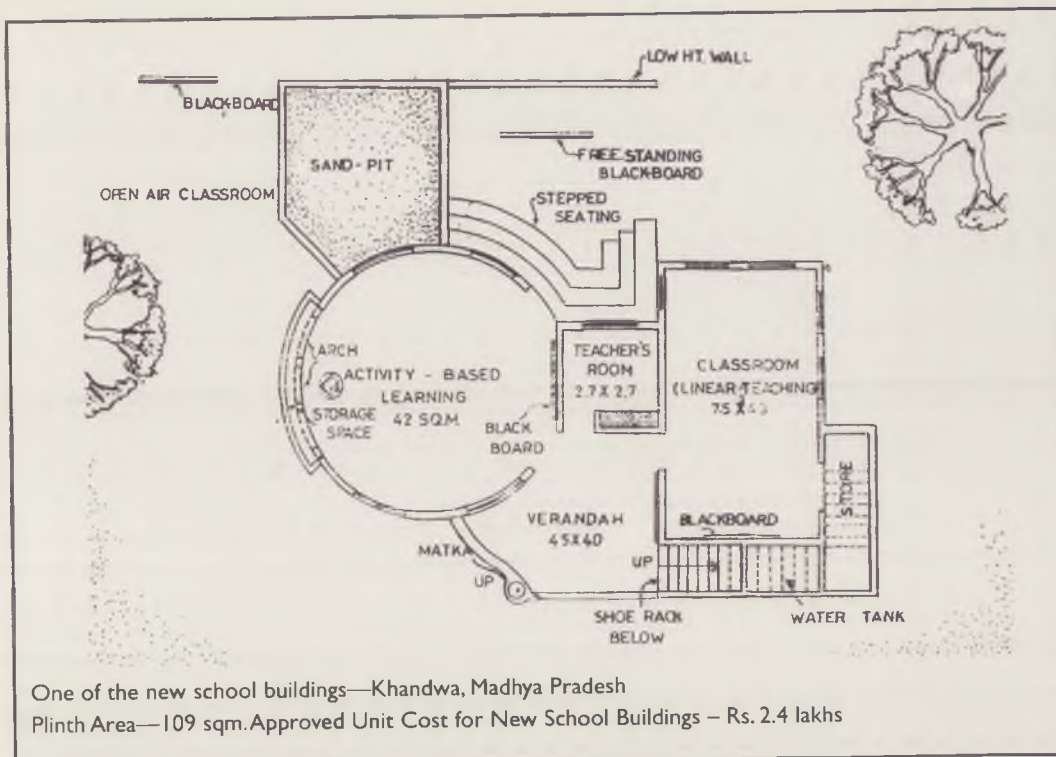
The designs from Assam have also been prepared by consultants who have examined district specific conditions. The BRC designs in particular have been prepared with district conditions in mind.

Gujarat has examined various options and possibilities in its designs. This includes the preparation of designs that are modular and incremental. The requirement of handicapped children have been focussed on in their designs.



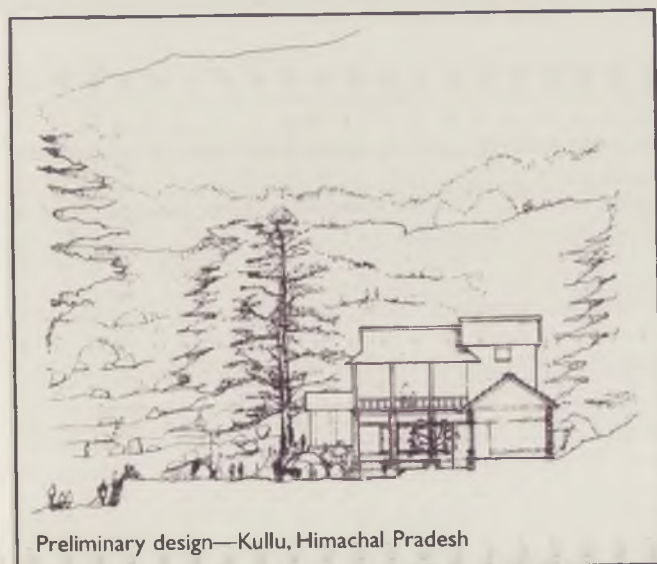
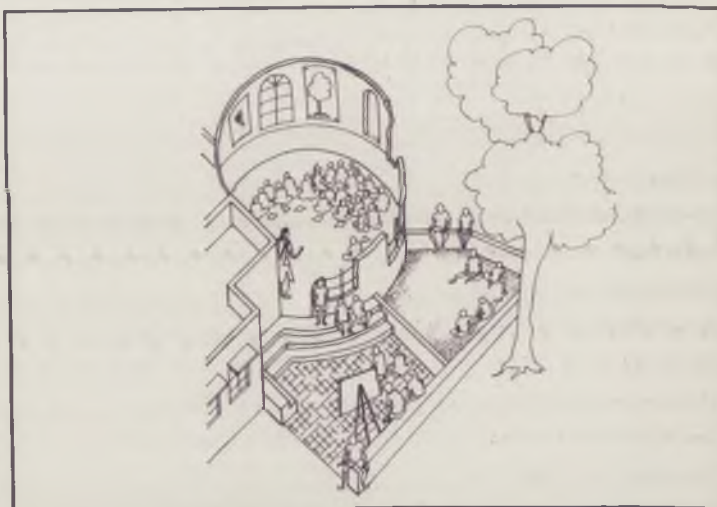
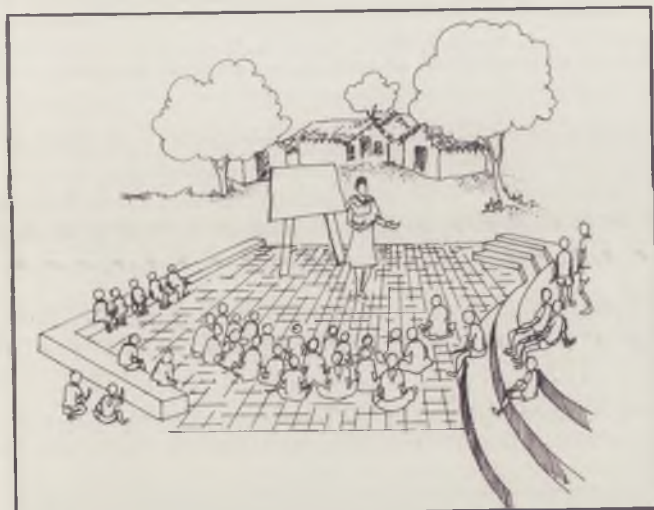
One of the new school buildings—Karnataka  
Plinth Area 100 sqm. Estimated Cost – Rs. 3.6 lakhs (inclusive of toilet and drinking water)



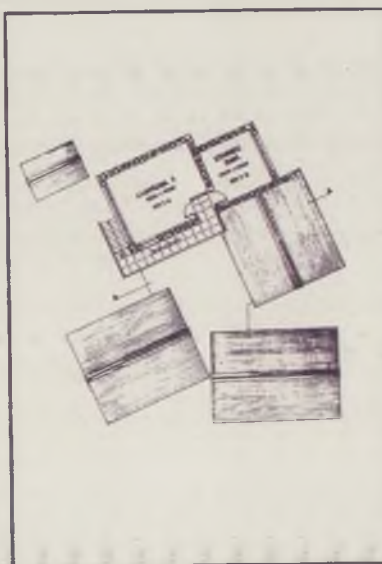


One of the new school buildings—Khandwa, Madhya Pradesh  
Plinth Area—109 sqm. Approved Unit Cost for New School Buildings – Rs. 2.4 lakhs

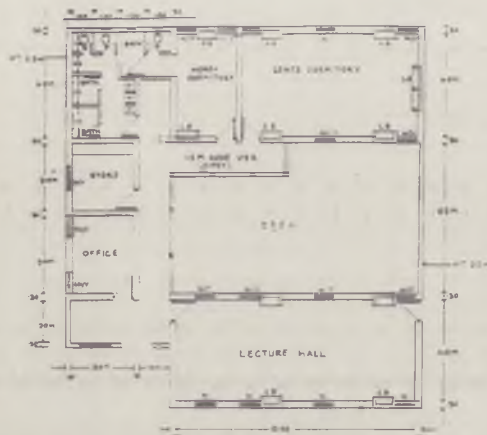
The designs focus on the rural/village context of the school. Specific considerations include designing for multi-grade situations through the provision of additional chalkboards. Designs are also prepared for situations where the number of teachers is less than the number of classrooms. An attempt is also made to mitigate the effect of overcrowding by providing informal teaching spaces in conjunction with the classroom.



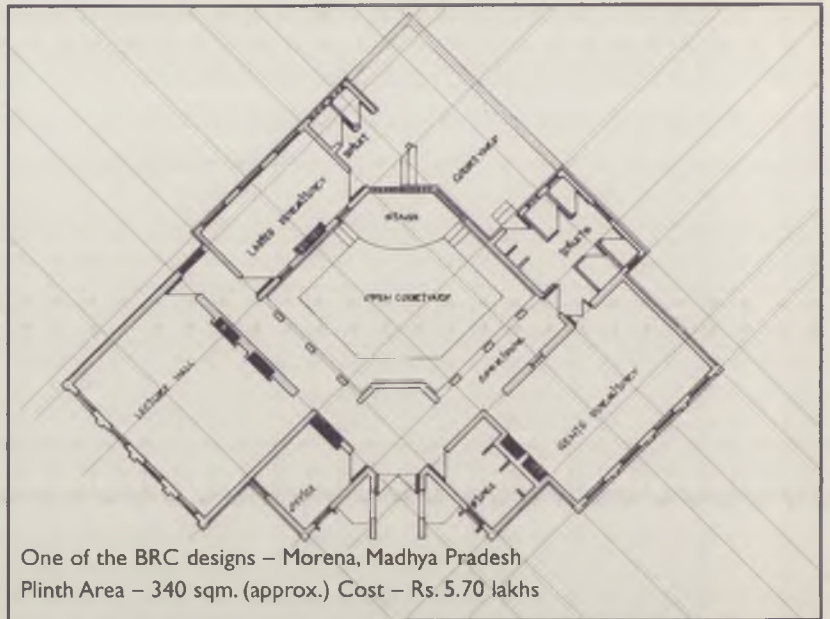
Preliminary design—Kullu, Himachal Pradesh



District and state specific considerations have been kept in mind. Local architecture materials and techniques of constructions find expression in some of the designs prepared by the consultants.



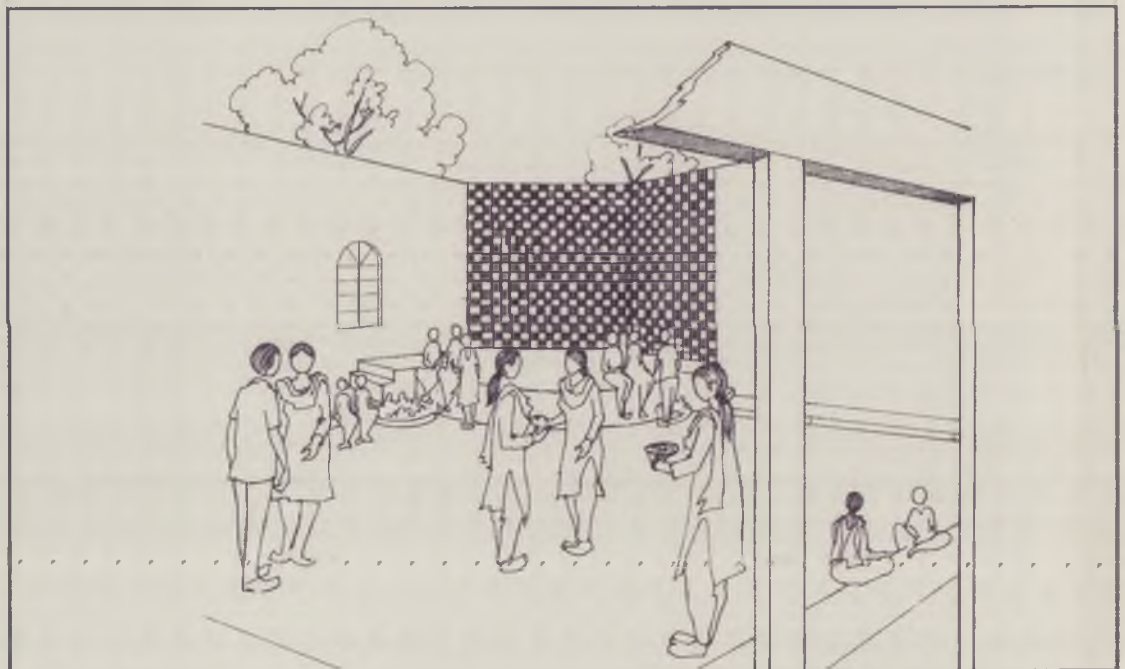
BRC design in Madhya Pradesh, DPEP-I  
Cost – Rs. 5.40 lakhs



One of the BRC designs – Morena, Madhya Pradesh  
Plinth Area – 340 sqm. (approx.) Cost – Rs. 5.70 lakhs

Discussion and debate on teaching practices and materials are important for the long term sustainability of the programme's educational interventions. The BRC has provisions for a training hall, office and dormitory (where required). In addition, there is a thrust towards providing spaces that facilitate informal and spontaneous group discussions. This finds expression in the form of stepped courtyards and informal spaces in conjunction to the dormitory and training hall.

Different BRC designs have been prepared by the states that consider these and other local requirements.



Completed BRC in Sitamarhi, Bihar, under BEP  
Plinth Area 363 sqm.  
Cost – Rs. 9.5 lakhs

Uttar Pradesh involved five consultants to prepare designs that have a focus on cost effective solutions that build upon local skills and construction systems. Many of the new designs have a very strong focus on pedagogic requirements of classroom shapes and interactions, as well as display and storage space.

The design renewal process is in a sense complete in many states. New designs have been prepared and approved. However, this is just the beginning of the implementation

exercise which now needs to establish a clear understanding among site engineers and the VECs about basic classroom requirements. This implies ensuring that all schools are constructed with well designed and good quality chalkboards, childrens chalkboards, flooring, display, storage, etc.

The exercise now goes into its logical next phase of bringing a greater sensitivity among all people associated with actual school construction.

### Design Renewal Status A Summary

Assam	Haryana	Karnataka	Kerala	Madhya Pradesh	Maharashtra	Tamil Nadu
Assam has undertaken a comprehensive design renewal exercise. Selected designs were forwarded to the Bureau and have been approved.	Haryana prepared designs through the Chief architect and in-house. A few designs have been approved. In addition, consultants have been appointed for additional designs through resource mapping. These are underway.	The design renewal exercise was undertaken through two consultants and designs have been approved. New designs have also been proposed by the resource mapping agency.	Consultants have been appointed for the preparation of designs. So far no designs for DPEP-II have been sent to the Bureau.	Madhya Pradesh continues to take the lead in the design renewal exercise. After a successful resource mapping and design renewal exercise, further strategies need to be worked out.	Maharashtra has just decided to use the services of the Chief Architect G.O. Maharashtra for the design renewal exercise.	The state undertook the design renewal exercise through the Chief Architect. Designs have been approved.
Initial proposals from 5 consultants	3 consultants apart from the Chief architect	2 consultants in addition to the resource mapping consultant	2 consultants	11 consultants	Chief architect	Chief architect
Andhra Pradesh	Gujarat	Himachal Pradesh	Orissa	Bihar	Uttar Pradesh	West Bengal
New designs, partly based on APPEP designs have already been approved.	A contract has been signed with ASAG for the preparation of designs. A few designs have been approved.	Himachal was one of the first states to get it is designs approved. The state subsequently prepared a new set of designs some of which have also been approved.	New designs have been prepared, approved and are ready for construction.	Bihar has already gone through the design renewal exercise under BEP. Therefore there is no requirement for approval of fresh designs.	Construction started on the basis of old BEP designs. New designs have been approved and are being finalised.	The state is to initiate steps in the direction of design renewal. One in-house school design (and one additional room) have recently been approved.
1 consultant	1 consultant	4 consultants	4 consultant	not applicable	5 consultants	



# Present Focus Areas

Though a lot has been achieved in these four years of the programme, specially in terms of developing processes, a lot more needs to be done to strengthen these processes and utilise them to serve the project objectives.

## Infrastructure Requirements

Since universal access is a primary concern of DPEP, providing school buildings is a basic requirement. However, this is a particularly critical area due to the large infrastructure gaps that exist. In certain states where the expenditure on primary education has so far been low, significant shortfalls will remain even after DPEP (see box on the next page). While these gaps would vary across the states, it is quite clear that the entire infrastructure requirement of a district is unlikely to be provided through DPEP alone.

The programme tries to meet the challenges posed by such severe resource constraints. It emphasises the importance of the convergence between DPEP and other sources of funds like the JRY scheme, MP / MLA funds, etc., for the funding of school infrastructure.

Repairs are being prioritised in a more significant manner in the second phase of the programme. An attempt is also being made, in all states, to develop cost effective systems of construction and over time, integrate them into the regular systems of construction.

## Convergence

In the initial DPEP I districts, convergence was limited. There has been an instance of a school with three handpumps, each constructed under a different scheme. However, as the programme progressed, there has been increasing convergence with other schemes.

Most states have various departments providing infrastructural facilities for schools. The District Rural Development Agency (DRDA) in most states is engaged in construction of schools, classrooms and repairs. These are generally constructed through the JRY funds, MPs fund and other schemes. In tribal districts, funds from the Tribal Welfare Department are available. Funds are also available for provision of water supply facilities. In some cases, the

Existing school in West Bengal – overcrowding in schools is a major concern in some districts



## Infrastructure Gaps within DPEP

A sample Access Study of eight of the 42 DPEP-I districts was commissioned in mid 1997. This study revealed the large infrastructural gaps that would still remain in many districts even after DPEP.

Dhubri in Assam is estimated to require an additional Rs. 24.39 crores (in 2001) based on the expected enrollment growth. This figure was estimated to reduce to Rs. 18.05 crores if the district could adopt a system of double shifts in the schools. This is beyond the expenditure for civil works within DPEP, which, as per the ceiling of 24% is Rs. 7.07 crores in Dhubri. At the lower end, Thiruvannamalai in Tamil Nadu would require an additional Rs. 6.31 crores in the year 2001. However, if the logistics of the logistics of a double shift system could be

worked out, this gap would reduce to just Rs. 0.45 crores. (The civil works expenditure in Thiruvannamalai will be limited to Rs. 9.75 crores).

What the study reveals is the fact only a few districts, at best, could be expected to provide for the entire requirement for infrastructure through DPEP provisions alone.

To minimise the gaps, the study recommended:

- raising the civil works ceiling within DPEP,
- maximising convergence with other schemes (to the extent that other schemes are operational in the district),
- focussing on repairs to maximise the additional space created and
- adopting a double shift system to reduce the need for new infrastructure.

state Government has significant programmes of constructing large number of schools through their own resources.

States like Andhra Pradesh, Madhya Pradesh and Uttar Pradesh, where the requirements for infrastructure are huge, have taken positive steps in this direction. Andhra Pradesh has proposed to take up the entire programme of repairs, toilets and drinking water facilities through convergence. UP is building all new school buildings through a convergence of funds.

A major thrust is required on comprehensive planning in the AWP&Bs for convergence. At the district level, DPEP needs to provide a platform for concerted and co-ordinated intervention, in the area of primary school infrastructure.

### Cost of Construction

Most states, by now, have gone through the design renewal process and are ready with child friendly designs suited to the new pedagogical concepts. States are also preparing cost effective design solutions. A comparison of the cost/sft of the BRCs,

## Convergence of Funds

**Uttar Pradesh:** UP is a step ahead of all other DPEP states. All the proposed school buildings are going to be constructed through convergence with other schemes like JRY. 60% of the cost of building will be provided from JRY/other state government funds and remaining 40% will be from DPEP. This DPEP and JRY funds will be diverted into DMs fund at district level.

**Andhra Pradesh:** In the expansion districts of DPEP, AP has proposed to construct only school buildings and Mandal resource centres. All the other facilities like drinking water, toilets and repairs are proposed to be undertaken through other state government schemes. This allows DPEP to focus its construction activities in certain priority areas yet ensuring that other necessary facilities are provided.

**In certain districts significant infrastructure gaps will remain even after DPEP interventions.**

### Comparison of costs in DPEP - I

States	BRC		School building	
	unit cost Rs. Lakh	cost/sq.ft. Rs.	unit cost Rs. Lakh	cost/sq.ft. Rs.
Assam	8.5	220	2.5	160
Haryana	10.5	222	6.5	330*
Kerala	4.6	238	1.2	177**
Karnataka	5.00	280	2.3-2.9	212-267
Madhya Pradesh	5.4	237	2.24	211
Maharashtra	7.75	235	2.9	245
Tamil Nadu	3.9	295	294	334

\* Including Toilet, Boundary Wall and Drinking Water provisions

\*\* One room school

schools and additional classrooms across the states is shown in the table in next page. As is evident from the table unit costs vary widely. Though the per sft cost for schools is usually more than that of the BRCs, the cost of schools is considerably high in states like Tamil Nadu and Karnataka.

There is a need to try and reduce costs. Even a marginal reduction in the cost of a school would lead to considerable cumulative savings which would help in providing additional infrastructure. The experience so far reveals two primary means of cost reductions:

**Community participation:** Through a



Community participation and the use of appropriate materials and technologies can bring about significant cost savings.

combination of contribution and the absence of a 'profit motive' VEC works always imply cost savings. Tamil Nadu provides a very clear comparison. Nine sites of VEC works have been taken up in similar circumstances to where works are being contracted out. For the same design the cost savings have worked out to be about 20%. This does not include the cost of an extra classroom which in one case has been borne by the village itself. This implies a reduction of the current cost from about Rs. 330 per sft. to about Rs. 270 per sft.

Since the works were estimated at the same contracted rates, there is no reduction in the actual expenditure on each school building. The savings have resulted in the schools begin provided with an additional verandah. Cost savings need to be built into the estimates to allow it to translate into additional schools.

In Andhra Pradesh, community contribution has amounted to Rs 1.09 crores against total DPEP expenditure of Rs. 13.56 crores (about 7.5% of the total investment) over the last two years. Though it is not an official requirement, up to Rs. 30,000/- per school has been contributed by the community. There have been instances where villagers contribute through *shramdhan* (voluntary labour) by working on the site at night.

**Use of appropriate materials and technologies :** A large civil works programme cannot expect highly skilled masons and labour at all places of work. Cost savings would be built in through rationalisation of designs rather than highly skillful construction. Centralised specifications can lead to situations where materials which are not locally available are used. This automatically results in increased costs of transportation. Substitution of materials in such situations can bring in significant savings. Similarly, a rationalisation of the designs and construction of the foundation, walls and roofs results in significant cost savings. Bihar is a case in point where such substitutions have been

done. The results have been significant. Cost of construction as low as about Rs. 100-150 per sft. have been reported. This has led to the construction of extra classrooms in many schools.

Cost effectiveness requires a concerted effort in these directions. It can be brought about only through an underlying thrust on this aspect in the entire construction programme.

## Repairs

Dilapidated buildings or buildings requiring various kinds of major or minor repairs is a common sight in rural areas. The effective space utilization of such buildings is grossly reduced resulting in students crowding into the better parts of the building or sitting outside (in absence of adequate usable space inside). However, very little is done to repair these buildings. This is unfortunate as repairs cost less than building new schools but the small investment leads to a large increase of usable area.

Most of the DPEP districts proposed repair works as part of their civil work activities. This was sensible planning as repairs help in



Fly-ash bricks are used for construction of toilets in Orissa.

creating larger amount of usable space with a lesser cost. States like Assam, Madhya Pradesh, Karnataka, Haryana and Tamil Nadu have already executed a large repairs programme in DPEP I. Except for Karnataka, Madhya Pradesh and Andhra Pradesh, all other states are presently executing their repairs programme or are expected to do so within the next year.

However, most of the DPEP I districts did not follow a clear strategy on repairs. The



School building before repairs (inset) and after repairs - Himachal Pradesh.

## Repair Strategy in Gujarat

The repairs process in Gujarat was well conceived and efficiently executed. The process included:

**Devising the system of Surveys:** Comprehensive planning was undertaken prior to the survey of school buildings. Technical survey formats were prepared and a computerised system was prepared to assess the data thereby obtained. The system was designed to allow the classification of sites surveyed based on different criteria, inclusive of the enrolment in the school, estimated cost of repair, tribal / non-tribal area, etc.

**Survey of Schools:** A survey process was undertaken through the in-house engineers (appointed on contract). The survey was undertaken block by block, with all engineers of a district (6-7) surveying the block at one time. Details of accessibility of schools were taken into account and the use of vehicles was accordingly optimised.

**Estimation of repair cost:** The survey format was prepared to allow simple estimation from the survey. A comprehensive list of the types of repair problems was prepared. The rate analysis of each item was also done. This allowed the estimate to be prepared based on measurements made and recorded on site.

**Prioritisation:** The survey measurements were fed into the computerised system

developed. This automatically estimated the quantity of work and allowed classification of the sites on various areas of priority for the State Project Office. Sites were evaluated on the basis of the cost estimate, enrolment and tribal / non-tribal parameters.

**Implementation:** Engineers were involved in forming the Village Civil Works Committee (VCWC) a sub-committee of the VEC. A one day orientation programme was organised and the cheques were handed over to the VCWC by the engineers after the opening of the Bank Account. Regular supervision was provided during the implementation of works.

Various checks and balances were incorporated into the system. In addition to the State Project Engineer (SPE), the state level civil works consultant was also involved in assessing the surveys, estimation and execution of works on a sample basis. Sites of work were photographed prior to and after repairs and have been maintained as a record of work.

Gujarat presents a good pattern for repairs for other states to examine. A similar system has also been undertaken by Himachal Pradesh. Survey systems have been prepared at the district level. In district Kullu for example, the system has included detailed surveys, analysis of costs based on market rates and the state schedule of rates, as well as photographs & drawings indicating the repairs required.

process of implementation of the repairs programme therefore has to be streamlined. A clear system of identification of repairs requirements through survey and prioritisation needs to be developed. A system of execution and supervision of such works also need to be thought of. Transparency and accountability are essential in carrying out the repairs programme.

Though Gujarat has developed an efficient system for carrying out repair works, most other states are still unclear about it. It is a focus area in the present year whereby all states would be provided inputs at various level to work out their state specific repairs

strategies and develop manuals/guidelines as required.

### Training for VECs & Engineers

Two types of training are being conducted for the Engineers.

- Procedural i.e Orientation to DPEP
- Technical training

An orientation programme is conducted for all the engineers in DPEP. This is mainly to familiarise the engineers with its procedures, construction work through the community, roles & responsibilities of VEC and Engineer, etc. The community construction manual is also explained and shared with the



Pre-casting yard  
Nirmithi Kendra, Kerala

engineers during this orientation programme.

Most of the states like (Haryana, Andhra Pradesh, Gujarat, Orissa, Himachal Pradesh) have already finished the first round of orientation programme. It has been felt that this training needs to be modified &

strengthened based on the field experiences and must be conducted at regular intervals (at least twice a year).

Technical Training for the Engineers also plan in three areas namely:

Good Construction Practices, Management / Site-Management aspects, Cost-Effective Technologies

## Engineers Orientation Programmes

Two states, Haryana and Bihar have taken the lead in technical training.

**Haryana:** A five day residential training programme on good construction practices was conducted. This training included practical demonstrations as well. This training programme was conducted through an agency, the National Council for Cement and Building Materials, Ballabgarh.

**Bihar:** A twelve day residential programme was conducted for all the AEs and JEs through the Bihar Engineering College. This was an orientation cum technical training. In addition to the above, a training programme on cost-effective technologies has been conducted. Practical, hands on training has been given to all the engineers from ten districts in alternate technologies.

## Project Planning and Monitoring

Civil Works in DPEP presents an unique challenge, not only because of the sheer number of buildings being constructed in a relatively short period of time but also because of the conditions of work. The delivery and supervision systems being adopted in most cases are also novel in nature. As a result, conventional project planning and monitoring techniques are not always suitable—they need to be modified and refined to address to the requirements of the programme. Most states have done this in their own way to suit their requirements. As a result all states have an established system of flow and reverse flow of information. States like Gujarat have developed a computerized planning and monitoring system—such systems are expected to be developed by more states in the future.

# Conclusion

DPEP faces the ambitious task of providing the necessary infrastructure for the Universalisation of Elementary Education, from the viewpoint of Access, Retention and Improving the Quality of Education. The civil works programme has been conceptualised keeping in mind the contextuality and resource constraints present in the country. This has resulted in the development of a complex programme in which no two states follow the same system.

The sheer volume of infrastructure provided so far through the programme is significant. DPEP is by far the largest intervention of its kind in the districts. Unlike many developmental schemes it has provided the entire gamut of school infrastructure, from drinking water and toilet facilities, to schools and additional classrooms, as well as cluster and block level resource centres. DPEP has

approached the problem of infrastructure in a holistic manner. The numbers tell their own story. What is of significance, however, is the process followed.

A review of the situation makes it plainly clear that the programme has recognised both the diversity as well as the resource constraints that the programme faces. The civil works programme has made definite strides towards addressing these issues in a large nation wide programme. This is evident in the holistic, yet contextual character of the programme. In spite of the pressing immediate and operational problems that the programme faces, it continues to retain sight of the basic objectives of the programme. The most significant sign of vitality is the fact that after four years, there is still an intense attempt at innovation in the areas of school design,

DPEP is by far the largest intervention of its kind in the districts. Unlike many developmental schemes it provides the entire gamut of school infrastructure.





cost and techniques of construction, supervision systems, etc. It can be safely said that DPEP is a programme that is growing and adapting to the changing requirements.

This learning is evident in virtually all areas of the programme:

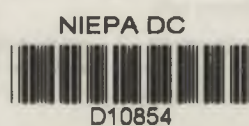
- Civil Works planning has improved significantly since the early years. Concerns in planning still remain in some of the new states. Convergence is one area that has not yet received the amount required of detailed planning from all states.
- Pedagogical concerns have come into clear focus in the past year. From a set of very conventional designs in DPEP-I, the second phase has already generated over 100 approved designs which incorporate state and district specific concerns. The requirements for multi-grade teaching, appropriate teachers and children's blackboard, display & storage facilities, etc., are now a standard part of all design. The basic design of the classrooms has also undergone a total overhaul in the past year.
- The adoption of alternate technologies and cost effective systems of construction is slowly gaining momentum. A few states are

commence the construction of prototype buildings with alternate technologies. The state of Bihar is a example to others, where all works in DPEP are being undertaken through cost effective technologies. The process of constructing prototypes and integrating these system into the regular works now needs to be undertaken.

- Community participation is another area which has gained wide acceptance. All states in DPEP-II are undertaking works through the community. Supervision and staffing systems have also been greatly strengthened. It is heartening to find that staffing patterns continue to be rationalised/strengthened in many states.

Civil Works is now entering the stage where there is a greater focus on widening the impact of these interventions. The programme now needs to provide a platform in each district for a concerted effort towards addressing infrastructure requirements. The area of Convergence is great significance in this.

Civil works under DPEP is now in a position to provide valuable experience in addressing or school infrastructure : the country.



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Date 11-09-2000



Block Resource Centre  
National Institute of Educational  
Technology, Ministry of Education,  
17-B, Sector 14, Gurgaon, Haryana  
New Delhi - 122006  
Date: 11-09-2000

# Abbreviations

AEE	- Assistant Executive Engineer
AE	- Assistant Engineer
BEP	- Bihar Education Project
BRC	- Block Resource Centre
CRC	- Cluster Resource Centre
DEE	- District Executive Engineer
DIET	- District Institute of Education and Training
DPEP	- District Primary Education Programme
DPO	- District Project Office
DRDA	- District Rural Development Agency
ECCE	- Early Childhood Care and Education
JE	- Junior Engineer
JRY	- Jawahar Rozgar Yojana
NCB	- National Competitive Bidding
NSP	- National Shopping Procedure
PTA	- Parent-Teacher Association
PWD	- Public Works Department
SCERT	- State Council of Educational Research and Training
SDE	- Sub-Divisional Engineer
SIEMT	- State Institute of Educational Management and Training
SIDCO	- Small Industries Development Corporation Ltd.
SPE	- State Project Engineer
SPO	- State Project Office
TRP	- Technical Resource Person
UEE	- Universalisation of Elementary Education
VCC	- Village Construction Committee
VCWC	- Village Civil Works Committee
VEC	- Village Education Committee
ZPED	- Zilla Panchayat Engineering Department