Keeping these factors in view the basic strategy for development programme of Bangladesh Railway is to improve, consolidate and modernise the existing system for providing better standards of service, both goods and passengers, by running faster, more regular and reliable trains with long distance through traffic and reducing services for short distance traffic. To secure these objectives, emphasis has been laid on renewal of track, replacement of rolling stock, improvement of existing bridges, modernisation of signalling system, development of terminal facilities and provision of facilities for manufacture and assembly of rolling stock and spares. Stress has also been laid on continuous improvement of technical and administrative efficiency through regular training. Although expansion of the rail network will be subject to detailed evaluation of needs following the study by the Bangladesh Transport Survey, provision has, however, been made for carrying on the construction of on-going projects where substantial capital has already been sunk.

10.2.4 Programmes

Major schemes included in the investment programme of the Bangladesh Railway are—

(a) replacement of rolling stock, plant and machinery, bridge girders and renewal of tracks;

(b) improvement of signalling and tele-communication facilities;

(c) improvement of workshop and maintenance facilities ;

(d) completion of doubling of M. G. track from Chittagong up to Laksham ;

(e) completion of Faridpur-Barisal railway line up to Bhanga.

Although allocation has been made for construction of Khulna and Mongla Railway line and a rail-*cum*-road bridge over the river Rupsa this should be treated as tentative. In view of the recent trend in international shipping for construction of bigger ships, justification for construction of full-fledged permanent port facilities at Mongla has to be thoroughly reviewed. Foreign consultants attached to Bangladesh Transport Survey are currently engaged in an economic study on the justification of construction of permanent port facilities at Mongla *vis-a-vis* additional investment at Chittagong port and construction of a deep draft port near Kutubdia. It has also been decided to undertake a technical study on the feasibility of constructing the deep draft port. Construction of Khulna-Mongla railway line and the rail-*cum*-road bridge over the Rupsa river has to be lined up with the final decision as to construction of full-fledged port facilities at Mongla.

A token allocation of Taka 70 lakh has also been made for undertaking preparatory works for Jamuna bridge. Construction would however, be taken up only after a detailed technical and economic study as to the feasibility of the project.

Allocation has been made for Faridpur-Barisal Railway line which is an on-going project. Out of a total length of 82 miles, construction of 15 miles from Faridpur has so far been completed and has already been opened to traffic. Apparently there is not enough justification for construction of this railway line, particularly when provision has been made for construction of three road bridges between Faridpur and Barisal, poviding through road communication from Faridpur to Barisal. In this context,

it will be necessary to make fresh evaluation of the project as to whether or not the project should be completed or abandoned or completed up to Bhanga only. Allocation made would, therefore, cover the costs for construction up to Bhanga.

10.2.5 Plan Allocations

The total allocation for railway during the First Plan period is Taka 126 crore 12 lakh and 70 thousand including Taka 8 crore 70 lakh for reconstruction of war damages. The allocation under major heads are given below :

TABLE X-9

Allocation for the First Five-Year Plan

(Taka in crore)

Items	On-going.		New.		On-going and new.	
	Total.	F. E.	Total.	F. E.	Total.	F. E.
A. Development						
1. Rolling stock ..	14·350	7·619	40·000	24·000	54·350	31·619
2. Plant and machinery ..	0·441	0·271	0·855	0·620	1·296	0·891
3. Bridge works ..	1·076	0·659	5·700	4·000	6·776	4·659
4. Rehabilitation of track	5·064	2·202	9·000	4·500	14·064	6·702
5. Line construction ..	11·383	1·461	..	..	11·383	1·461
6. Line capacity works ..	..	..	4·493	2·584	4·493	2·584
7. Engineering and other structural works.	5·182	0·463	2·004	0·905	7·186	1·368
8. Construction and modernisation of workshops, storage and depots, etc.	..	..	9·500	5·360	9·500	5·360
9. Signalling, Tele-communication and Radio-wireless works.	0·903	0·018	2·411	1·484	3·314	1·502
10. Marine crafts, etc. ..	0·382	0·332	1·183	0·834	1·565	1·166
11. Training, consultancy and feasibility studies.	..	..	3·500	2·000	3·500	2·000
Total A ..	38·781	13·025	78·646	46·287	117·427	59·312
B. Reconstruction and Rehabilitation Programme	..	..	..	..	8·700	5·791
Total A & B ..	38·781	13·025	78·646	46·287	126·127	65·103

10.2.6 Policies

I. Commercial-*cum*-utility service will provide the guiding principle for running the railway in Bangladesh. Commercial viability in railway operation cannot be ignored while making huge capital investment in this area. Railway should not be allowed to operate on loss and as a subsidised concern.

II. The Railway Board should be reorganised following the report of the Railway Commission in order that it can operate as efficiently as may be necessary to achieve the objectives of providing efficient and cheap services.

III. Railway should not be called upon to carry passengers or goods free or at a nominal rate such as relief goods, defence personnel and stores, etc. Subsidy may be given to the user agencies, if required because subsidy to the Railway distorts the accounting and forestalls proper evaluation of the performance.

IV. Current practice of 4 per cent return on capital according to the separation convention should be abolished in view of the fact that the Railway have to undertake responsibility for debt servicing and repayment of interest on loan.

10·3 ROADS AND ROAD TRANSPORT

10.3.1 Introduction

Roads and Road Transport play a very crucial role in rapid economic growth of a country. Road transport is particularly suitable for short haul traffic and for some specified types of goods, such as perishables and high valued commodities, because of its flexibility, shorter transit time, lower loss or damage during transit and consequent reduction in costs.

Statistics on roads and road transport are thoroughly inadequate and almost non-existent. As a result it is difficult to estimate the overall capacity of roads and road transport industry or the extent of services currently supplied by the industry. Survey has already been undertaken by the Bangladesh transport survey team on a priority basis to remedy this serious information deficiency.

During the First Five-Year Plan period, with the attainment of self-sufficiency in food and planned development of other sectors, the subsistance type economy of Bangladesh will rapidly move towards market economy and structural change from agriculture to manufacturing is also inevitable. These changes would naturally generate greater demand for transport and here road transport has to cater for its share of traffic. Besides its contribution to the arterial movement, road transport has to play a very significant role in providing transport services on short hauls covering routes leading to rail and river heads and trunk roads.

10.3.2 Roads and Highways

A. *Effects of the War*

Development of roads and highways had been very slow during the last 25 years. Again whatever was developed, was very badly damaged during the liberation war. Out of 4,656 bridges and culverts measuring about 200,000 rft. scattered over available 2,500 miles of

paved and 1,500 miles of fair weather road system, as many as 274 bridges and culverts measuring 21,569 rft. were destroyed during the liberation war. A large number of ferries were also sunk or destroyed.

Through Reconstruction and Rehabilitation Programme and with international assistance, all the roads and highways have now been opened to traffic. Most of the smaller bridges have already been reconstructed. At another 67 places, Bailey bridging of 2,600 rft. have been provided while 5 major road gaps where temporary ferry services have been provided, will continue for some time.

B. *Strategies and Priorities*

Although highways would continue to be one of the most essential modes of transportation for years to come all essential road schemes could not be included due to resource constraint. The First Five-Year Plan Programme for this sub-sector has, therefore, been prepared on the basis of the following guidelines, strategies and priorities:—

(i) Completion on a priority basis of all on-going schemes as rapidly as possible to ensure that full benefits of past investment are secured. This is subject to a critical examination of all schemes with a view to discontinuing or reducing the scope of those which are not economically justified (particular scrutiny being paid to those in which little investment has already been made).

(ii) Construction of bridges at all possible unbridged gaps—bearing in mind that in the majority of cases investment in improved ferry facilities and services will involve a lesser financial commitment and give a higher return. Bridges and major bridges in particular would, however, be constructed only when engineering and economic feasibility of such constructions have been established.

(iii) Completion of all important on-going infra-structure schemes.

(iv) Improvement of ferries at important river crossings.

(v) Upgrading of important roads and brioges, *i.e.*, improvement of the standard of maintenance and upgrading and rehabilitation of existing roads and bridges where these are clearly inadequate on structural or capacity grounds.

(vi) Partial completion of new infra-structure schemes.

C. *New Institutional and Organisational Framework for Roads and Highways*

Under the existing system, the major transport agencies are involved even in the provision of transport facilities that essentially serve the social needs of small localities; this notably applies to Roads and Highways Directorate and Inland Water Transport Authority and in some cases to Railway also. But to enable these agencies to concentrate on their functions in the arterial field which concerns the whole nation, and to give the local groups greater freedom of choice of investment in their areas, an attempt would be made from the beginning of the First Plan, to involve the newly elected local representatives of the people in decision-making process, thereby removing the major agencies from direct involvement at this level of the transport system. The involvement of major transport agencies might, for example, be limited to the provision of consultancy and supervisory services to the local authorities.

The technical, financial and physical implications of the above thinking are being studied. It is proposed that the responsibility of the roads falling under the following categories would be handed over to the local authorities and as such no allocation has been provided for these roads under Roads and Highways Sub-Sector:

(a) Construction of roads to connect :—

(i) Subdivisional headquarter with district headquarter.

(ii) Important trade and industrial centres.

(iii) Inaccessible and special areas.

(b) Construction of new roads of local importance including some of the less important on-going road schemes dropped from the list of Roads and Highways Directorate.

For construction of roads under the above category the following arrangement is proposed:

(i) District authorities will prepare a road building programme for roads under the above categories.

(ii) This programme will be presented to the Ministry of Communications for evaluation in relation to its technical feasibility and in relation to the national highway network.

(iii) An agreed priority list for the District will be developed by a Committee involving:

1. Ministry of Communications.
2. Ministry of Local Government (including newly proposed Physical Planning Division).
3. Ministry of Rural Development.
4. Ministry of Irrigation and Flood Control.
5. Head of the Zilla Parishad whose programme is under scrutiny.

(iv) Every year an allocation for the above road building programme based on an agreed formula will be made to each District under the Works Programme Section of the ADP.

(v) This allocation will be provided for the express purpose of procuring material inputs such as cement, steel, coal for brick burning, stone and bitumen required for the road building programme for that year.

(vi) District authorities will be expected to provide land and labour required for the programme. This may be done either by mobilising voluntary labour and donations of land or by raising resources locally to procure all or part of their local contribution of land and labour.

(vii) Roads selected by the District for execution during a financial year should be submitted in advance to the Roads and Highways Directorate for providing technical designs and specification including soil testing.

(viii) The roads so designed by the Roads and Highways Directorate will in the first instance be constructed under the supervision of Roads and Highways Directorate engineers.

(ix) It is expected however that all District authorities will require a permanent staff of engineers who will be sufficient and capable to supervise their roads building programme.

(x) The District authorities will be responsible from the outset in engaging sufficient overseers on their staff to direct the road building programme.

(xi) For the Five-Year Plan period a sum of Tk. 25 crores is budgeted under the Works Programme for financing the material inputs required under the programme. This means that local authorities will have to generate counterpart resources roughly amounting to Tk. 25 crores in cash or non-monetised forms to enable the total programme of Tk. 50 crores to go ahead.

Under the new concept, Roads and Highways Directorate would be solely responsible for roads and highways which consist mainly of—

(a) Roads and bridges which form the basic arterial or trunk system,

(b) Road links connecting adjacent districts,

(c) Road links of strategic and socio-economic importance.

D. *Plan Allocations*

A sum of Tk. 103 crore 84 lakh and 90 thousand with FEC of Tk. 35 crore 84 lakh and 70 thousand has been provided to the Roads and Highways Directorate for the execution of responsibilities entrusted to it. Major programmes included in the Plan are:

Completion of two foreign aided road schemes, *viz*, Dacca-Aricha highway and Dacca-Chittagong-*cum*-Narayanganj highway, besides completion of another 20 on-going road schemes, upgrading of 5 important on-going roads and completion of 8 on-going bridge schemes. Remaining work of Dacca Road Research Laboratory and installation of weigh bridges at several places would also be completed. Among the new schemes—bridging will be provided at 4 different road gaps and ferry services would be modernised at 20 major river crossings. In addition, provision has been made for upgrading of roads and bridges at several places and for establishment of 4 regional laboratories and workshops.

The total road building programme will, therefore, involve an estimated investment of Taka 154 crores, including both Road and Highway roads and District roads.

10·3·3 Road Transport

A. *Present Position*

The vast majority of road transport services are provided by privately owned vehicles. And in most cases those vehicles are owned by individuals who operate these vehicles with a viewto maximising profit without having any regard to the quality of the services. Government's participation in this field has been through the BRTC alone whose aim was to supplement private efforts as well as to set up a minimum standard of comfort, safety and reliability.

The War of Liberation has given a serious blow to the road transport sub-sector. About 4,244 trucks and 1,952 buses including a fleet of 33 buses belonging to BRTC were damaged. In addition, a large number of the bus and truck fleet have been rendered temporarily ineffective due to non-availability of spares. Except in the cases of buses and trucks, it was not even possible to estimate within an acceptable degree of error the extent of loss and damages caused to other types of road vehicles such as auto-rickshaw, taxi, cycle-rickshaw, bullock cart, thela, tonga, etc.

Meanwhile, it is clear that a substantial proportion of the capacity lost during the War of Liberation has already been or will have been made good by the beginning of the First Plan period. A large number of vehicles have already been received under international aid or grant arrangements. Others have been imported in CKD form and are being assembled in Chittagong by Pragoti Industries. Position of the fleet at the beginning of the period is given in Table X-10

TABLE X-10

Road Vehicles Statistics (As on 30-5-1973)

Type of vehicles	Available on 30-6-1973 (Nos)
Truck	11,100
Bus	7,200
Auto-rickshaw	6,536

B. *Future Requirements*

Regarding future requirements of road transports, in the absence of adequate road transport statistics, it became terribly difficult to estimate future demand. Based on preliminary studies, the estimates of the requirement of commercial vehicles (buses and trucks) during the Plan period is presented in Table X-11.

TABLE X-11.

Requirement of Commercial Vehicles (Buses and Trucks) during the Plan Period

Year	Bus			Trucks		
	Replacement	Expansion	Total	Replacement	Expansion	Total
1973-74	139	566	705	419	698	1,117
1974-75	259	566	825	551	698	1,249
1975-76	225	566	791	291	698	989
1976-77	365	566	931	551	698	1,249
1977-78	322	566	888	313	698	1,011
Total ..	1,310	2,830	4,140	2,185	3,490	5,675
				1,610**	2,440**	4,050**

**(In view of increased carrying capacity of each new truck (say present capacity 6-7 tons per truck as against previous capacity of 3-5 tons per truck) the required absolute number of new trucks would be about 30% less i. e. about 4050 new trucks instead of 5675 old trucks. Similarly 1610 trucks instead of 2185 and 2440 instead of 3490 trucks will be needed respectively for replacement & expansion.

With the acquisition of additional 2,830 buses, 2,440 trucks and 3,491 auto-rickshaws over the Plan period, increase in carrying capacity in terms of tons and passenger miles would be as follows:

TABLE X-12.

Estimated Carrying Capacity Over the Plan Period

(In lakh)

Types of vehicle.	1973-74.		1977-78.	
	Passenger miles	Ton miles	Passenger miles	Ton miles
Buses	90,000·00	..	1,60,480·00	..
Trucks	..	9,150·00	..	12,170·00
Auto-rickshaws	5,090·00	..	7,800·00	..

C. *Measures to Improve Road Transport.*

In order to ensure that road transport plays its full part in the economic development of the country, measures will be taken to ensure that before any new acquisition, maximum use is made of the existing vehicle fleet. In the case of new acquisition, all vehicles would be imported in CKD condition and then assembled in Chittagong by Pragoti Industries which has adequate capacity to meet the requirments for trucks, buses and cars throughout the Plan period. In view of this fact, no provision has been made for the foreign exchange component of the cost and the entire cost of buses and trucks has been shown in local currency.

In order to graduate from mere assembly operations Pragoti Industry will have to aim for progressive manufacture of its components. To this end ancilliary industries for the manufacture of components and spares will also be set up. This will lead to a gradually increasing availability of domestic manufactured parts for trucks, buses and other types of road transport vehicles. Concentration upon locally assembled vehicles will be assisted by standardisation of a small number of models (say 2 to 3 models). Standardisation will gradually lead to economy in import and supply of spare parts and will also lead to more efficient manufacture and repair.

Provision of an adequate supply of spare parts to ensure that all vehicles are available for full utilization is already a priority of the Government and it is anticipated that by the beginning of the Plan period, the number of vehicles off the road and awaiting maintenance and repair will have been reduced to normal proportions.

In view of the Government's commitment to socialism, a cheap and efficient public road transport system will be necessary. The publicly owned BRTC would thus have to be strengthened substantially. It's passenger fleet will be expanded from 776 bus and coaches

to 2,260 at the end of the Plan. Adequate workshop and maintenance facilities will, however, have to be provided to BRTC which has so far demonstrated a poor capability for maintenance resulting in a large proportion of their fleet being off the road. At the same time BRTC will need to provide efficient and economic road transport services designed to ensure its commercial viability. Provision of adequate facilities, skilled manpower and an improved organisational framework with first class management is particularly important given the expanded role assigned to the public sector in future. BRTC bus services will be augmented by the private sector whose fleet will be expanded from 6,424 units to 7,770 units.

A new Truck Division under BRTC has been established with an initial fleet of 1,000 trucks out of the trucks received as grant from India and other friendly countries through UNROB. During the Plan another 1,350 trucks will be added to this fleet. This will be the first commercial venture by the public sector in the field of trucking which has been hitherto dominated by private operators. The objective is to provide a bridge head in a private enterprise preserve, whilst keeping competitive pressure on the Private Sector not to charge excessive freights. At the same time public sector agencies will have ready access to a public sector service at competitive rates. To realise this objective commercial autonomy and efficient operation are essential. Since this is virgin territory for the public sector, management expertise has been imported in the short run whilst our own operatives acquire experience in running a modern trucking fleet.

As already mentioned earlier, besides buses and trucks, there are several other types of vehicles which form an integral part of the overall road transport system and cater for a large number of passenger and cargo movement particularly on short-hauls. Some of these vehicles are not mechanised such as thela, bullock carts, tonga, cycle-rickshaw, etc. In addition, private vehicles such as cars, motor cycles, pedal cycles, also cater for a large amount of passenger movement.

The future requirements of both mechanised and non-mechanised road transport (excluding buses and trucks for which estimate has already been prepared) would depend largely on the overall economic development of the country, policies being adopted regarding the development of other competing forms of road transport and emphasis being laid on the development of feeder system, particularly in rural areas. As it stands pedicabs and auto-rickshaws are a standard form of public transport for low income groups along with the buses. In view of this fact, based on preliminary studies, adequate provision has been made for addition and replacement requirements of these vehicles in the private sector. Private operatives may be expected to manufacture from local resources as many pedicabs as the market will sustain. However, provision will have to be made to import auto-rickshaws in CKD condition for local assembly and progressive manufacture. The Bangladesh Engineering and Shipbuilding Corporation, in fact, aims, under licence from a leading foreign manufacturer, at setting up a capacity to produce three wheelers during the Plan period.

In the field of road transport some provision will have to be made for some private ownership of the means of transport. Here our social policies must put maximum emphasis on meeting the needs of lower income groups. To this end bye-cycle manufacturing capacity is being substantially augmented from a benchmark capacity of 47,000 to 2,20,000 during the Plan period. For slightly higher income groups motor cycles will be produced

from the publicly owned Atlas Honda company under the BESC. This has a capacity of 6,000 units per year but will need to balance its capacity to graduate from assembly of imported CKD to progressive manufacture.

Some amount of cars will have to be produced during the Plan period. This will be primarily designed for commercial services either through the Tourist Corporation's taxi fleet or even for normal taxi services in urban centres. Some provision will however be made for Government's own requirements. As a residual measure, if resources so permit, some cars may be available for private purchase but priced to reflect its scarcity value. Pragoti Industries after meeting the need for trucks and buses to the extent of 1,638 units a year will have enough capacity to cater to this need. It is proposed to programme their annual capacity of 6 000 units of bus/trucks and 2,000 units of Car/Jeep type vehicles as follows:

	Bus.	Trucks.	Cars/Jeeps.
Annual requirement (Nos) ..	828	810	270

D. *Plan Allocations*

A sum of Taka 41 crore and 2 lakh with FEC of Tk. 1 crore 38 lakh has been provided for the development of road transport in the public sector and a further provision of Taka 63 crore 66 lakh and 20 thousand without any foreign exchange component exists for the development of road transport in the private sector, which is detailed below:

TABLE X-13

Summary of the Plan Provisions for Road Transport.

(*Taka in crore*)

Serial No.	Type of vehicles/schemes.	Total.	F.E.C.
		Taka.	Taka.
Public Sector:			
1	Buses (2,250 Nos.)	22·500	..
2.	Maintenance, Training and other facilities for Bus Division of BRTC	5·850	0·940
3	Trucks (1,350 Nos.)	11·610	..
4.	Workshop and drivers' training school for Truck Division of BRTC	1·060	0·440
	Sub-Total	41·020	1·380
Private Sector :			
1	Buses (1,890 Nos.)	18·900	..
2	Trucks (2,700 Nos.)	23·220	..
3	Auto-rickshaws	7·442	..
4	Taxis	1·450	..
5	Pedal rickshaws	2·200	..
6	Thelas	0·050	..
7	Bullock carts	1·250	..
8	Private cars	4·500	..
9	Motor cycles and pedal cycles	4·600	..
	Sub-Total	63·662	..
	Total for Public and Private Sector	104·682	1·380

E. *Policy Recommendation for Road and Road Transport*

For effective implementation of the First Plan targets of road transport sub-sector, following policies shall have to be adopted:

I. Strengthening of the administration, organisation, and technical capacity of the R & H Department both centrally and at regional and district level; completion of the Road Research Laboratories and adequate staffing is a particular priority.

II. A strategy to be adopted for the present and future in concentrating resources on a smaller number of schemes to ensure that those which are economically justified are only taken up and completed quickly instead of distributing limited resources on too many schemes at a time.

III. Road and road transport statistics in the country are absolutely inadequate. Some system would, therefore, be evolved to ensure regular collection and maintenance of statistics. Transport Survey Group under the Planning Commission would be made responsible, among others, for the collection and maintenance of these statistics on a continuous basis. In addition, organisation in the ministries and agencies would be set up/strengthened for collection and maintenance of these statistics.

IV. Notwithstanding the expanded role of the public sector, the private sector will continue to provide major road transport services. In order to ensure that these services are provided safely and economically in the public interest, the system of regulation of the industry will need to be thoroughly overhauled and the Motor Vehicles Act brought up-to-date. Pending the recommendations of the Transport Survey in this respect, a start will be made by carrying out the recommendation of the Road Transport Enquiry Committee set up by the erstwhile Government of East Pakistan in 1970.

V. Government policy would be to initiate formation of bus and truck co-operatives in the private sector within a stipulated period of time. No fresh permits would be given to the individuals for acquisition of buses or trucks. Eventually these co-operatives would be owners of all new buses and trucks. Attempts would be made to give licence for import of spares only to the co-operatives and this would also encourage formation of co-operatives.

VI. This same principle must be extended to pedicabs and auto-rickshaws. Here Government policy must be guided by the slogan "Ownership to the pullers/drivers". Both rickshaw pullers and auto-rickshaw drivers are an exploited community working long hours at the cost of their health and life and generating only a small surplus to meet their subsistence. At the same time the surplus extracted by the owners is partly paid for by the public in higher fares.

VII. To end exploitation and reduce fares to the common man it is aimed to vest ownerships in pullers/drivers co-operatives. A first step has already been taken where 1,900 out of 2,000 auto-rickshaws imported during 1972-73 have been handed over to Auto-rickshaw drivers co-operatives. These will buy the vehicles from TCB through a loan from the commercial bank and seek to sell them to their members through a system of hire-purchase. An even more advanced form of co-opera-

tive is being tried out on an experimental basis with 100 auto-rickshaws where ownerships will remain with the co-operative which will serve 150 drivers who will share the profits from the venture. Both co-operatives will be used to take up new units coming on the road and eventually we may aim at making the drivers of todays privately owned autos into owners through co-operatives. The same principle must be extended to the even more suppressed pedicab pullers over the Plan and an increasing number of pullers must be made owners.

VIII. The capacity of the assembly plant, Pragoti Industries would be fully utilised. As the capacity of the Pragoti Industries is adequate to meet the requirement of the country for the next few years, buses and trucks would be imported in CKD condition only and the same policy would be adopted in the acquisition of other road vehicles where assembly capacity exists within the country.

10·4 INLAND WATER TRANSPORT

10·4·1 Inland Water Transport Authority (IWTA)

Waterways in Bangladesh being abundant, the strategy here would be to improve the conservancy of this national asset and thus provide the foundation for more efficient utilisation of the country's coastal and inland waterways fleet. The importance of inland waterways in the national economy has been strikingly emphasized both during the War of Liberation and the post-liberation period, since inland water transport became the backbone of movement at a time when both railway and highways were in a state of disarray from war damage.

Whilst waterways require less infra-structure investment for any given volume of traffic than railway or highways, they nevertheless require constant attention to dredging, and the installation and maintenance of river training works, marks, bouys and other navigational aids to ensure the safe movement of craft at all seasons of the year. In addition, port facilities have to be provided to keep pace with the expansion of trade. The Plan provision, therefore, provides for some expansion and improvement of the system of navigational channels and of inland ports.

Major programmes, some still tentative, that are included in the Plan are—(a) completion and opening of Mongla-Ghasiakhali canal—shortening the riverine distance from Mongla Anchorage to Chandpur and above for vessels of deep draught, (b) development of about 500 miles of waterways, (c) survey and conservancy of about 1,000 miles of waterways, (d) provision for increased number of discharge points at the major inland river ports along with efficient loading and unloading facilities including construction of some transit sheds, (e) development of some new inland ports, (f) mechanisation of about 1,500 country boats including construction of some ferro-cement boats/pontoons based on the results of the pilot project which has already been taken in hand., (g) procurement of 10 dredgers, (h) aids to navigation and training of IWT personnel. In additon, provision has been made for undertaking comprehensive feasibility studies for the development of waterways, inland ports, etc., at several places. In all, a sum of Taka 48 crore 2 lakh and 50 thousand with FEC of Taka 17 crore 99 lakh and 10 thousand has been provided for the programmes under IWTA. Of this, about Taka 21 crore 76 lakh and 50 thousand with FEC Taka 11 crore 14 lakh and 10 thousand is provided for the completion of on-going schemes only.

A detailed study is required to identify dead and dying rivers in Bangladesh whose resuscitation is economically justified. Such a study must examine not just the costs and benefits of investment in this field in relation to alternative investments in the transport sector but must examine each river identified for resuscitation in relation to its impact on irrigation, flood control and ecology. It will have to be further investigated whether rivers so identified can be resuscitated by the expanded dredging fleet to be acquired during the next five years or whether a special task force would be in order.

Some provision has been made for development of new inland ports. In this connection it may be borne in mind that the traffic pattern after liberation has undergone a substantial change as compared to that which obtained during the preliberation period due to development of new trade relationship with India. Traffic pattern may further change on provision of permanent port facilities at Chalna or at some other place and as a result of the realisation of the industrial programme as set forth in the First Plan. Actual development of new inland ports will, therefore, have to be undertaken after completion of the study currently undertaken by the Economist Intelligence Unit (EIU).

10.4.2 Inland Water Transport Corporation (IWTC)

A. Present Position and War Damages

Prior to the War of Liberation almost the entire fleet of IWT vessels were in the private sector operated individually as well as by formation of companies. This resulted in more of profit making than improving the quality of service. With a view to improving this situation, the Government has formed the Bangladesh Inland Water Transport Corporation (BIWTC), incorporating all the former major companies. As a result about 50 per cent of the total cargo capacity and 15 per cent of the passenger capacity has been brought under Government control and further acquisition may be made during the Plan period.

During the War of Liberation, a large number of IWT vessels of different types were damaged. A list is given below:

IWT Public Sector.		IWT Private Sector.	
Ferry	8	Passenger launch ..	113
L. C. T.	2	Coaster	7
Passenger vessel	4	Oil Tanker	4
Oil tanker	1	Barge	18
Tug	5	Flat	2
Flat/Barge ..	11	Tug	6
Pontoon	1	Self propelled cargo launch	16
Sub-total	32	Sub-total ..	166

Loss of bay crossing capacity has already been made up through acquisition of coasters and self-propelled barges as relief grant. Similarly 4 tankers have also been received as relief grant and six more are expected to be acquired during the current year under the Reconstruction and Rehabilitation programme. The major loss yet to be made up is in the private sector in passenger carrying capacity.

Even after the Government decision of diverting more and more of imported bulk cargo from Chittagong to Chalna, the IWT traffic is not likely to increase much particularly because the overall import of food grains would be gradually decreasing with the planned attainment of self-sufficiency in food. The preliminary traffic allocation shown in table X—4 would reveal this fact.

B. Strategy.

The strategy for the IWT sub-sector would, therefore, be to aim for an improvement of overall vessel usage during the Plan period of some 20-30 per cent without any considerable expenditure and purely by more intensive use of the fleet, terminal and repair facilities and better use of personnel.

To achieve rapid improvement in the efficiency and utilisation of the country's large inland transport fleet, efforts would be concentrated on the following:

1. Reduction of turn-round of vessels at terminals;
2. Improvements in transit time between points;
3. Co-ordination of operations within the IWT sector and between it and other modes;
4. Removal of existing delay at vessel repair yards;
5. Improved navigational aids on major river routes, which is covered by the IWTA's five year plan programme.

Keeping in view the above startegy, investment programme for the I.W.T.C. and private sector is rather modest, consisting essentially of replacement of lost, damaged and overaged vessels to bring the fleet up to its present static capacity in up-to-date tonnage, capable of carrying an increased volume of traffic both on existing routes and certain new routes proposed to be developed. A special policy with regard to the private sector will be to organise it on a co-operative basis.

C. Major Programmes.

Major programmes included in the Plan are:

Acquisition of 5 oil tankers of 1000 tons capacity each, 70 inland barges with 12 inland tugs, 30 shallow draft barges with 5 shallow draft tugs, 6 passenger vessels, 5 ferries and 3 floating cranes for public sector (I.W.T.C.). For private sector, major programme included acquisition of 113 passanger launches and 16 self-propelled cargo launches.

With the addition of above vessels to the existing fleet strength of both public and private sector, carrying capacity would increases as follows:

(*In lakh*)

Type of vessels.	1973-74		1977-78	
	Passenger miles.	Ton miles.	Passenger miles.	Ton-miles.
IWT Passenger vessels	5180·00	..	6807·00	..
IWT Cargo-vessels	..	3740·00	..	5280·00

Financial allocations made for the above programme are as follows:

(Taka in crore)

	Total.	F.E.C.
(a) IWT Public Sector	18·220	8·739
(b) IWT private Sector	2·740	1·700
Total ..	20·960	10·439

D. Policy Recommendation for IWT Sub-sector

I. Private operators in IWT sub-sector would be organised on a co-operative basis. No individual would be allowed to own a vessel. To start with, co-operatives would be formed with the existing operators for operation and management and these will gradually take over ownership within a stipulated period. Attempts would be made to allow imports of spares and accessories through the co-operatives alone.

II. Existing regulatory act in regard to movement and control of IWT vessels would be amended to reflect the present day requirements.

III. A large number of taxes and tolls are levied on IWT. These would be rationalised in line with other competing modes of transport.

IV. Various types of IWT vessels are in operation in Bangladesh. A large number of them do not conform to the minimum standard of safety and comfort. In order to ensure standardisation of all IWT vessels designs and specifications of all vessels to be constructed in the country or outside shall have to be approved by the design centre proposed to be located in the IWTA.

V. Existing dockyards and boat building yards would be modernised and expanded if necessary to meet the entire boat building requirement of the country.

VI. In order to make the IWTC an efficient and commercially viable organisation it will need to be given maximum autonomy in its operations whilst it will remain subject to overall control of the Ministry in policy matters.

VII. A proper incentive system should be developed to relate the reward structure to performence at all levels from senior managers to workers.

VIII. In order to ensure its commercial viability its entire tariff structure will need to be reappraised in the light of post-liberation changes in the pattern of traffic and costs.

IX. The component units of IWTC must be immediately integrated into a single fleet with a unified labour force responsible to a single administrative authority.

10·5 PORTS

10·5·1 Present position and war damages

Ports being the "gateways" of a country their development needs to be geared to both external and internal transportation developments. Resources spent on shipping for external transportation and on railways, highways and waterways for inland transportation will not be optimally utilised if ports are not developed simultaneously.

Both Chittagong and Chalna Ports suffered severely during the War of Liberation, having their entrance channels and fairways obstructed by sunken ships, with consequent restrictions upon navigation. In addition, Chittagong suffered further war damage to fixed installations—jetties, transit sheds, warehouses—as well as to other port equipments afloat and ashore. Salvage work at Chittagong has removed the principal wrecks already, and navigation is now restored to its pre-war standard. At Chalna, a programme of salvage of the principal wrecks is well underway, for completion by the onset of the 1973 monsoon. Chittagong may be regarded as having been substantially recommissioned to the point of handling a monthly average of 3·12 lakh tons of dry cargo during July-December, 1972 compared to a monthly average of 2·86 lakh tons of dry cargo during 1969-70. This has been achieved in spite of extreme congestion in the face of abnormal relief foodgrains imports because of logistic support provided by the U. N. Many of the jetties and supporting installations remain however sub-standard as to design and state of repair, and there is an urgent need both for rehabilitation, rebuilding and fresh construction to bring the port facilities up to modern standards capable of a consistently high rate of throughput of cargo.

Traffic through the ports has been increasing at a rapid rate in recent years. But with the planned attainment of self sufficiency in food within the First Plan period, the sea-borne traffic (both dry and oil) of Bangladesh is estimated to increase only a little from 77·8 lakh tons in 1973 to 95·2 lakh tons in 1978.

Till recently traffic through both Chittagong and Chalna has been imbalanced with marked excess of imports over export traffic at Chittagong and the reverse at Chalna. The ratio for 1969-70 was 4:1 for imports and 1:1·75 for exports. Attempts would therefore, be made to reduce this imbalance and thus enable the inland transport links with the two ports to be used more efficiently, with beneficial effects upon shipping also.

In view of the situation outlined above, the Plan for the sea ports provides for expansion and improvement of port facilities to cater for the sea-borne traffic projected under other sectors of the Plan, but related to changed pattern of internal movement.

10.5.2 Chittagong Port.

On the basis of a preliminary allocation of forecasted traffic to mode and port on a least cost basis, it is calculated that 25 lakh tons of general cargo (imports and exports combined), would pass over general cargo berths at Chittagong in 1973-74 raising to 33 lakh tons in 1977-78. If these projections materialise, Chittagong Port will be heavily overloaded from the beginning since the port does not have the full use of all its existing berths. The reconstruction of berths Nos. 1 to 6 is in hand, but the last one will not be handed back to the port for use until the end of 1974; whilst Nos. 14 to 17 are sub-standard berths which also require reconstruction or replacement; work on these cannot be started until berths 1 to 6 are back in service. At an average throughput of 190,000 tons per berth per annum, Chittagong port needs 13 general cargo berths in 1973 and just over 17 in 1977-78 for the tonnage forecasted.

In view of the above requirements, provision is made for reconstruction of berths 1—6 as early as possible concurrent with the construction of two new general cargo berths immediately up stream of berth No. 14. As and when jetties 1—6 are commissioned

reconstruction of two out of the four sub-standard berths in the group 14—17, can be put underway for completion in the First Five Year Plan. The other two jetties, if still needed, may be taken up in the Second Plan.

To realise the assumption of 190,000 tons of cargo to be cleared per jetty an improvement in the efficiency of handling operations at the port will be called for. During the Plan period this will require investment to improve facilities in the way of construction of transit sheds and warehouses, improvement of stacking yards and roads as well as installation of further mechanical equipment ashore. Completion of workshop and slipway projects will be needed to service the small port fleet. Provision of additional floating equipments and conservation measures will also be needed.

The off-shore oil terminal under the Chittagoug Port Trust which has now been out of commission since 30th April 1970 will need to be restored within 1973 if the current drainage of foreign exchange in lighterage is not to continue. A new off-shore oil terminal may need to be constructed to handle even larger tankers. This may be covered by the programme of the Oil and Gas Corporation which may, as the sole customer be given control of these facilities.

A financial provision of Taka 37 crore 60 lakh and 30 thousand with FEC of Taka 19 crore 37 lakh and 10 thousand is made for the development of Chittagong port, of which Taka 24 crore 90 lakh and 30 thousand with FEC of Taka 12 crore 27 lakh and 10 thousand is provided for on-going schemes.

10.5.3 Chalna Anchorage/Port

For many years there has been a plan for the building of a permanent port at Mongla, with rail and road connections to the interior in partial replacement of the Chalna Anchorage, and work actually started on the construction of deep water quays before the War of Liberation. The question of the extent to which this work should be resumed, in the light of changes which have taken place in the overseas trade of Bangladesh and in the types of ships to be handled, is under active consideration to determine whether the construction at Mongla should go ahead within the Plan period, and if so what the optimum size of the project should be.

Since the total tonnage that it is calculated should be handled at Chalna at the end of the Plan period (23 lakh tons) does not differ greatly from that at the beginning (owing to the projected reduction of massive foodgrain imports), based on preliminary studies, it has been decided to go ahead with the construction of 3 general purpose berths at Chalna along with warehousing and cargo handling facilities. Plan provision, however, exists for the construction of a full-fledged permanent port at Chalna, but no expenditure would be incurred beyond the construction of 3 general purpose berths, till the results of a comprehensive study having the following scope is completed:

> "In view of the changes which have taken place in the overseas trade of Bangladesh and in the types of ships to be handled, a comprehensive study would be undertaken to see the need for, and means of, providing facilities for handling large ships in Bangladesh notably bulk handling facilities in sheltered waters south of Chittagong for super-tankers (say up to 100,000 tons) and other deep-draft bulk carriers, for which facilities cannot be provided at either Chittagong or Chalna even with extensive dredging".

The EIU consultants of the Bangladesh Transport Survey are expected to cover the economic aspect of the above study. Further studies on technical aspect will also continue simultaneously. The results of these investigations will shed much light upon the desirable direction and extent of further development of both Chittagong and Chalna, thus enabling current plans for both ports to be confirmed, modified or extended during the currency of the First Plan period.

Besides the construction of permanent berths, other major programmes included in the Plan are: deepening of approach channel to increase the draught from 26′ to 32′, improvement of navigational aids to enable day and night movement of ships and replacement of harbour crafts.

A provision of Taka 41 crore 68 lakh and 60 thousand with FEC of Taka 22 crore 41 lakh and 5 thousand has been made for the Chalna Port of which about Taka 32 crore 2 lakh and 10 thousand with FEC of Taka 15 crore has been allocated for the only on-going scheme "Permanent port at Passur".

10·6 SHIPPING

10.6.1 Bangladesh Shipping Corporation

A. *General Background*

Prior to liberation, Bangladesh had no independent shipping line of its own- neither in the Public Sector nor in the Private Sector. National Shipping Corporation, a Public Sector Corporation of Pakistan had 32 ships out of a total fleet of 72. These were all forcibly retained by Pakistan at liberation. Bangladesh was, therefore, left with no ships after the War of Liberation.

In 1972, the Government set up the Bangladesh Shipping Corporation to perform, amongst others, the following functions:

(a) To provide safe and efficient shipping services on international routes.

(b) To acquire, charter, hold or dispose of ships or crafts.

The need for Bangladesh to have a fleet of ocean-going ships under its ownership and control is three-fold: to be independent of foreign flag vessels in times of international difficulty and as an insurance against adverse movements of freight rates; to save foreign exchange by carrying a reasonable proportion of the country's imports and exports and to give employment to Bangladesh nationals in a vocation for which their skills are world famous.

Plans have already been made for Bangladesh to enter some of the traditional cargo liner trades, starting with the Bangladesh-U.K.—Continent, the most important, to be followed by Bangladesh—North America, with gradual expansion to other routes. Bangladesh Shipping Corporation has already achieved membership of the Bangladesh-United Kingdom/Continent Conferences, with entitlement to carry 40 per cent of Bangladesh overseas traffic in those trade routes in its own tonnage, owned or chartered.

Projections of the actual trade between Bangladesh and U.K. and Bangladesh and the European Continent before the War of Liberation, related to the Bangladesh entitlement under the Conference system, indicates a requirement of 12 ocean-going ships for these trades, whilst the projection for the U.S. East coast trades is 6 vessels. The size of the fleet

required to carry 50 per cent of Bangladesh's overseas trade on the major shipping routes by 1980—an ultimate target is approximately 40 ships in total, based on the immediate pre-war pattern of trade and types of ships.

The immediate plans provide for a mixed policy of chartering (both voyage and time charter), purchasing second hand and building new ships. The objective is two-fold: to take advantage of market trends by purchasing wherever possible on what is at present a rising market, and at the same time to limit the expenditure of foreign exchange in the general interest—not because such expenditure will not produce direct savings in current outgoings in freight paid to foreign carrier, but because of the constraints which shortage of foreign exchange impose on all sectors of the economy.

B. *Shipping Programmes*

Taking these factors into consideration provision has been made for acquisition of 20 ocean-going cargo vessels and some workshop and training facilities. The ratio between new and second hand vessels will be decided by the Ministry of Shipping keeping in view the comparative advantages of each type of vessels. Additional provisions will need to be made for oil tankers for which external resources may have to be diverted or separately lined up. A provision for procurement of lighterage vessels in lieu of payments on current accounts for lighterage charges will also have to be made. Total Plan outlay is Taka 31 crore and 31 lakh having a F.E. Component of Taka. 31 crore 8 lakh and 50 thousand. This fleet of ships along with the existing ones could be able to handle approximately 5 lakh tons of imports and 4 lakh tons of exports.

10.6.2 Mercantile Marine Academy

The Mercantile Marine Academy was established by the then Government of Pakistan to train Nautical and Engineering officers. There is no provision for training of radio operators who used to be trained in Karachi of Pakistan. There is also no arrangement for holding examination of Mates and Masters for awarding certificate of competency for running the merchant fleet in the country. Consequently the candidates have to go to U.K. or India for such examinations and this means expenditure in foreign exchange. It is, therefore, essential to make necessary arrangements for holding such examinations. It is also necessary to provide facilities for training of seamen. Provision has, therefore, been made for these facilities. Total estimated cost is Taka 86 lakh with a F.E. Component of Taka 43 lakh.

10.6.3 Marcantile Marine Department

This department is responsible for providing navigational aids such as light houses, lighted buoys, etc, for international shipping. Provision has, therefore, been made for Sonadia island light house and south patches unmanned light float. Plan outlay for this purpose is Taka 20 lakh having a F.E. Component of Taka 18 lakh.

10.7 CIVIL AVIATION AND BANGLADESH BIMAN

The Civil Aviation Authority is responsible for providing airports and associated facilities and the Bangladesh Biman is responsible for management and operation of air transport services.

Growth of surface transport in Bangladesh is conditioned by its peculiar geography and terrain. The country is criss-crossed by numerous waterways and canals with high rain-fall which occasionally leads to flooding of the road and rail transport media. Viewed in this background, air transport can play a very significant role for quick movement of passengers and cargo, eliminating the irregularity of travel time due to geographical and climatic conditions.

In the past air transport services in the country did not develop following a careful study and planning of requirements. In fact the services were started on the physical infra-structure facilities which were available after the second world war. These facilities were not the result of careful planning and technical study nor were these built for civil/ commercial purposes.

Prior to liberation, Civil Aviation authorities and the airline were responsible mainly for catering to the demand for domestic traffic. The present Dacca Airport was never designed to be an international port and hence the airport authorities are facing difficulties arising out of the sudden increase of domestic and international traffic after liberation.

Before the liberation of the country, PIA used to meet the domestic air transport demand of Bangladesh with four F-27 and 3 Twin-Otter (STOL) aircrafts based in Dacca. On the domestic routes regular scheduled services were operated connecting Dacca with Chittagong, Jessore, Sylhet, Ishurdi, Comilla, Cox's Bazar and Shamsher Nagar. On the regional routes, regular flights were operated to link Dacca with Katmandu and Rangoon. Besides, scheduled Boeing services were operated by the PIA linking Dacca with China, the Far East, the Middle East and European countries.

Limited engineering facilities were available at Dacca for maintenance of F-27 and STOL aircrafts as major overhauls of air frames and engines used to be done in Karachi. Besides, the problems faced by Civil Aviation authorities and Bangladesh Biman have been compounded by shortage of adequately trained personnel.

During the War of Liberation all the aircrafts were removed to the then West Pakistan. Extensive damages were also caused to the runways, air communication facilities, hangers, buildings and other equipments and installations.

By now a substantial progress in reconstruction and rehabilitation of the damages has been made. All the runways have been made operational. Six F-27 aircrafts have been procured as grant as well as through purchase and air transport navigational facilities have been restored though not fully. Work on rehabilitation and reconstruction is expected to be completed by the end of 1973-74.

All statistical data as to traffic handled by the PIA and its operations used to be maintained in the PIA Head Office in Karachi. Therefore there are severe limitations in making any projection of passenger traffic during the Plan period. Projection of passenger traffic has, however, been made on the basis of 1970 figures. It has been assumed that up to the period 1975-76 there would be an annual increase of 15 per cent in passenger

traffic dropping to 10 per cent after that period. Projected passenger traffic during the first year and the last year of the Plan period has been shown in the following table:

(Figures in thousand)

	1973-74.	1977-78.
Domestic	589·00	11,69·00
Regional	34·00	107·00
International	30·00	84·00
Total ..	653·00	1,360·00

Investment programmes for Civil Aviation and Bangladesh Biman have been made keeping in view the above projection of traffic and the following objectives:

(i) to restore air transport facilities to all the existing air fields subject to commercial viability;

(ii) to provide adequate frequency to meet the traffic demand of the existing airport and to make suitable provisions for meeting the anticipated demand of the future traffic;

(iii) to construct airports where these are needed on the basis of traffic demand and provide air transport facilities;

(iv) to provide air services to regional as well as foreign countries with which Bangladesh has a significant community of interest and thereby earn and save foreign exchange;

(v) to provide modern and adequate air communication and terminal facilities;

(vi) to provide adequate training facilities for the personnel, of both the Civil Aviation and Bangladesh Biman; and

(vii) to complete construction of the International Airport at Kurmitola.

Major schemes included in the investment programme of the Civil Aviation are (a) completion of the international airport at Kurmitola, (b) completion and improvement of Barisal and Saidpur airports, (c) improvement and recarpetting of runways at Cox's Bazar, Ishurdi, Comilla, Sylhet and Tejgaon, (d) development and expansion of terminal facilities at Chittagong, (e) making the runway at Sylhet Jet capable. (f) establishment of training centre for Civil Aviation personnel at Dacca.

Financial implications of this programme are as follows:

(Taka in crore.)

	Total.	F. E.
On-going schemes	21·526	11·093
New schemes	9·710	3·841
Total ..	31·236	14·934
Reconstruction and Rehabilitation programme ..	2·000	1·056
Grand Total	33·236	15·990

Major schemes included in the investment programme for Bangladesh Biman are (a) establishment of ground training school, (b) purchase of two Jet aircrafts, (c) construction of two hangers and purchase of hanger equipments, handling equipments, motor vehicles, (d) construction of new flight kitchen, etc.

Financial implications of this programme are as follows:

(Taka in crore.)

	Total	F.E.
On-going schemes	1·579	0·967
New schemes	30·633	22·680
Grand Total ..	32·212	23·647

10.8 BANGLADESH TRANSPORT SURVEY

The present team of Economist Intelligence Unit (EIU) consultants started their work on the Bangladesh Transport Survey from November, 1972. The main objective of this transport survey is to formulate a co-ordinated short and long-term development programme for the transportation sector as a whole. To this end, the survey would provide:

(1) A detailed programme of transport investments for the period 1973-74- 1977-78, based on the economic priorities of specific projects;

(2) A perspective programme of transport investment for the following ten years;

(3) Recommendations for the improvements of the operation, planning, organisation, administration and management of each transport mode;

(4) Recommendations for the improvements of Government transport policies, specially policies for effective transport co-ordination;

(5) Identification of needs for and scope of further pre-investment studies;

(6) Training of Bangladesh counterparts during the survey and recommendations on the retention of advisers and on further training abroad of Bangladesh national in the field of transportation planning.

The final report of the transport survey is expected to be available by March/April, 1974 when the investment programme included in the Plan would be reviewed and modified wherever required.

The survey being a continuous process, the local counterpart portion of the transport survey group should continue their work even after the completion of the present survey. Besides other work, this group under the Planning Commission would be made responsible for collection, maintenance and analysis of transport statistics on a continuous basis. A Plan provision of Taka 20 lakh has, therefore, been made for this purpose.

Annexure IX/1.

BENCH MARK AND PHYSICAL TARGETS FOR FIRST FIVE YEAR PLAN (1973-78)

Transport Sector.

Sl. No.	Sub-sectors.	Units.	Bench-Mark position at the end of 1972-73.	Targets for the First Five year Plan (1973-78). Addition.	Replacement.	Total.	Position at the end of the Plan period: 1977-78*.	Percentage increase in 1977-78 over 1972-73.
1	2	3	4	5	6	7	8	9
1.	**Railways.**							
	(a) Diesel Locomotives	B.G. Nos.	30	..	20	20	30	0·00
		M.G. ,,	144	30	20	50	174	20·80
	(b) Steam Locomotives**	B.G. ,,	118	..	(—)15	(—)15	103	—12·70
		M.G. ,,	222	..	(—)25	(—)25	197	—11·30
	(c) Passenger Carriages and other Coaching vehicles.	B.G. ,,	408	60	100	160	468	14·70
		M.G. ,,	1,275	212	50	262	1,487	16·70
	(d) Wagons	B.G. ,,	4,367	700	600	1,300	5,067	16·00
		M.G. ,,	11,672	1,200	1,071	2,271	12,872	10·20
	(e) Route mileage	B.G. Miles	574	60	90	150	634	10·45
		M.G. ,,	1,202	40	..	40	1,242	3·33
2.	**Roads and Highways**							
	(a) High type roads	Miles	2,500	550	..	550	3,050	22·00
	(b) Low type roads	Miles	1,466	454	..	454	1,920	31·00
	(c) Bridges	Rft	205,644	58,634	..	58,634	2,64,278	28·50
3.	**Road Transport**							
	(a) Buses	Nos.	7,200	2,830	1,310	4,140	10,030	39·20
	(b) Trucks	Nos.	11,100	2,440	1,610	4,050	13,540	22·00
	(c) Auto-rickshaws	Nos.	6,536	3,491	3,951	7,442	10,027	53·50
4.	**Inland Water Transport Authority**							
	(a) Development of waterways (Perennial).	Miles	3,500	500	..	500	4,000	14·3
	(b) Development of secondary inland river ports.	Nos.	Nil	10	..	10	10	..
	(c) Launch landing stations ..	Nos.	150	115	..	115	265	76·66
	(d) Major ferry terminals ..	Nos.	5	2	..	2	7	40·00
	(e) Mechanization of country boats	Nos.	30	1,500	..	1,500	1,530	5,000·00
	(f) Hydrographic survey and inspection vessels.	Nos.	22	6	..	6	28	27·27
	(g) Oceanographic survey vessels	Nos.	Nil	1	..	1	1	..

*Indicates bench mark *plus* net addition during the Plan period.
**Negative sign indicates condemnation of steam locomotives.

Annexure IX/1—*(Contd.)*

BENCH MARK AND PHYSICAL TARGETS FOR FIRST FIVE YEAR PLAN (1973-78)

Transport Sector.

Sl. No.	Sub-sectors,	Units.	Bench-Mark position at the end of 1972-73.	Targets for the First Five-year plan (1973-78).			Position at the end of the plan period: 1977-78*.	Percentage increase in 1977-78 over 1972-73.
				Addition.	Replacement.	Total.		
1	2	3	4	5	6	7	8	9
	(h) High powered salvage unit ..	Nos.	Nil	1	..	1	1	..
	(i) Dredgers	Nos.	3	10	..	10	13	333·33
	(j) Training centre for Masters, Serangs and Deckhands for IWT in Bangladesh.	Nos.	Nil	1	..	1	1	..
5.	**Inland Water Transport Corporation**							
	(a) Oil tankers	Nos.	13	5	..	5	18	38·45
	(b) Inland barges/flats/Jute boats	Nos.	382	30	48	78	412	7·85
	(c) Inland tugs	Nos.	56	8	4	12	64	14·28
	(d) Shallow draft barges ..	Nos.	Nil	30	..	30	30	..
	(e) Shallow draft tugs ..	Nos.	Nil	5	..	5	5	..
	(f) Passenger vessels	Nos.	13	6	..	6	19	46·15
	(g) Ferries	Nos.	14	5	..	5	19	35·70
	(h) Floating cranes	Nos.	3	2	1	3	5	66·66
6.	**Ports**							
	(a) Chittagong Port	Nos. of Jetties.	17 Marginal* Jetties, (*i.e.* 11 standard jetties).	2 Jetties.	8 Jetties.	10 Jetties.	19 Marginal* Jetties. (*i.e.* 18 standard jetties).	18·20
	(b) Chalna Port	Do.	Nil	8 Jetties.		8 Jetties.	8 Jetties.	..
7.	**Shipping**							
	(a) Ocean going cargo vessels including coasters.	Nos.	7	20	..	20	27	285·75
8.	**Civil Aviation**							
	(a) Airports	Nos.	9	3	..	3	12	33·33
	(b) Civil Aviation training centre	Nos.	..	1	..	1	1	..
9.	**Bangladesh Biman**							
	(a) Aircrafts	Nos.	6	2-Jet aircraft. 2-Fokker	..	4	10	66·66
	(b) Aircraft hangers	Nos.	1	2	..	2	3	200·00

**Notes*—In the bench mark year, 7 jetties were standard jetties *i.e.* in good condition and the other 10 jetties were sub-standard. Out of these 10 jetties, 8 jetties are expected to be rehabilitated as standard jetties thereby raising the number of standard jetties to 15. To this number 2 more new jetties are being added thereby raising the number of standard jetties to 17 and total number to 19 because, even at that stage two jetties will remain sub-standard.

CHAPTER XI

POWER, NATURAL RESOURCES AND SCIENTIFIC AND TECHNOLOGICAL RESEARCH

11.1 POWER

11.1.1 History of Power Development

A. *Introduction*

Power as part of a nation's economic infra-structure, is of paramount importance in the economic development of a country. The *per capita* consumption of electricity is regarded as an index of progress of a nation and standard of living of its people. In other words the growth of national income and the economic development of a country have invariably been marked by an increase in the *per capita* consumption of power. The *per capita* consumption of electricity in Bangladesh is one of the lowest in the world and so is the G.N.P.

B. *Power Development in Bangladesh in the Pre-liberation Period*

In the pre-liberation period Electric Supplies were in the hands of both public and private sectors. The demand of electricity was rapidly increasing all over the country during the last two decades. But due to inadequacy of trained manpower and managerial skills, and the fact that other industries offered larger profits, much private capital did not flow into electric supply undertakings. In view of the importance of the supply of electric power, Government invested capital in some of the existing major supply undertakings and also acquired others for operation by the Electricity Directorate.

The efforts of the Government in power development were then confined primarily to setting up of local power plants in the main industrial and urban zones with associated high and low voltage transmission and distribution systems, followed subsequently by interconnection of some generating stations. Government initiative also included the gradual taking over of private electric supply undertakings where they failed to give proper service to the customers. The total investment of Electricity Directorate for the period 1947 to 1960 came to Tk. 10·00 crores. The installed capacity rose from 21 MW in 1947 to 74 MW in 1960 and the maximum demand of the isolated systems was 42 MW at the end of this period. Amongst major works undertaken by the Directorate were Siddhirganj diesel and steam station, Chittagong diesel station, Goalpara diesel station, with their associated 33 and 11 KV distribution system. The Directorate initiated the interconnection of Chittagong with Siddhirganj at 132 KV and that of Goalpara with the steam plant at Bheramara.

While Government investment helped to prevent the total collapse of the electric supply industry, it did not go far enough to augment the generating capacity required to meet the increasing demand. Although the Electricity Directorate began to occupy an important role in the generation and sale of electric power, the limitations inherent in the working of Government departments in handling large commercial operations were soon realized. The need for a single, autonomous agency charged with the responsibility of investigating, planning, designing and constructing large scale multipurpose projects for the development of both water and power resources was felt. Foreign aid-giving agencies were also favourably inclined towards such organizations for implementation of power projects in preference to the regular Government departments. Accordingly the Water and Power Development Authority was created. This Authority, besides planning and developing the water and power resources, was authorised to acquire private electric supply undertakings and integrate them, if necessary, with the regional grids. The Electricity Directorate was merged with this Authority. The result of these acquisitions and merger was that by 1961, over 90 per cent of the country's generating capacity was being operated by the erstwhile E. P. WAPDA.

The transfer of the responsibilities of power management to the newly created WAPDA in February, 1960 coincided with the beginning of a new phase in power development. The programme for power development during the period 1960 to 1965 envisaged an outlay of Rs.28·80 crores which was later increased to Rs.37 crores. The expenditure actually incurred was Rs.39·74 crores.

Although the schemes for adding the 3rd unit of 40 MW capacity at Kaptai and the extension of the Siddhirganj Plant by installing a 50 MW unit were initiated, no new generation capacity was added to the system during the period 1960-65 other than the commissioning of two units of 40 MW capacity each at Kaptai. At that time it was thought that the Kaptai capacity would be able to take care of the power requirements of the country for a long time to come. During this period the work of linking Kaptai with the Siddhirganj-Chittagong system and connecting Goalpara with Bheramara were completed. A number of 33 KV and a substantial number of 11 KV and lower voltage distribution lines were built.

Achievement in the Power Sector by the end of 1965 is presented below:

Generation (Installed Capacity)	202 MW
132 KV Transmission Line	170 miles
66 KV Transmission Line	29 miles
33 KV Transmission Line and below	2100 miles
Maximum demand	103 MW
No. of consumers	1,04,000

It was during the 1965-70 period that the power development in Bangladesh received the greatest impetus. A Plan with an estimated cost of Rs.155 crores was taken in hand. Though the actual expenditure incurred during the period was Rs.176·53 crores, *i.e.*, Rs.21·53 crores more than that of the planned expenditure, the physical targets achieved was far below the planned one. This may be clearly seen from the following table:

Item.	Total capacity at the end of June, 1970.	Addition during the period.	Planned targets.	Achievement in percentage of target.
(i) Generation	545 MW	343 MW	607 MW	56·5
(ii) 132 KV & 66 KV Line	647 miles	448 miles	700 miles	64
(iii) 33 KV and below	5620 miles	1182 miles	3260 miles	36
(iv) Maximum demand*	213 MW	110 MW	500 MW	22
(v) No. of consumers	2,20,000	1,16,000	1,46,000	80

*This load was registered in April, 1970 which rose to 223 MW in October, 1970 but dropped subsequently.

The supply position during the 1965-70 period remained unsatisfactory due to delays in the execution of almost all the major generation schemes, occasional failures of the Karnaphuli Hydro-Electric Power Station, breakdown of the Kaptai-Siddhirganj interconnector on account of unprecedented cyclones and above all inadequacy of marketing facilities. The over all picture was one of the shortfalls particularly in respect of demand targets and consequent sales and revenues.

The peak demand recorded in the WAPDA system by the end of 1970 was 223 MW and the total energy generated during the year was 1130 MKWH. Energy generated by non-WAPDA installations in the country, *i.e.*, those owned by the industries themselves during 1970 was of the order of 300 MKWH. The *per capita* consumption of electricity was then 20 units. Depression in power development started soon after, initially due to strikes and lockouts in mills and factories which continued up to March 25th, 1971 and ultimately due to the War of Liberation. The load demand fell to only 30 MW on the day of liberation.

C. *Damage during Liberation War*

The extent of damage suffered by this sector is manifest in the figures of power supply. The decline in demand from 223 MW to 30 MW has been partly due to displacement of urban population and partly due to decline in industrial activity. But the main reason was the destruction of the physical assets of the Power system. This has affected the capacity of the system to meet even the reduced demand. The full revival of the industrial activities in the country will be impossible without the complete rehabilitation of the power system.

In March, 1971 the Liberation War started when WAPDA was busy with improving the quality of the existing service and expanding the system. The result was that all development work was interrupted and the existing service was seriously dislocated. All the grid lines in the country were badly damaged. Over 125 broad based towers of 132-KV and 66-KV transmission lines were damaged. One major 132-KV Grid station has been completely destroyed with the loss of a 50-MVA transformer and other equipment. Similarly distribution lines of different voltages (33 KV, 11 KV and 400 KV), sub-stations of various capacities ranging from 15 KVA to 10 MVA and consumers' connections were severely damaged all over the country. Out of 87 centres of electric supply in the country as many as 52 were affected ranging widely in the character of damages. Some of the isolated Diesel Power Stations in the country (Dinajpur, Brahmanbaria, Satkhira, Meherpur, etc.) have either been completely destroyed or partly damaged.

Besides extensive damages to the installations in service, serious losses have taken place in several central warehouses through fire and other causes during the Liberation War resulting in loss of huge stores meant for operation, maintenance as well as construction. There have also been losses to buildings, offices, furniture, appliances and fittings, vehicles, tools and tackles and construction materials.

D. *The Post-War Reconstruction*

After liberation, full attention was given to restore transmission and main distribution lines for meeting the power needs of the war ravaged economy of the country. Grid power has been made available in almost all the places though some of the sub-stations have been energised with reduced voltage. However, reliability and flexibility of power supply cannot be achieved unless spare materials and equipment are available to repair/replace the damaged facilities permanently.

Temporary arrangement have also been made by installing transformers and switch-gears etc., and repairing distribution lines and consumers' services by utilising equipment and materials out of stock procured for other on-going development work. This has been done on a purely stop-gap arrangement for immediate restoration of power supply to the affected areas.

Apart from physical disablement of the power system in the country and shortage of fuel at the isolated power plants in the remote areas, the sophisticated plants and equipment in the generating stations, grid and distribution sub-stations could not be maintained and serviced properly from the beginning of the War of Liberation to-date due to various reasons. As a result the functioning of much of the equipment has become unreliable which is contributing heavily to the present unsatisfactory state of power supply. Besides, due to lack of original replacement materials which are dependent on imports, temporary and improvised arrangements had to be made in most places to restore power supply immediately after liberation, as has already been pointed out.

To restore the power system to the pre-liberation level as fast as possible a Reconstruction Programme has been under execution by the Power Development Board, the total cost of which stands at Tk.27·6 crores including a foreign exchange component of Tk. 13·10 crores. The work has been planned to spread over a period of three financial years, *i.e.*, 1972-73, 1973-74 and 1974-75. The estimated cost of the Reconstruction Programme for the year 1972-73 is Tk. 4·2 crores which includes a foreign exchange component of Tk. 2·2 crores and the rest will be spent during the year 1973-74 and 1974-75.

11.1.2 The Plan Objectives, Priorities and Policies

The Five-Year Plan has been prepared to create additional capacity to meet our future requirements and also to substantially improve the performance of the power system. The Plan Objectives, Priorities and Policies are summarised below:

A. *Objectives*

(i) To remove the deficiencies of power supply in different regions of the country.

(ii) To remove the imbalance between generation and distribution facilities.

(iii) To sustain economic growth by meeting the increasing needs of the productive sectors of the economy.

(iv) To embark upon an effective rural electrification programme in conjunction with electrification of pump irrigation/drainage as well as cottage industries with a view to stimulating the rural economy and to provide the rural population with their share of the benefits of power supply.

(v) To improve the quality of service especially for industrial requirements and activities directly relating to the revival of the economy.

B. *Priorities*

(i) Improvement and addition of physical facilities specially in the transmission and distribution system.

(ii) Building generation capacity in the Western Zone to meet the demand. This is necessary in veiw of the fact that electricity cannot be transmitted from the eastern to the western grid.

(iii) Completion of the on-going and reconstruction schemes.

(iv) Improvement of the quality of service especially for the industrial requirements.

C. *Policies for Plan Implementation*

(i) Re-organization of power sector implementing and regulating agencies including training facilites.

(ii) Developing indigenous manufacturing capacity for production of basic electrical equipment and materials.

(iii) Power tariff will need to be so fixed as to include cost of the service except in the case of rural electrification where marginal cost of electricity may be charged.

(iv) Assist agricultural production programme through electrification of pumps and tube-wells.

11.1.3 The Plan Strategy

A. *Strategy*

The electrical system in Bangladesh is divided geographically into two completely independent zones, namely, the eastern and western zones separated by the Jamuna/Brahmaputra River each having a separate supply network. Natural Gas reserves in the eastern zone, however, are appreciable with scope for extensive expansion for cheap thermal power generation. The flat deltaic land offers little scope for the generation of large scale hydro-electric power in either of the zones. Though there is some potential for hydro-power in the eastern zone, there is little scope for this in the western zone. The western zone at the present moment, therefore, is the high cost energy area, dependent on imported fuels. The main rivers with large seasonal variations of water discharges and shifting beds make reliable inter-connection between the two zones difficult and costly.

Therefore, the two zones will be developed separately during the First Five-Year Plan. The two systems may have to be interconnected at an early date if increased demand justifies such integration. In addition to reducing the requirement of reserve capacity and improving the reliability of both the systems, it will allow for optimum use of low cost energy available in the eastern zone from natural gas. However, part of the interconnector, Ghorasal-Tongi including the sub-station at Bheramara should be comp'eted during the First Plan period to provide an alternative supply to Dacca area. A study will be undertaken to examine the technical and economic feasibility of the East-West interconnector. The timing of construction of the interconnector will be determined on the basis of this study.

As the distribution projects in the past could not be financed as scheduled compared to generation projects, there is an imbalance between generating capacity and transmission and distribution facilities. This Plan, therefore, attempts to achieve a balance between generation and marketing facilities through higher allocations to distribution. The different isolated systems need to be interconnected by transmission lines and the existing one's strengthened to increase the capacity for carrying a large quantum of power in order to meet future needs.

B. *Rural Electrification*

The existing pumps and tube-wells for irrigation are powered mainly by diesel. It has been established that electricity is a cheaper and more reliable source of power which, *inter alia*, reduces the enormous distributional problems implicit in the diesel based motive power in the countryside. For this reason providing electricity to low-lift pumps and tube-wells has been identified as a key Plan objective for this sector.

In rural areas where electricity is introduced for irrigation, cottage and small scale industries can be simultaneously energised. This Rural Electrification will revolutionise the rural economy and also go a long way to modernising the habits and social activities of the people and will thus contribute to bridging the gap between urban and rural life.

Although rural electrification will stimulate the economy through increased production in agriculture and industry, it may not in the short run bring adequate financial return on the investment, even if the tariffs are comparable to those prevailing in the urban high density loading areas. The programme will be economically viable only with the spread of electricity in the rural areas which can be accelarated by the formation of cooperatives of the users of electricity.

C. *Indigenous Manufacturing Capacity*

In order to meet the development target in the Power Sector in the foreseable future with reduced dependence on foreign assistance great emphasis should be given on creating indigenous manufacturing capacity for the production of a variety of electrical goods, currently procured through import. This import is at present largely financed by foreign assistance. There will be enough demand for equipment, machinery, cable and appliances to justify the establishment of manufacturing units.

At the moment the indigenous manufacturing capacity for electrical equipment, machineries and accessories, specially for capital goods is small. The demand for power and lighting PVC cables up to 11 KV could be met from Eastern Cables, Chittagong having a production capacity of 6,000 tons of various sizes and types such as multicore, armoured, screened cables, etc. It is envisaged that the factory will be expanded and production processes will be diversified to include ACSR, Super Enamelled Copper Wire, Flat Copper Bars, etc.

We have a considerable demand of ACSR conductors in our electrification programme. It is expected that the requirement will amount to 2500 tons a year during the First Five-Year Plan. Manufacture of round and rectangular cross-section super enamelled and cotton covered copper wires will be required in large quantities (800-900 tons per year) for the General Electric Manufacturing Plant being set up by the Engineering and Shipbuilding Corporation (BESC). S. Gazi and Co. also under BESC who are at present producing super enamelled copper wires, may be expanded to meet the requirements of the same during the First Plan period and beyond.

The only heavy electrical complex, the General Electrical Manufacturing Plant located at Chittagong, with an annual capacity of 10,000 tons of electrical equipment is being set up with assistance from the USSR and is expected to go for commercial production by 1976. When completed this will meet our requirement of distribution and power transformers up to 10 MVA capacity and voltage up to 33 KV, high voltage switch gears up to 33 KV, low voltage switch gears, distribution pannels, fuses, capacitors, potential transformers, etc. Before the GEM Plant goes into production, semi-knocked down (SKD) parts may be imported from USSR and assembled at the GEM plant training centre/workshop which will save foreign exchnage and at the same time train our people.

In addition to the above the following items which are vital for the successful implementation of our electrification programme should be manufactured within the country:

(i) Poles—tubular steel poles, pre-stressed concrete poles, wooden poles, lattice steel towers, etc.

The only indigenous source of line supports in the country were the wooden poles which did not prove satisfactory. Even when creosoted these did not last for more than 4/5 years. As a result line supports have mainly been imported. In view of the huge demand for line supports and the need for having them in different types for different purpose, plants for manufacturing poles need to be set up within the country during the Plan period.

(ii) Insulators *e.g.* Pole insulators (33 KV, 11 KV and 0·4 KV), insulating bridges and bases for switches, cut-outs, fuse, distribution board, etc. There is enough demand for these items to justify the establishment of a manufacturing unit. Basic raw material is available in abundance at Bijoypur, Mymensingh. Investigation made by BCSIR Laboratory indicates that the beneficiated Bijoypur clay is a siliceous Kaoline of primary origin and is suitable for production of insulators and white-wares. But for the production of 11 KV and 33 KV insulators further investigation may be necessary.

(iii) Switches:

(a) Iron clad switches, distribution board, etc.

(b) Tumbler switches, holders, plugs, ceiling roses, push button switches, etc.

(iv) Bulbs, (v) Meters, (vi) Fans, (vii) Conduits, (viii) Domestic fittings and appliances, (ix) Motors and (x) Fire bricks.

D. *Energy Resources in Bangladesh*

Hydro-Power: Bangladesh is a flat deltaic terrain through which flow the two largest rivers, the Ganges and the Brahmaputra, with their tributaries to the Bay of Bengal. The total fall from the north of Bangladesh to the Bay of Bengal is hardly 60 feet (18 meters). Although millions of cusecs of water flow down the plains, the potential for the development of large scale hydro-power is limited.

The hilly rivers in the south-east portion of the country have possibilities of generation of some hydro-power. The Karnafuli river in the Chittagong Hill Tracts has been harnessed to yield 80 MW capacity to which another 50 MW would be added in about two years time. There is possibility of having another 100 MW from the same reservoir for peaking purposes. The Sango river holds promise for 87 MW indicating installation of two units. The Brahmaputra, in the northern part of the country can generate about 400 MW firm capacity out of 1000 MW Peak Hydro-Power, if it is harnessed by means of a barrage. But this is a long-term possibility.

Coal: Exploration carried out by Geological Survey of Bangladesh with the assistance of the United Nations Development Programme has led to the discovery of substantial deposits of good quality coal in Bogra District in the north-western part of the country. The estimated reserve is about 700 million tons which in heating value is equivalent to about 2·5 times the proven gas reserves. Therefore, as a potential source of energy, this coal can play an important role in the energy economy of the country. The coal lies at a depth of 3000-4000 feet under alluvial soil and its extractions would require the use of sophisticated, costly and time-consuming mining techniques including freezing. Utilization of this source for power generation would need to be phased over subsequent Plan periods. At present feasibility study on the most economical use of coal at Jamalganj is under way.

Oil: Bangladesh has no known oil reserves. It imports about a million tons of crude oil per year which is refined locally at Chittagong. In addition a substantial quantity of middle distillates is imported. The Chittagong refinery with a crude oil capacity of 1·5 million tons a year produces different grades of refined products including about half a million tons of

furnace oil which today can just meet the requirement of the country. Oil is used in substantial quantity in the western zone for power generation where no alternative fuel is available. However, when the proposed East-West Interconnector is completed, the power produced in the Eastern Zone could be used in the Western Zone and this may reduce the need for oil in the Western Zone for Power Generation.

Natural Gas: Natural Gas constitutes the most important indigenous resource for Bangladesh. It was in 1955 that gas was discovered. The seven known fields, all located in the Eastern Zone, have estimated reserves of 8·29—9·36 million million cft. The prospects for finding more gas fields in this area are very bright. But no gas has been found in the Western Zone. There are some indications that gas may be found in the Western Zone also and exploratory drilling is contemplated in the Barisal area.

The gas found in Bangladesh is of very high quality having methane content ranging from 95—99 per cent. This makes it not only an important industrial fuel but also a very valuable chemical raw material. A detailed analysis of the use of gas as fuel and potential industrial raw material has not been done and the economic price of gas has not yet been determined. However, if an allocation of 45 per cent out of the proven reserve is assumed for power generation then the natural gas reserve would support about 3200 MW of the gas fired capacity over its economic life at 50 per cent Plant factor.

11.1.4 The First Five-Year Plan

A. *The Development Plan*

The eastern zone has nearly 80 per cent of the total electrical load of the country. This zone also has low cost hydro-electric resources and abundance of natural gas. The electrical grid serving this region is quite extensive, comparatively well developed and fairly reliable. On the other hand, the western zone has only 20 per cent of the total load. This region has no developed fuel or hydro-electric resources and relies mainly on imported fuel oil for its energy needs. The electrical system serving this zone is not as developed as in the eastern zone and its performance is poorer and reliability lower.

Traditionally, the first step in planning the expansion of an electric power system is to forecast peak demand to determine maximum generating capacity and to determine the total amount of energy required annually. The second step is to identify the various possible sectoral development strategies, *e.g.*, varying combinations of hydro and thermal plant in different sizes/sequences which would both meet the anticipated demand and satisfy the system's technical requirements. The third step is to select the alternative which has the lowest present value of capital and operating costs at a reasonable test rate of discount. Revenues do not enter into this calculation since they are assumed to be equal for all strategies.

B. *Load Forecast*

The power requirement was assessed by WAPDA in 1963-64 on the basis of the planned investment programme of different sectors of the economy which indicated a maximum demand of 540 MW (500 MW for WAPDA system and 40 MW for industries having their own generation) by June, 1970.

Forecast of peak demand was also made by different agencies in the past such as M/S. I. E. Co., General Consultant, Harvard Advisory Group, EPWAPDA (Power), Power Commission, Black and Veatch International Company, etc. These forecasts shown in Annexure 1 were not widely different except the one made by M/S. Black and Veatch which indicated a lower peak demand. In the case of the Master Plan and Power Commission, the peak demand during the base year had been assumed to be much higher than what was actually been achieved. Planning Department and WAPDA forecasted a higher rate of load growth, namely, 36·5 per cent and 33·5 per cent respectively during the period based on the investment programme of the Industry and Agricultural sectors.

Development Programme for 1965—70 was based on an anticipated peak demand of 540 MW in 1970 including 40 MW for industries having their own generations. It may be seen from Annexure II that WAPDA achieved a peak demand of 223 MW as against a forecast of 500 MW which shows clearly the shortfall in achievement of various types of anticipated loads. The major reasons for such a shortfall were as follows:

(i) Non-completion of the proposed industries and agricultural projects;

(ii) Recurrence of cyclones, tornadoes, floods and other disturbances;

(iii) Lack of financing especially in the distribution of Power.

Peak load demand recovered to 225 MW in June, 1973. However it is yet difficult to anticipate precisely when the consumption of power will return to the level of 1130 million KWHR experienced in 1970. It is reasonable to assume that once the economic life of the country fully revives, it will again experience a rapid increase in power demand.

The industrial load consists mainly of jute processing and cotton textile mills, chemicals, fertilizer, insecticide and pharmaceutical plants, and three paper mills, *plus* numberous sugar mills. Of these, the majority of the sugar mills and two of the paper mills are on the western grid, the chemical plants and most of the textile mills are on the eastern grid, while the jute mills are more or less evenly distributed on both grids. There is also a cement plant, a steel mill and an oil refinery on the eastern grid, and a shipyard at Khulna on the western grid. In the First Five-Year Plan emphasis has been placed on development of agro-based industries, natural gas-based petrochemical complex, and a machine tool factory together with further expansion of the steel, textile, jute, paper and chemical industries.

The present agricultural load consists of two fairly large pumping schemes, G. K. Project at Bheramara on the western grid, and Dacca-Narayanganj-Demra Project near Dacca on the eastern grid, and a tube-well scheme at Thakurgaon in the north-western area of the country. With the large scale irrigation programme proposed in the First Five-Year Plan the power requirements of this sector will grow rapidly from the present low level.

Preparation of the load forecast according to normal utility practice is to be based on data collected from each on a sub-station by sub-station basis for various load classes, *e.g.*, domestic, commercial, industrial and agricultural. Since the data on the industrial prospects, by far the largest load class and the agricultural predictions (geographical locations) have not yet been firmed up and no detailed up-to-date market survey is available, three procedures have been adopted to arrive at a reasonably good load forecast, namely, (i) load growth based on historical-trends, (ii) load projection based on planned investment programme of different sectors consuming power, (iii) load projection based on a population related equation,

C. *Summary of Load Projections*

The methodology and background data for projecting load growth according to the three techniques indicated above are presented in Annexures III—V. The summarised results of these forecasts are presented below:

Year.	Growth based on historical trends.				Growth based on Investment Programme.				Growth based on population related equation.			
	Peak demand MW.		Energy $10^6 \times$KWhr.		Peak Demand MW.		Engergy $10^6 \times$KWhr.		Peak demand MW.		Energy $10^6 \times$KWhr.	
	East Zone.	West Zone.	East Zone.	West Zone.	East Zone.	West Zone.	East Zone.	West Zone.	East Zone.	West Zone.	East Zone.	West Zone.
1978	373	144	1940	768	..	..	..	..	357	138	1900	758
	=517		=2718		=517		=2735		=495		=2678	

It may be seen that projections following historical trends, population related equation and investment programme compare quite closely with one another. For the Plan forecasting purposes it has been assumed that 515 MW (375 MW for East Zone+West Zone 140) and 2600 MKWH (East Zone 1900 MKWH+West Zone 700 MKWH) will be achieved at the end of the Plan period. In addition there will be a 40 MW Peak load for industries having their own generation. It has been planned to reduce the system-losses from the existing 25% to 20% during the Plan period thereby reducing actual loss by 100 million KWhr. Energy-demand estimate has been lowered by that extent.

11.1.5 The Investment Programme

A. *The Eastern Grid*

This consists of a double-circuit 132 KV line from Kaptai Hydro-electric Plant through Chittagong and 160 miles north-westerly to Siddhirganj Plant near Dacca, continuing north-easterly to Ashuganj and Shahjibazar Plants. It continues some 75 miles beyond Shahjibazar to Sylhet as single-circuit line of which the last 45 miles are yet to be commissioned. A 132 KV radial feed from Ashuganj traverses a north-westerly route terminating in Jamalpur; this is still under construction. Distribution to outlying areas adjacent to this grid is effected through the use of radial 33 KV and 11 KV feeders. The transmission line designs in this Zone are primarily double circuit steel towers with both circuits strung. Exceptions to this are the Ashuganj-Jamalpur and the Shahjibazar-Chhatak line sections, which have only one side strung. The installed capacity of the PDB system in the eastern zone is 439 MW (Annexure VI). By type of generation the system has 208 MW (47 per cent) of steam generation, 80 MW (18 per cent) of hydro and 114 MW (26 per cent) of gas turbine and the rest are diesel. In addition to these units, 82 MW of industrial generation is located throughout the system.

B. *The Western Grid*

The Western Grid consists of a single-circuit 132 KV line from Goalpara extending more than a 100 miles north and across the Ganges river to Ishurdi. It is being extended east-by-south from Goalpara some 56 miles to Barisal and 190 miles northward from Ishurdi to Thakurgaon. The major generating units (Annexure VI) include four 4-MW steam sets, two

12-MW and one 6-MW naptha-fired combustion turbine sets, and seven 1-MW diesel sets at Goalpara and two 4 MW steam units at Bheramara. A new 60 MW steam unit is nearing completion at Goalpara. The western grid has suffered extended periods of shortage of generation due to extensive forced outages, and load shedding was often necessary. The projected peak load for this grid is 63 MW when the on-going transmission line extensions are completed. This load could be carried by the 60 MW unit at Goalpara which should be in service soon and the diesel and gas turbines may be shut down because of their much higher fuel cost. But this situation will pose a very serious threat to service continuity because any trouble on the big boiler turbine-generator could result in complete grid outage, and service restoration with small generating units would be slow and complex. This situation would be much improved by having another 40/60 MW unit installed either at Goalpara or at Bheramara/Ishurdi.

A summary of eastern and western zone generation is shown in Annexure VI. The loads which are now served by isolated diesel stations will be picked up on both the grids when the line extensions in progress are completed. The load distribution (MW) in 1970 for the whole country is shown in Annexure VII.

C. *Capacity Expansion*

Given the construction lead time, decisions about capacity expansion have to be made several years in advance. Thus, they have to be based on projected loads rather than on actual ones. Load projection have a margin of uncertainty. The construction schedule of new capacity is also uncertain, so is the reliability of the equipment already in service. The investment programme and the annual financial requirements visualised in the Plan are somewhat approximate, since much of the data necessary for accurate compilation was not available. None of the major projects should, therefore, be implemented before being subjected to a careful scrutiny. Eventually, of course, accurate load forecasts will have to be developed for making the capacity planning process effective.

In the case of the eastern grid, there will be a large surplus of generation capacity at least during the First Five-Year Plan assuming that the load demand continues to grow at the same rate as over the past 10 years. This being so, there is no immediate pressure to establish a reserve capacity. Since the present overall surplus (theoretical) in the western grid is relatively smaller than in the eastern grid, the question of capacity expansion will arise first in the western grid. Even after the commissioning of the new 60 MW unit at Goalpara, the western system will be difficult to operate because of the complex character of the system. When the main 132 KV lines are completed, there will be approximately 63 MW of peak demand, catered for by a single 60 MW steam set, backed by an array of some 30 small units, the two largest of which are only 12 MW each.

The most promising solution to this particular problem would be the establishment of another 60 MW capacity at Khulna, which may be a duplicate of the existing unit. As a result spare parts could be shared, each would provide a reserve for the other, operator training would be simplified, and maintenance procedures would be the same. But, we may not afford to wait for 4/5 years, which is the time normally required to complete the entire process from designing to commissioning a steam turbine plant. The alternative appears, therefore, to be the establishment of a 40/60 MW gas turbine plant at Bheramara/Ishurdi which could be put into operation in about 2 years time. To meet the anticipated demand in the western zone another 60/100 MW or so capacity may be required to be commissioned by the end of the Plan period.

D. *Investment Programme*

One of the objectives of the industrial plan is to provide for proper development of modern and efficient industries widely dispersed throughout the country. And one of the objectives of the power sector plan itself is to embark upon an effective rural electrification programme. Both of these objectives will lead to widely scattered loads all over the country necessitating extensive transmission and distribution facilities which the present system lacks very badly. The power sector programme has been designed to ensure extensive transmission and distribution facilities subject to our resource constraints.

The power development plan envisages an investment of Taka 423·5 crores including Taka 200·9 crores in foreign exchange to achieve as much of the sectors' objectives as possible. The investment programme has been classified into reconstruction, on-going and new projects. An allocation of Taka 23·4 crores including Taka 10·8 crores of F. E. is made for the reconstruction projects. For the completion of all the on-going schemes a provision of Taka 110·7 crores including a F. E. component of Taka 53·6 crores has been kept in the Plan. The emphasis on new projects is by far the largest and an allocation of Taka 289·4 crores has been provided which is about 68 per cent of the total investment in the power sector. Annexure VIII gives a summary of the total investment allocations and foreign exchange requirement for each sub-sector.

E. *Plan Strategy*

(i) Emphasis has been placed in the Plan on transmission lines in order to provide adequate interconnection of power stations and to reach all major load centres by high voltage transmission lines from central generating stations. Enough provision has been made for speedy completion of the on-going transmission projects. The total allocation for this sector stands at Taka 40·2 crores.

(ii) Highest priority will be given in the Plan to the secondary transmission and distribution programme for which an allocation of Taka 267·2 crores has been made. This is 63 per cent of the total allocation.

(iii) In order to improve the level of reliability some alternative supply arrangements have been provided for apart from renovation of the existing distribution mains.

(iv) New areas are to be opened up for electrification, so that electricity is made available to the masses within the limits of our resource constraints.

(v) It is envisaged that in addition to the electrification of Water Development Board's central pumping stations and 2,440 deep tube-wells, 8,000 deep/shallow tube-wells and low-lift pumps of BADC, 1,000 villages will be electrified during the plan. In the rural areas the immediate task will be centred round electrification of pumps which will be nearer to the existing lines initially. This will be gradually extended as the economy picks up. Electrification of villages will at this stage follow as a by-product of the tube-well electrification programme rather than as a prime objective.

(vi) On the generation side only one additional 60/100 MW Unit at Goalpara Station will be added during the plan period in addition to the completion of the on-going schemes. This includes the 40/60 MW North Bengal Power Station. A token provision has been kept

for two more 100 MW units, one in the Western Zone and one in the Eastern Zone. Installation of further units on either side are, however, predicted by a comprehensive feasibility study to identify the optimal mode for catering to the need for additional power in the western region.

There are several alternatives for the future development of the power system in Bangladesh:

(i) The first alternative assume that each zone will continue to develop independently, thus maintaining its own development schedule consonant with natural resources indigenous to the region. This assume discovery of gas or availability of coal or use of Nuclear Power in the Western Zone.

(ii) The second alternative assumes that the two zones will be interconnected through a high capacity intertie. In this case, joint system development could occur and optimization of system reserve through sharing of reserve capacity could be secured. Low cost energy (gas fueled) generated in the east could thus be used in the west.

(iii) Alternatively gas could be piped across to the west to feed the power stations. But the main rivers with large seasonal variations of water discharges and shifting beds make reliable interconnection through gas pipe line between the two zones difficult. A thorough study is, therefore, needed.

(iv) Coal as a source of power may be examined both in terms of imports from India and the early exploitation of reserves in Jamalganj.

(v) The possibilities of atomic energy as a source of power is to be fully evaluated in comparison to the above options. These options must in turn provide guidance for either expansion or creation of new refinery capacity.

All these alternatives including that of Rooppur Nuclear Power Plant which is currently under study need to be weighed and the most suitable solution found before any major financial commitment can be made. When definite information is provided by the feasibility study the power programme will be reviewed and if necessary additional resources will be made available for creation of the additional power source.

Lack of education and skill in a very large section of the operating and maintenance personnel was identified to be one of the biggest handicaps for quality services. Adequate provision has, therefore, been made in the Plan for the different training programmes so that our dependence on foreign consultants and specialists is gradually reduced. Taka 16·2 crores has been kept for the technical assistance programme. This is in addition to the training programme under aided projects and the technical experts needed for erection and commissioning of such projects. Provision has been kept for technical experts and consultancy services of a general nature and training of our personnel at home and abroad for the development of critical skills and know-how. Requirements are heavily weighted (to the extent of two-thirds) in the direction of equipment needed for creating training facilities within the country.

The unreliability of the present power system is largely due to the lack of adequate physical facilities. It is, therefore, considered important to create as much additional physical facilities as possible during the plan period for which adequate allocation has been made.

11.1.6 Improving Performance of the Power Sector

A. *Quality of Service*

It has been a common occurrence for power supply to fail frequently and often for prolonged periods. This has caused great inconvenience to the consumers in general and substantial production loss to the industrial sector in particular. In addition there have been persistent complaints regarding the poor quality of services (poor voltages, fluctuation of voltages and frequency of supply).

Whilst power failures are hardly a new phenomenon, in post-liberation Bangladesh the damages to the distribution system during the Liberation War has aggravated the problem in in specific areas such as the industrial sector. This has had some impact on the recovery of industrial output and therefore needs urgent attention.

B. *Some Factors Affecting Performance*

Indecision of the Management

Lack of initiative in decision making was aggravated by labour/management problems.

Labour Problems

(i) Retrenchment of employees is difficult even where work has been completed.

(ii) It has also not been possible to use this surplus man-power in areas where there is deficiency as employees were reluctant to leave their respective areas and go elsewhere.

(iii) Where there was adequate work, departmental workers demanded additional payment in various ways for doing such work but higher productivity of outside workers made it more economical to engage contractors to get such work done thus allowing the departmental man-power to remain idle.

Loss due to Pilferage, inaccurate Meter Reading, etc.

The total units generated by PDB during 1970 totalled 1130×10^6 KWHR but only $898 \cdot 9 \times 10^6$ KWHR was recorded as sales to customers. The greater portion of this difference of 279×10^6 (about 25 per cent of the total Generation) is energy lost. This represents not only losses in transformation, transmission and distribution but also losses on account of pilferage, inaccurate metering, incorrect meter reading and billing. If proper corrective measures were taken, losses could perhaps be brought down to 15 per cent of generation. A mere one per cent reduction in losses in 1970 would have meant an increase in sales of approximately 11×10^6 KWHR and a revenue increase of about Taka 22 lakhs.

Fuel Problem

Owing to periodical shut-down of the Oil Refinery as well as other reasons regular supply of fuel to many power stations posed a serious problem. Even when fuel and lubricants were available, difficulties in transportation have often prevented their movement and caused crisis.

Availability of Trained Manpower

Due to the departure of the Engineers, Technicians and Skilled workers there has been shortage of technical man-power specially in the construction firms resulting in difficulties of implementation.

C. *Suggested Actions for Improved Performance*

The above analysis of the factors affecting improved performance in the power sector indicates that while there is certainly a need to make greater use of the generating facilities, that by itself is not enough to make the Power Development Board self-sufficient. There is, in addition a great need to improve the efficiency of the operation itself by changes in organization, methods and procedures. In so re-organising the power sector the problems involved and the course of action recommended are presented below:

(i) Though the WAPDA has been bifurcated into Bangladesh Power Development Board and the Bangladesh Water Development Board since 31st May, 1972, this bifurcation cannot alone be expected to achieve the desired objective as there are serious built-in deficiencies in the working of the Power Wing itself.

(ii) The generation, transmission, distribution and sales of power are entrusted to a single executing agency under the administrative control of the General Manager. The management and sale of power for efficient and dependable service call for a management concept radically different from that required for installation and maintenance of generating stations and transmission lines. The rapidly multiplying number of electricity consumers in the electrified cities and localities, requires employment of linemen, line-supervisors, hundreds of meter-readers, billing clerks, etc. This is likely to throw a great strain and an unnecessary burden on a single executing agency responsible for the generation, transmission and sale of power.

(iii) In the Power Development Board there are fifteen department heads reporting to the General Manager which seems to be unwieldy for effective control and administration. The importance and magnitude of projects for the generation and transmission of power as well as their operation and maintenance make such heavy calls on managerial resources that a single agency is unable to maintain contacts with large sections of the public or to attend to a variety of demands from the consumers spread over the country. To relieve the personnel responsible for the generation and primary transmission of power from this otherwise unnecessary burden, it is necessary that the business of distribution and retail sale of power to hundreds and thousands of consumers all over Bangladesh should be entrusted to a separate agency under the Power Development Board exclusively set up for the purpose. The Power Generation and Transmission Wing of Power Development Board should then concentrate their resources and address themselves primarily to the business of generation, transmission and sale of bulk power.

(iv) The Power Supply and Distribution Wing under Power Development Board may run on commercial lines and operate for the entire country. It will deal with a variety of commercial and local problems and therefore it is desirable to decentralise their management and operation by self-contained and properly staffed regional branches which should look after the distribution business in defined areas such as Dacca, Chittagong, Khulna, etc., placed under their jurisdiction.

(v) Since rural electrification may not initially be a commercial proposition the Power Supply and Distribution Wing may not undertake this work on a large scale. Rural Electrification on a large scale may be undertaken as part of the rural development programme on the basis of co-operatives. Liberal credit facilities will be needed as most of the rural population may not even be able to bear initial expenses of doing the internal wiring of their houses. For the purpose of planning, designing and actual erection work a Rural Electrification Wing may be set up in the PDB.

(vi) The above structural changes will improve the operational efficiency of the Power Development Board which ultimately will improve the quality of service. In addition to the above, the establishment of a properly constituted organisation for the administration of regulatory control over the activities of the power supply authorities is also a prerequisite to the improvement of the quality of service, reducing dissatisfaction among the consumers and conflict and disputes between the consumers and supply authorities. A strong regulatory organisation will also:

(a) effectively discharge the statutory functions and set up standards for safety and sound engineering practice commensurate with the laws and regulations of the land,

(b) minimise badly constructed electrical installation which are liable to frequent power failures, and

(c) minimise the losses of life of workmen and members of the public for not adhering to the safety rules.

Personnel Policies

(i) The Power Development Board seems to be handicapped in its efforts to improve the efficiency of the operation by the personnel policies in effect. The personnel policies generally set the tone of an organisation and are reflected in the attitude of the employees. The personnel policy of Power Development Board must be revised to encourage all levels of management to assume responsibility and exercise authority. To motivate them for better work more weight will need to be given to merit, ability and initiative and less to seniority, when considering cases for promotion. Generally such promotion should be within an individual's existing field of work. The traditional practice of promotion irrespective of good, indifferent or bad performance will never stimulate the personnel concerned for quality performance. Good work must be rewarded and proper motivation should be there for this.

(ii) To give guidance to the employee and ensure that he exercises specified responsibility, position or job descriptions should be prepared. Eventually job evaluation should be made to serve as a guide for promotion.

Training

(i) Lack of education and skill in a very large section of the operating and maintenance personnel appear to be one of the biggest handicaps for quality service. A very systematic in-service training at all levels has to be launched under each unit of Power Development Board's operation to achieve the desired result. Steps were taken to provide training through the establishment of Kaptai Engineering Academy and the Training and Research Institute at Tongi. To date, however, both the Kaptai and Tongi establishments have been inordinately underutilised.

(ii) To be effective the training programme needs to be up-dated and streamlined and Kaptai and Tongi establishments revitalised. Training must become a continuous process and in particular should include on-the-job training at the basic operating and maintenance level.

Improving Managerial Efficiency

(i) *Accurate information on Assets and Liabilities*: Accurate information on capital investment in plant and equipment is needed to determine the proper depreciation rate and adequacy of the depreciation reserve; to develop the cost data required in rate making; and to arrive at the rate base to be used when fixing the rate of return required to maintain the operation in a sound financial position. The present accounting procedures of Power Development Board are entirely inadequate, by modern standards, since they provide little of the information essential to the effective financial management of a power utility. In particular, the present accounting system is largely on a "Cash" basis which consequently does not provide adequate information on the amortised value of existing plant and equipment.

(ii) *Purchasing Policy*: Purchasing polices and the management and control of inventory have a great deal to do with the financial results and efficiency of a utility. Improvement of financial management and procurement depend on steps taken towards evaluation of inventory, standardization, provision of standard specifications, development of local industry as sources of supply.

(iii) *Inventory*: It is essential to have an inventory of the stored imported equipment and the plan of their utilisation. An inventory and maintenance team should go over the entire system periodically. At each location the useful items should be separated from the obsolete or damaged ones. Damaged and obsolete equipment should be taken to a central repair depot for salvage. Obsolete supplies or those damaged beyond repair should be written off and sold if possible. Immediate steps should be taken to inventorise all weather-sensitive equipment now stored out-doors and arrange for its dry, covered storage.

(iv) *Clearance and Movement*: The entire clearance and movement function requires streamlining, improved coordination and some re-organization if costly delays and unnecessary expenditure are to be avoided. Malfunction in the operation of clearance and movement has disastrous and sometimes irreparable effects on the progress schedules of construction and development projects.

(v) *The KWH Meter*: The KWH meter is the cash register of the Power Development Board and as such it deserves more attention than it usually gets. Care must be taken to ensure that meters bought suits the purpose for which they are to be used, are rugged, easily installed and tamperproof. The meter and metering installation at least for large industrial loads should get special attention. Due to the large consumption of this type of load a small error in metering can have a serious adverese effect on gross revenue, either through under-billing the customer or over-billing and forcing him to look elsewhere for his source of energy.

(vi) *Financial Forecast*: Due to the capital intensive nature of an electric utility, it is most important that effective control be exercised over items proposed for inclusion in the capital budget, to ensure the most efficient use of the available funds. In PDB's case, this control is doubly important in view of the extreme shortage of available capital, so that critical review of proposed capital investments is essential in order to maximise the benefits obtainable from limited funds. A seperate financial forecast should be maintained and up-dated every year, covering at least the next five years. This will give ample time for arrangement of necessary financing

(vii) *Progress Reports*: Management of the Power Development Board at all levels is severely handicapped in its ability to manage and control affairs due to lack of timely, concise and pertinent financial, operating and progress reports. As the reporting goes up the line of management it should be consolidated, condensed and only data of significance to the next echelon retained. To be useful, reports must be accurate, complete, produced with a minimum of delay and received on time. A suitable reporting form could be devised. It is through an efficient information system that necessary control over autonomous institutions can be exercised.

Physical Facilities and Improvement of Service

(i) *Improved Capacity*: Since one of the major reasons for the present lack of reliability of the power system is inadequacy of physical facilities, it is of vital importance that the planned development work specially the distribution facilities are completed within the earliest possible time. Additional sub-station capacity and loop lines should be created to provide alternative sources of supply. Voltage regulators and static condensers should be installed to stabilise the voltage to consumers. Fuse gears for important load centres should be replaced by circuit breakers. 33 KV and 11 KV automatic reclosures for controlling spur lines as well as sectionalising long secondary lines should be installed.

(ii) *Coordination of the Protective Devices*: Coordination of the protective devices of the various 132 KV lines and sub-station is indispensable for a reliable power supply. Already a number of deficiencies have been discovered and to the extent it was possible without the import of additional equipment, arrangements have been modified on the basis of recalculations. Extensive work is yet to be done in this field so as to improve the co-ordination. This is the result of heterogeneous imports from different countries creating a condition of ill-matching in the power system which ultimately influence the performance of the supply. A team of Engineers should, therefore, be trained exclusively for relay coordination who will constantly check the operation of relays for trouble-free service. Additional equipment required for the improvement and removal of deficiencies in the system should be imported without loss of time.

(iii) Extensive maintenance work is necessary to remove the deficiencies in the distribution system. The prevalent practice of maintenance should be gradually replaced by fast moving trouble shooting vans equipped with workshop facilities. Special efforts should be made for improving the communication system including introduction of radio telephones. A comprehensive communication system consisting of power line carriers, VHF radio, including mobile telephone is essential for safe and economical operation of any electrical system. Without it, it is impossible to give the continuity and reliability of service demanded by the consumers. An investigation should be made of the overall needs of the Power Development Board and long-term plans formulated making full use of existing power line carrier and radio links.

(iv) *Planned Maintenance*: To raise the effective efficiency of power plant immediate steps should be taken to integrate operation and coordinate maintenance programmes so that the period of outage of any unit for routine maintenance and the number of such outages at any given time are kept down to the bare minimum. The scheduling of planned outages on an annual basis could help to develop better preparation for use and maintenance time. When planned maintenance has developed and schedules are made and followed, it may be found justifiable to use round-the-clock work during maintenance outages to minimise outage duration, specially in the western grid.

Quality of Supply

Highly reliable power supply calls for a very capital intensive system with automatic devices which our economy may not permit at the moment. But the huge loss that our

production sector is incurring due to power failure makes a strong case in favour of quality supply so as to reduce immediately the power interruptions, at least in the major industrial areas of the country. Moreover, there appears to be a crisis in the confidence of the people in general and therefore, investment for rehabilitating the confidence through reasonably trouble-free supply needs immediate attention.

Luxurious Construction

Luxurious and unproductive constructions should not be undertaken at all. All construction work should be standardised by the Government as far as practicable.

Annexure I

COMPARATIVE STATEMENT OF DIFFERENT PEAK LOAD AND ENERGY FORECAST

Agency.	Base-year.			Annual Load growth per cent.	1970		
	Peak demand (MW)	Energy Mkwhr.	Load factor. per cent.		Peak demand (MW)	Energy Mkwhr.	Load factor per cent.
Master Plan ..	297 (1966)	1,357	55·5	22	614	2,836	52·6
Planning Deptt. ..	88+1·5 =89·5 July 1964 Peak+ other non-grid.	466·0	59·5	36·5	576·5	2,830	56
EPWAPDA Forecast for 1970.	88 July 1964 actual.	457·636	59·22	33·5	500 540 (including generation by industries themselves.	3007·5	68·4
Power Commission	246 (1965)	1,100	50	15	493	2210	50
Black and Veatch International Company.	96 (1964)	471	56	23	331	1,625	56

Annexure II

PLANNED ADDITION VIS-A-VIS ACTUAL ACHIEVEMENT IN RESPECT OF LOAD DEMAND DURING THE PERIOD 1965-66 AND 1969-70.

Complex.	Additional Peak Load (in MW) by 1970 (Planned).	Actual achievement Peak demand in MW by 1970.
1. Jute	40·10	35·4
2. Textile	70·90	9·3
3. Fertilizer	26·05	5·0
4. Cement and Limestone	25·30	....
5. Paper and Pulp	28·30	8·00
6. Iron and Steel	18·00	15·00
7. Hard Board	2·2	...
8. Tea Garden	6·5	0·5
9. Oil Refinery	5·0	1·5
10. Rayon	10·0	...
11. Chemical Industries	10·00	3·5
12. Petro Chemical	10·00	...
13. Dockyard/Shipyard	6·00	1·0
14. BSIC and Medium Size Industries	2·5	1·5
15. Railways	2·5	1·0
16. Rural Electrification	2·5	1·0
17. Domestic and Commercial	66·0	28·0
18. FIDC	5·0	0·7
19. WASA	10·25	3·0
20. Irrigation and Drainage	54·50	7·0
21. Other Industries and miscellaneous ...	47·50	14·0
	449·10	135·4
Actual Peak demand 1964	88·00	88·0
	537·10	223·4 MW
Expected Peak demand allowing D.F. and losses.	500·00	...
Industries having own generation	40·00	40·0
Total ...	540 MW	263·4 MW

Annexure III

GROWTH BASED ON HISTORICAL TREND

In the early 60's both peak demand and energy consumption increased at a rate of 17-18 per cent in both East and West Zone, which dropped to 15-16 per cent in the late 60's. In the load forecast based on historical trends shown below the lower annual growth rate of 16 per cent has been assumed. It may be pointed out here that WAPDA achieved a peak demand of 170 MW in the East Zone and 53 MW in the West Zone in late 1970. The industrial consumption of electricity was about 70 per cent, commercial 15 per cent, domestic 10 per cent and agriculture 5 per cent of the total consumption. Although during the period of the liberation war the total peak demand dropped sharply, a total peak demand of 225 MW has been realized by June, 1973. To estimate the likely peak demand at the end of the plan period, the peak demand of 167 MW in the Eastern Zone and 55 MW (including 10 MW of suppressed load) in the Western Zone have been increased at a compound annual growth of 16 per cent and additional peak load due to central pumping stations and rural electrification have been added. The total peak demand thus stands at 517 MW assuming load demand due to tube-wells and low-lift pumps to be operated at off peak hours.

PEAK DEMAND AND ENERGY CONSUMPTION BASED ON HISTORICAL GROWTH RATE OF 16 PER CENT PER YEAR

(Excluding Agricultural Loads)

Year.	East Zone.		West Zone		Total.	
	Peak MW	Energy. $10^6 \times$ KWHR	Peak MW	Energy. $10^6 \times$ KWHR	Peak MW	Energy. $10^6 \times$ KWHR
1973 ..	167·0**	850·0	*55·0	*280·0	222·0	1130·0
1974 ..	193·7	986·0	63·8	324·8	257·5	1310·8
1975 ..	224·7	1143·8	74·1	376·8	298·8	1520·6
1976 ..	260·7	1326·8	86·0	437·0	346·7	1763·8
1977 ..	302·3	1539·1	99·7	506·9	402·0	2046·0
1978 ..	350·7	1785·3	115·6	588·0	466·3	2373·3

*Actual non-agricultural peak-load in 1973 was 45 MW and 8 MW agricultural load. Another 10MW has been added to compensate the suppressed load in that zone.

**3 MW has been taken as agricultural load.

Note : (i) It is assumed that energy consumption in 1973 would be 1130 million kwhr by excluding the agriculture load and including the suppressed demand.

(ii) To find total (agril. and non-agril.) peak-load and energy consumption in 1978 irrigation and rural load of 51 MW and 345 million kwhr respectively should be added to the figures above which stands at 517 MW and 2718 million Kwhr.

Annexure IV

GROWTH BASED ON INVESTMENT PROGRAMME

An attempt has been made to estimate peak demand of power at the end of the First Five-Year Plan based on investment made in the Industrial and Agricultural Sectors. It has been assumed that the Industrial Sector will launch a programme for Taka 880 crores during the first Five-year Plan. It has also been assumed that 8000 tube-wells (deep and shallow) and low-lift pumps of BADC, 2440 deep tube-wells and several Central Pumping Stations of BWDB will be electrified during the period. While estimating power requirement for industries rate of 1 MW/TK. 3 crores of investment has been taken in lieu of earlier estimates of 1 MW/TK. 1 crore of investments. Additional peak power requirement of 50 MW for urban, domestic and commercial categories and a 10 MW load for rural electrification including cottage industries has been estimated.

Annexure IV-a

ESTIMATED PEAK DEMAND FOR 1978 BASED ON INVESTMENT PROGRAMME

Sl. No.	Name of the Project.	Nos. to be electrified.	Connected load.	Additional peak demand	
				Tube-wells and low-lift pumps if operated during peak hour.	Tube-wells and low-lift pumps if operated at off-peak hour.
1	Water Development Board—				
	(a) Pumping Stations		..	29·00	29·00
	(i) Pabna Project		9·60 MW	..	..
	(ii) Khowai Project	Gravity	...	..	..
	(iii) Belkuchi Project		9·00 MW	..	..
	(iv) Monu River Project		2·00 MW	..	..
	(v) Gumti F/C Project		0·58 MW	..	..
	(vi) Comprehensive Drainage Scheme (Noakhali) ..		5·00 MW	..	..
	(vii) Chandpur Irrigation Project		3·00 MW	..	..
	(viii) Tista Project		5·00 MW	..	..
	(ix) Meghna-Dhenagoda Project		5·00 MW	..	..
	(x) Little Feni River Project		2·00 MW	..	..
	(xi) Muhuri River Project		2·50 MW	..	..
	(xii) Karnafulli Irrigation Project		4·00 MW	..	..

Annexure IV-a—*Continued.*

Sl. No.	Name of the Project.	Nos. to be electrified.	Connected load.	Additional peak demand. Tube-wells and low-lift pumps if operated during peak hour.	Additional peak demand. Tube-wells and low-lift pumps if operated at off-peak hour.
	(xiii) Dacca City Project		4·00 MW	..	..
	(xiv) Upper Kushiara Project		1·00 MW	..	..
	(xv) Small Electric Pump Irrigation Project		5·00 MW	..	..
	(xvi) Small F/C and Irrigation Project		0·30 MW	..	..
			57·98 MW		
(b)	Deep Tube-wells		..	39·30	..
	(i) Tentulia-Panchagarh Tube-well Project	540	15·30 MW	..	..
	(ii) Thakurgaon Tube-well Extension Project	300	9·00 MW	..	..
	(iii) Rangpur Tube-well Extension Project	300	9·00 MW	..	..
	(iv) One thousand Tube-well Project (Rangpur, Bogra).	1000	30·00 MW	..	..
	(v) Other deep Tube-well Projects	300	15·30 MW	..	..
			78·60 MW		
2.	BADC—				
	(i) Deep Tube-well (Total 19,500 Nos.)	4000	80·00 MW	60·00	..
	(ii) Shallow Tube-well (Total 15,000 Nos.)	2000	20·00 MW	..	..
	(iii) Low-lift Pump (Total 45,000 Nos.)	2000	20·00 MW	..	..
3.	Industries—				
	(1 MW/TK. 3 crore of investment) 880 crore taka total investment.		293·00 MW	234·00	234·00
4.	Domestic and Commercial—				
	(i) Urban		100·00 MW	50·00	50·00
	(ii) Rural Electrification		15·00 MW	10·00	10·00
				422·29	323·00
Additional peak demand allowing for diversity and losses				388·00	294·00
Peak demand so far achieved				223·00	223·00
Total Peak demand expected at the end of 1st Five-Year Plan				611·00	517·00

Annexure IV-b

ESTIMATED CONSUMPTION OF ELECTRIC ENERGY IN 1978 BASED ON INVESTMENT PROGRAMME

Sector.	Connected load MW	Peak load MW	Average hours of operation/year	Energy requirement mkwh.
A. Irrigation:				
(a) WDB Pumping Station ..	55·48	29·00	12 hrs./day for 90 days and 6 hrs./day for 30 days.	69·7
(b) Deep Tube-wells (6440 Nos.) ..	158·60	79·30	12 hrs./day for 90 days.	171·30
(c) Shallow Tube-wells (2000 Nos.)	20·00	10·00	Ditto	21·6
(d) Low-lift Pumps (2000 Nos.) ..	20·00	10·00	Ditto	21·6
Total Irrigation ..	254·08	..	..	284·20
B. Industries:				
Based on taka 880 crore investment ..	293·00	234	*60 % Y.L.F.	1230·00
C. Urban Development and Commercial	100·00	50	Ditto	264·00
D. Rural Electrification Programme .. (including Cottage Industries).	15·00	10	6 hrs./day	32·85
Grand Total ..	711·08	..	..	1811·00
Present position ..	..	..	..	1130·00
Total in 1978 ..	..	..	..	2941·00
			Say	2940·00

*Since most of the industries installed during the FFYP may not run at full capacity (three shift) for the initial years, yearly load factor may be assumed to 50 per cent for the new industries instead of 60 per cent for existing system. In that case, energy consumption during 1978 will be 2735·00 million KWH.

Annexure V

GROWTH BASED ON POPULATION RELATED EQUATION

Briefly, the population related equation method involves the utilization of an empirical formula based on time series data from 97 countries which relates the annual load growth in percentage to the annual energy usage in KWH *per capita*. Given the current population of a country and the annual rate of population growth the formula will forecast energy consumption. To obtain a forecast of peak demand in MW it was assumed that the yearly load factor would not continue to increase in accordance with the past trend, due to the addition of considerable amounts of pumping load at low load factor (about 20 per cent), would remain at the present value of just under 60 per cent. Since the available data show similar energy trends for the Eastern and Western Grids, the same rate of growth was assumed for each. The same load factor was also assumed for each grid, with the result that the assumed percentage growth rates for peak demand on each grid are identical. The load growth projections by this method are shown below.

LOAD FORECAST BASED ON SCHEER'S FORMULA

Scheer's Formula : $g=\frac{10^c}{U^{0.15}}$ where

g=Percentage Energy growth per year.

c=1·33+0·02P.

P=Average population growth rate.

U=Energy consumption/capita in kwh.

Population in January, 1973 $=74\times10^6$

Energy consumption/year $=1440\times10^6$ kwh

Per capita energy consumption, U. =19·6 kwh

Population growth rate, p =3·0

c=1·33+0·02P =1·39

$g=\frac{10_c}{U^{0.15}}-\frac{10^{1.39}}{19\cdot6^{0.15}}$ =15·6

Year.	Energy consumed in million Kwhr.				Peak Load in MW.		
	East Zone.	West Zone.	Outside PDB.	Total.	East Zone.	West Zone.	Total.
1973	850	280	310	1440	170	53	223 (actual)
1974	982·6	323·7	310	1616·3	186·95	61·59	248·54
1975	1135·9	374·2	310	1820·1	216·11	71·20	287·31
1976	1313·1	432·6	310	2055·7	249·82	82·31	332·13
1977	1517·9	500·1	310	2328·0	288·79	95·15	383·94
1978	1754·7	578·1	310	2642·8	333·84	110·00	443·83
					Say, 334·00		Say, 444·00

Note—(i) It is assumed that energy consumption in 1973 would be 1130 million Kwhr by excluding the agricultural load and including the suppressed demand.

(ii) By 1973 additional peak load of 51 MW (irrigation 41, new and existing, rural electrification 10 MW) will be added to the system. Thus total peak load will be 495·0 MW, total consumption will be 2677·8 million Kwhr (including 345 MKWhr for irrigation & R.E.P) for the Power Development Board system.

Annexure VI

GENERATING CAPACITIES EXISTING

Eastern Zone.		Western Zone.	
GRID:		GRID:	
1. Kaptai	80 MW	1. Goalpara SPS	16·64 MW
2. Siddhirganj	80 MW	2. Goalpara DPS	7·80 MW
3. Siddhirganj Diesel ..	10·75 MW	3. Goalpara GTPS ..	24·00 MW
4. Ashuganj	128 MW	4. Goalpara RMPS ..	6·50 MW
5. Shahjibazar	101 MW	5. Bheramara SPS ..	8·00 MW
6. Chittagong GTPS ..	13 MW	6. Smaller Stations	11·60 MW
7. Chittagong Diesel ..	10·7 MW		
8. Smaller Stations ..	6·2 MW		
Total ..	429·65 MW	Total ..	74·54 MW
Isolated ..	9·65 MW	Isolated ..	31·18 MW
Eastern Zone Total ..	439·30 MW	Western Zone Total ..	105·72 MW
Total Existing Capacity ..	545 MW		

Incoming

Eastern Grid.		Western Grid.	
1. Ghorasal	110 MW	1. Khulna	60 MW
2. Kaptai	50 MW	2. Bheramara	60 MW
3. Chittagong	60 MW	3. Khulna	100 MW
		4. Saidpur	11 MW
Total ..	220 MW	Total ..	231 MW
Total Incoming capacity ..	451 MW		
Total Existing capacity ..	545 MW		
Grand Total ..	996 MW		
A. Eastern Zone	..	660 MW	
B. Western Zone	..	336 MW	
Total ..		996 MW	

Annexure VII

BREAK UP OF PDB SYSTEM PEAK LOAD, 1970

Eastern Zone.

GRID	
Kaptai	35·00 MW
Siddhirganj SPS	15·30 MW
Siddhirganj 50 MW ..	32·00 MW
Shahjibazar	56·40 MW
Chittagong DPS	0·50 MW
Ashuganj	27·00 MW
Feni	0·66 MW
Total ..	166·86 MW
ISOLATED	
Mymensingh	1·73 MW
Jamalpur	0·50 „
Kishoreganj	0·19 „
Cox's Bazar	0·28 „
Netrakona	0·15 „
Ajmiriganj	0·04 „
Sunamganj	0·12 „
Total ..	3·01
GRAND TOTAL ..	223·91MW,
Say ..	223 MW.

Western Zone.

GRID	
Goalpara SPS	10·20 MW
Goalpara GTPS	20·20 „
Goalpara DPS	3·00 „
Goalpara RMPS	3·6 „
Bheramara SPS	1·50 „
Rajshahi	2·00 „
Sirajganj	2·09 „
Jessore	0·35 „
Total ..	42·94 MW
ISOLATED	
Thakurgaon	4·15 MW
Satkhira	0·30 „
Bogra	2·92 „
Rajbari	0·33 „
Barisal	1·59 „
Chapai Nawabganj ..	0·18 „
Kurigram	0·09 „
Gaibandha	0·29 „
Bhola	0·13 „
Joypurhat	0·09 „
Meherpur	0·10 „
Patuakhali	0·91 „
Jhalakathi	0·02 „
Total ..	11·10 MW

Annexure VIII

SUMMARY SHEET OF FIRST FIVE YEAR PLAN POWER PROGRAMME

(1973-74 to 1977-78)

(*Taka in crore*)

	Total.	Foreign Exchange.	Percentage of Grand Total.
1. Generation	63·194	31·209	15·00
2. Primary Transmission	40·288	15·515	9·50
3. Secondary Transmission and Distribution ..	267·260	126·285	63·00
4. Miscellaneous	52·811	27·831	12·50
Grand Total ..	423·553	200·840	100·00
Say ..	423·500		
Part-I: Reconstruction and Rehabilitation:			
1. Generation	5·576	2·831	
2. Primary Transmission	0·484	0·169	
3. Secondary Transmission and Distribution ..	17·358	7 888	
4. Miscellaneous	—	—	
Total ..	23·418	10·888	
Part-II: On-going Schemes:			
1. Generation	34·418	17·878	
2. Primary Transmission	21·254	7·697	
3. Secondary Transmission and Distribution ..	41·402	18·897	
4. Miscellaneous	13·673	9·145	
Total ..	110·747	53·617	
Part-III: New Schemes:			
1. Generation	23·200	10·500	
2. Primary Transmission	18·550	7·650	
3. Secondary Transmission and Distribution ..	208·500	99·500	
4. Miscellaneous	39·139	18·686	
Total ..	289·389	136·336	

PHYSICAL TARGETS:

Annexure IX

		Estimated Achievement during Plan.	Position by the end of F. F. Y. P.
A.	Installed Capacity	451 MW	996 MW*
B.	Transmission Line	563 miles	1,210 miles
C.	Distribution Line .. .. .. 33 KV	1888 miles	3,130 miles
	11 KV	10,622 miles	15,000 miles
D.	Pumps (Electrification)	10,240 Nos.	10,740 Nos.
E.	Village Electrified	1,000	1,250

*Some of the old generating units may be retired during the Plan Period.

11.2. NATURAL RESOURCES

11.2.1 History of Development of Natural Resources

In the pre-liberation period there were no full-fledged establishments for Geological Survey, Oil and Gas Development etc., in Bangladesh. Only a few small scale field offices were located here such as the Eastern Regional Office of the Geological Survey in Dacca and the Oil and Gas Development Corporation in Chittagong. The interests of Bangladesh were inevitably neglected under such a set-up.

We have only inadequate information about the geological environment, but the prospects of discovering economic and strategic minerals or mineral deposits seem bright. A promising resource potential has been established, part of which is in use and the rest awaits economic evaluation and development.

A. *Rocks and Minerals*

Investigations carried out by the GSB have revealed the existence of the following rocks and minerals in Bangladesh:

(i) *Coal deposits in Jamalganj area*—Enormous deposits of Coal, totalling a thickness of about 140 feet, were discovered in the Jamalganj area of Bogra and Rajshahi districts in 1963. The mineable reserve of coal in the area is estimated to be 700 million tons at the minimum. A scheme for the development of Jamalganj Coal is under examination of the Government. Recent estimates show the reserve to be as high as 1,600 million tons which in heating value is equivalent to about 4·6 times the gas reserves of Bangladesh. However, its presence at depths under alluvium of about 2,700—3,000 feet requires the use of sophisticated and costly mining techniques. Exploitation of this source may not be expected before 1980.

(ii) (a) *Lime-stone deposit of Jamalganj-Jaipurhat area*—An extensive deposit of lime-stone, discovered in 1963 is about 80 feet thick and lies about 1,600 feet below the surface. The estimated mineable reserve is 200 million tons. A development scheme has already been drawn up for mining of lime-stone and setting up a Cement Plant.

(b) *Lime-stone of Takerghat, Sylhet*—The deposit was discovered in 1950-51 and it ranges from 30 to 200 feet in thickness. The estimated reserve is 3 million tons. On average, one hundred and thirty thousand tons of lime-stone are being mined per year for the Chhatak Cement Factory.

(c) *Lime-stone of St. Martin's Island, Chittagong*—The deposit was discovered in 1960. The estimated quantity of the deposit is 1·8 million tons which still remains unused.

(iii) *White Clay deposits of Bijoypur, Mymensingh*—The deposit was discovered in 1957 and it ranges in thickness from 8 to 14 feet with an average of 10 feet. The estimated reserve of the clay is about 0·2 million tons which is being utilised by almost all the ceramic industries of the country.

(iv) *Glass Sand deposits of Shahjibazar-Noyapara in Sylhet.*—The deposit was discovered in 1950. The workable reserve of glass sand in this area is about 0·4 million tons. The sand is being utilised by the glass industries of Bangladesh. Recently some more glass sand deposits in the districts of Sylhet and Chittagong have been discovered, and they are being utilised.

(v) *Hard Rocks of Ranipukur in Rangpur District*—The deposit was discovered in 1966. Large quantities of hard rocks (igneous and metamoraphic) are present at about 500 feet below the surface in the Ranipukur area of Rangpur district. These rocks when mined can be used for construction of roads, bridges, dams, heavy buildings and many other engineering structures. Rocks at lower depths indicates the possibilities of finding economic mineral and metallic ore deposits along the fault and fracture zones. The basement complex warrants a thorough search.

(vi) *Beach Sand Mineral Deposit.*—The placer concentration of heavy minerals of the Cox's Bazar Beach Sand contain a substantial amount of strategic minerals such as monazite and zircon along with rutile, ilmenite, and magnetite etc. The Atomic Energy Commission (AEC) in close co-operation with the Australian Government, is actively planning to set up a pilot plant at Cox's Bazar in connection with the exploitation of minerals from beach sand.

B. *Oil*

(a) Till 1947 the only worthwhile exploratory work was done by Burmah Oil Company (B.O.C.) and its predecessor White Hall Potroleum Company. Subsequently the work was activised by STANVAC & Shell Oil Company respectively. As a result, the following structures in areas mentioned below were identified and exploratory works were carried out by various oil companies.

(i) Patia, Chittagong	B.O.C.
(ii) Patharia, Sylhet	
(iii) Sitakund, Chittagong	White Hall Petroleum Company.
(iv) Hazipur (Modhupur), Tangail ..	STANVAC.
(v) Kuchma and Bogra	Ditto.
(vi) Kailas Tilla, Rashidpur, Habiganj, Titas and Bakhrabad.	Shell Oil Company.
(vii) Tangra Tilla, Haripur, Sylhet ..	B.P.L. (Bangladesh Petroleum Ltd.).

(b) During the last two decades, particularly during 1955—65, a considerable part of the prospective areas was covered with surveys of varying detail leading to drilling and discovery of commercial reserves of gas in almost all the structures mentioned at sl. vi & vii above.

(c) The OGDC was established in 1961 for conducting exploration, development, production, refining and marketing of oil and gas resources in the public Sector. The Government of the USSR provided technical know-how and equipment financed out of special Soviet loan.

Actual work under this assistance started in 1962. Extensive geological, including geomorphological, aeromagnetic and other geophysical studies were begun. Based on earlier information and the USSR expert's deductions, drilling of 4 deep and 4 relatively shallow wells were carried out at Jaldi and Semutang. One well at Semutang showed occurrance of gas and one well at Jaldi is at the final stage of production testing.

(d) Cumulative efforts of various private oil company's and OGDC led to the identification of some more structures as follows :

(i) Jaldi, Chittagong—Drilled up to 4500 Meter and has a possibility of the presence of Gas. Production testing of one well is being undertaken.

(ii) Semutang, Chittagong—Gas has been found but the present available reserve is inadequate for commercial exploitation.

(iii) Olah Taung, Gobamura, Sitapahar, Chittagong Hill Tracts.

(iv) Inani, Dakhin Nhila, Chittagong.

(v) Lalmai, Daud Kandi, Comilla.

(vi) Begumganj, Noakhali.

(vii) Muladi (Hizla), Barisal.

(viii) Patuakhali.

(e) So far, only two structures (Jaldi & Semutang) have been drilled by OGDC but lower and probably more prospective horizons have remained untested in both the places. The reasons for not drilling deeper horizon could be many. These could probably include lack of appropriate technical interpretation, international petroleum politics, lack of interest of the erstwhile colonial government for Bangladesh, foreign oil Companies interest in the leased area *vis-a-vis* their global interest. Although 'Oil Shows' have been recorded in one or two exploratory wells no discovery has at yet been made. It is not unlikely, however, that the continued exploration may succeed in locating oil in this vast sedimentary basin of Bangladesh.

(f) The task of exploration of oil & gas requires huge risk capital and expert services. In view of the importance of oil in an economy, the First Plan envisages on a priority basis exploration activities partly under OGDC and partly through foreign oil companies. The off-shore exploration is more ardous and expensive. Earlier Shell Oil Company drilled one well at Cox's Bazar. Although the result of that drilling was not very encouraging, prospective structures for drilling may be discovered in the Bay of Bengal.

(g) Recently a group of experts from the Ministry of Geology, USSR, after their visit during February-March 1973, submitted a recommendation for 1973-75 in which they have divided the areas of petroleum prospecting into three zones as under :

(i) Bengal basin underlies thick series of sedimentary deposits which may have bright prospects for oil and gas. A number of structural units of possible potentiality such as Barisal-Chandpur-Daudkandi uplift zone, Khulna and Madhupur uplift zone have been identified by geophysical and geomorphological studies. None of these structures have been drilled.

(ii) The platform slope, the continuation of the Indian Platform meets the basin on the West and North along the Calcutta-Pabana-Hazipur hinge line. The experts reckon that the hinge line is of interest for Petroleum exploration because of the possibility of reef deposits in this area.

(iii) The folded flank constitutes en-echlon folds of Sylhet, Comilla, Noakhali and Chittagong. In these areas except for a few, most of them have cropped out on the surface as intensive tight folds. In this zone natural gas has already been discovered.

C. *Gas*

Seven gas fields have so far been discovered. Of them four fields are producing gas while the fields at Bakhrabad, Kailastila and Rashidpur are yet to be exploited. The total proven reserve is between 8 to 9 million million cubic feet shown in Table XI-1 and possible reserves from the same fields may be of the order of 17 million million cubic feet.

TABLE XI-1

Gas Reserves in Bangladesh.

Field.	Proven Reserve (in million million cft.).	Quality (Methane. percentage).	Condensate recovery BBL/10^6 cft.	Calorific value Gross BTU/cft.	Mercaptan Sulphur Grains/ 100 cft.	Year of discovery.
1. Sylhet ...	0·28-0·43	95·49	3·7	1052	0·29	1955
2. Chhatak ...	0·04	99·05	Trace	1007	Nil	1959
3. Rashidpur	1·06	98·020	0·3	1014	Nil	1960
4. Kailas ...	0·60	95·70	10·0	1050	Nil	1962
5. Titas ...	2·25	96·90	1·7	1036	Nil	1962
6. Habiganj ...	1·28	97·80	0·05	1020	Nil	1962
7. Bakhrabad	2·78-3·70	94·03	2·0	1022	Nil	1963
Total ..	8·29-9·36					

8. Jaldi—Production testing is being undertaken.

9. Semutang —Approximately 0·03 million million cft.

(ii) For many years, the use of gas was confined mainly to the Fenchuganj Fertilizer Factory and the Chhatak Cement Factory. For Power generation, gas was first taken to Shahjibazar in the year 1968-69 from the Habiganj Gas field. Large scale use of natural gas for diversified uses as generation of power, industrial, commercial and domestic uses commenced in 1968 after the discovery of the Titas Gas Field and the establishment of the Titas Gas Transmission and Distribution Company in 1964. The Company took up a development scheme for implementation in the year 1964 at a cost of Taka 10·25 crores with a F.E.C. of Taka 3·66 crores. As regards physical progress, the company has ensured supply to the consumers by restoring the gas supply from Titas field through two 6" and 4" temporary pipelines across the Meghna. Preparations are in progress for completing the 14" gas pipeline along the Bhairab bridge. The progress made by TGTD Co. during the year 1972-73 is shown in Table-XI-2.

TABLE XI-2

Physical Progress of TGTD Co.

	Total mileage of pipe line laid.	Off-take in million cft/day.	No. of consumers.			
			Industry, Power and Fertilizer.	Commercial	Domestic	Total
Prior to Liberation	214	21	39	41	1655	1735
Addition during 1972-73.	12	34	35	104	2481	2620
Total ...	226	55	74	145	4136	4355

(iii) The quality of gas in Bangladesh is one of the purest as the percentage of total hydrocarbon remains always over 94% thus keeping the calorific value comfortably over 1000 BTU/cft. Costly purification plants are not needed but absence of impurity also precludes possibilities of diversified manufacture. The economic use of primary energy source for various purposes has a profound bearing on the country. Therefore, it is necessary to evaluate the costs and benefits of the alternative uses of energy sources to ensure its optimum use. For the earlier period (*i.e.*, possibly before 1980) natural gas is the only available economic energy source in the country.

(iv) At present the main users of gas are NGFF/Fenchuganj (10MMCFD)[1], UFF/Ghorashal (35MMCFD), CCF/Chhatak (5MMCFD), Siddhirganj Power Station (11MMCFD), Ashuganj Power Station (15MMCFD), Shahjibazar Power Station (16MMCFD), other industries (3·5 MMCFD), and Commercial and Domestic consumers (0·15MMCFD). More varied use may be found with the establishment of a petrochemical complex and a fertilizer factory.

(v) According to a frequently used rule of thumb for determining the maximum production rate, a gas field which can support, one trillion cu. ft. of recoverable reserve would justify a 20-year plateau rate of 100 million cu. ft./day. Therefore, excluding the small Chhatak and Sylhet fields, Bangladesh has enough reserves to support a production rate of 800 million cu. ft./day for 20 years. At present the total utilization of natural gas in Bangladesh is only

[1] MMCFD– Million Cubic Feet per day.

about 96 million cu.ft./day. Assuming a growth rate of 10 per cent per annum, the total requirement of Bangladesh till the year 2000 comes to about 4·0 million million cu.ft. Therefore Bangladesh would still have sufficient reserves to either export gas or use it locally at the rate of 400 million cu.ft./day for at least another 20 years. There should, therefore, be more use of gas along with attempts to find more gas reserves in areas, in the land and off-shore, which are yet to be explored. In the past the success rate of wild-cat wells in the on-shore of Bangladesh has been exceptionally good.

(vi) Out of the proven reserves of 8·29—9·36 million million cft. roughly 33 per cent would support 2250 MW of capacity over a period of 30 years at an average plant factor of 50 per cent. If 45 per cent of the reserve is deployed for power, the gas would support about 3200 MW of gas fired capacity over its economic life (30 years at 50 per cent plant factor). This may be seen in the perspective of a power generating capacity target of 996 MW by 1978, *i.e.*, at the end of the First Plan.

(vii) On the basis of another exercise the gas consumption projection up to 2000 may be seen in Table XI-3.

TABLE XI-3

Estimated Gas Usage in Bangladesh.

Categories.	Dispensed Usage.						
	1970	1973	1975	1978	1980	1985	2000
Power ...	45	40	100	100	100	200	700*
Fertilizer ...	23	48	100	150	150	190	230
Petrochemical ..	...	...	...	...	75	100	125
Cement ..	0·25	5	5	5	18	18	18
Pulp and Paper ..	...	...	3	3	62	92	92
Big and Medium Industries.	2	2	20	23	50	80	100
Cottage, Small Industries.	...	...	2	2	5	10	30
Commercial/Domestic uses.	1	1	5	5	10	15	25
Agriculture ..	..	..	..	..	10	25	25
Total Daily consumption.	71·25	96	235	288	480	730	1345

Total Consumption by 2000 will be far less than total proven reserve.

*700 million cft. of gas per day can support 5000 M.W. gas fired steam generating station at 60 per cent. Plant factor.

D. *Eastern Refinery Limited (ERL)*

(a) The Eastern Refinery Limited was set up at Chittagong in 1967 with an installed capacity to process 1·5 million tons of crude oil per year at a gross investment of US$ 34 million. The plant was originally designed to process low sulphur Agajari crude from Middle East sources, but it was later decided to process Agajari and Murban in the ratio of 60:40 in order to have flexibility in crude purchase and produce more of the middle distillates, *i.e.*, JP-1/JP-4, SKO, IKO, HSD, MS, etc., which were in high demand in the country. It went into production in May, 1968, and till December, 1972 about 3·7 million tons of crude were processed.

(b) This post-liberation crude oil charge rate represented about 50 per cent. of the rated plant designed capacity per year. The unusually low utilization factor was due to a variety of reasons including:

(i) Disruption in delivery of crude supplies from traditional sources.

(ii) Non-availability of crude oil at preferred prices.

(iii) Excessive capital related charges.

(iv) Operations at less than full capacity.

(v) Absence of clear lines of authority in the management of ERL.

(vi) Absence of adequate Jetty facilities for crude intake.

(vii) Failure to repair the off-shore Oil Terminal (OSOT) outside Chittagong Port. The OSOT built for the purpose of loading/unloading has seldom functioned properly since installation of the single bouy mooring (SBM) in 1968. Since commissioning ERL has received over 3·5 million tons of crude without the services of OSOT and for that the country incurred lighterage charge of over Taka 350 lakhs. The repair or installation of a new OSOT will mean annual saving in foreign exchange of about Taka 295 lakhs at the minimum.

(c) Extension and improvement in the performance of the refinery will depend on the removal of these difficulties and bottlenecks and addition of new processing facilities or change in existing facilities so that the refinery has sufficient flexibility in processing high sulphur crude. It has also to be ensured that all by-products of the refinery are utilized to the best economic advantage of the refinery.

(d) Figures below (Table XI-4) shows ERL output and Table XI-5 shows the type of crude handled during 1969-72:

TABLE XI-4

ERL Production for the year 1969—72. *(All figures in tons)*

Product	1969	1970	1971	1972
Naptha	56,546	28,309	40,667	36,363
M. S.	64,788	62,957	43,172	41,870
HOBC	1,974	4,246	1,719	2,853
JP-1	12,668	34,131	25,784	6,283
JP-4	4,544	5,856	2,726	2,749
SK	1,52,891	1,63,461	1,45,206	1,55,793
I K	1,17,169	39,732	44,316	5,186
HSD	85,443	87,954	53,025	67,771
LDO	7,254	10,807	29,076	32,894
JBO	14,422	56,175	41,450	41,461
FO (HS)	3,74,421	3,25,759	3,03,258	3,12,884
FO (LS)	23,270	18,853	16,897	25,573
SBP	..	128	148	120
MTT	..	24	239	531
Total ..	9,13,410	8,18,392	7,45,685	7,32,331

TABLE XI-5

Crude Trade *(All in tons)*

Type of Crude.	1968.	1969.	1970.	1971.	1972.
Aghajari	2,50,547	5,60,915	4,28,682	4,53,446	3,67,491
Light Arabian/Heavy Arabian, Rustum, Sepecial Arabian, Arab mix.	...	...	...	32,977	2,47,382
Murban	...	4,04,293	4,64,570	3,08,090	2,02,433
Titas Condensate ...	...	...	300	329	1,902
BPI. Condensate from Sylhet Gas field.	...	..	600	600	600
	2,50,547	9,65,208	8,94,152	7,95,442	8,19,808

(e) In Table XI-6 below is presented ERL's production Plan of some major middle distillates and the country's requirement of POL products and probable deficit between July 1973 to June 1974.

TABLE XI-6

(All figures in tons)

ERL Production Plan

POL products.	Country's Requirement estimate	ERL Production estimate	Deficit (to be imported)
AV. Gas 100/130	1,100	...	1,100
ON 73	200	...	200
JP-1	34,000	15,000	19,000
JP-4	600	600	...
HOBC	4,180	...	4,180
MS	80,330	52,500	27,830
SKO	4,05,000	1,57,500	2,47,500
IKO	2,45,000	...	2,45,000
HSD	1,87,000	80,250	1,06,750
LDO	62,000	25,500	36,000
FOHS	5,55,000	5,10,000	45,000
	15,74,410	8,41,350	7,33,060

The impact of the deficit will be felt more acutely, when the plant will be shut down for servicing in the 4th quarter of 1973. Hence, it is imperative that stocks should be built up well in advance.

In view of the continuously deteriorating condition of the refinery, the reserve stock should be 25 per cent more than the estimates of the deficit requirements given in Table XI-6.

(f) The long term requirements of POL up to 1978, are presented in Table XI-7. The fast rising prices of both crude and POL are due to the recent energy crisis in USA and the heavy buying by both USA and Japan. The oil exporting countries are also trying to secure higher revenues for themselves. Bangladesh will have to study these developments and seek solutions not only through a carefully planned procurement strategy but through development of relationships with the oil exporting countries, well in time.

TABLE XI-7

Long Term Estimates and Projection of POL Products

[All figures in tons]

Products.	1970.	1971.	1972.	1973.	1974.	1975.	1976.	1977.	1978.
Av. Gas 80/87 ..	304	320	105	300	500	500	500	500	500
73-ON ..	58	61	85	150	200	200	200	200	200
100/130 ON ..	162	74	942	1,500	1,100	2,000	2,000	2,000	2,000
JP-1	40,175	33,097	13,606	31,000	34,100	37,500	41,250	45,500	50,000
JP-4	6,715	4,718	2,379	600	600	600	600	600	600
HOBC ..	3,180	1,837	2,421	3,800	4,180	4,600	5,100	5,600	6,200
MS	67,775	42,218	51,644	72,300	80,330	90,000	95,500	105,000	120,300
SKO	212,534	166,746	231,171	372,000	405,000	425,000	445,000	490,000	540,500
IKO	200,970	117,063	32,812	228,000	245,700	255,500	280,000	300,000	330,400
HSD	96,004	67,005	112,679	170,000	187,000	206,000	226,000	249,000	274,000
LDO	58,814	34,913	31,741	57,000	67,700	69,000	76,000	84,000	92,400
FOHS ..	465,139	293,486	272,935	505,000	555,000	611,000	672,000	739,000	813,000
JBO	43,732	31,115	36,655	48,000	52,800	58,100	64,000	70,500	77,500
SBP	276	134	102	300	400	2,000	5,000	7,500	10,000
MTT ..	458	205	141	500	1,200	1,500	2,000	2,500	3,000
LUBS ..	17,653	8,829	7,863	18,000	20,000	22,500	25,000	28,000	32,000
GREASE ..	471	208	136	500	500	750	750	1,000	1,200
BITUMEN ..	1,099	325	..	50,000	60,000	75,000	85,000	100,000	120,000
WAX ..	55	67	..	200	300	500	750	1,000	1,200
FOLS ..	21,816	14,947	20,383	30,300	33,330	37,000	41,000	4,500	49,000
NAPTHA ..	42,932	33,535	42,833	40,500	44,550	49,000	54,000	59,000	65,000
	1,280,322	850,904	860,633	1,629,950	1,789,990	1,850,250	2,122,200	2,325,900	2,590,000

11.2.2 Plan Objectives and Policies

A. *Objectives*

(i) To remove the imbalance between the gas discovered so far and the transmission and distribution facilities.

(ii) To initiate, on a priority basis, exploration of oil and gas.

(iii) To accelerate surface and sub-surface geological investigation and mapping.

(iv) To reorganize and develop institutional facilities including physical facilities of the concerned agencies.

(v) To impart training to improve technical capabilities of the professionals.

B. *Policies*

(i) Emphasis will be placed on the use of gas as fuel for domestic, industrial and commercial purposes in the urban areas.

(ii) Arrange optimum use of gas for generation of power.

(iii) Exploration, development and marketing of oil and gas should be treated as an integrated function. The task should be the responsibility of a single corporation.

(iv) Duality of authority between the Ministry of Industries and the Ministry of N.R. & S.T.R. should be eliminated.

11·2·3 Plan Strategies

A. Exploration for Petroleum has been identified as an ardous and expensive process. The following steps are suggested in this connection :

(a) All reasonable measures should be taken to attract the large, high risk investment that such ventures will require.

(b) Necessary technical expertise may need to be obtained from outside. A local infra-structure will be developed to sustain petroleum exploration and the following will be required :

(i) Delineation of specific areas for gas/oil prospecting will be difficult without sufficient laboratory tests and research. Full-fledged facilities in this respect will be set up.

(ii) Without geo-chemical studies indications of petroleum prospects on certain geological formations are difficult to obtain. Oil and Gas Development Corporation should create facilities for such studies.

(c) Details of data for the areas of confluence of two or more structural zones are not available. Exploration should now be taken up in these areas. Necessary studies should be undertaken to see if scope for deep drilling exists.

(d) Geological and geophysical studies for oil lease cover a very limited area of Bangladesh. The southern or south-western part including north Bengal received almost no attention. The Barisal structure has been recommended by USSR experts for drilling for its size and very gentle attitude of beds and nearness to the industrial areas of Khulna and Jessore. If oil/gas is discovered in commercial quantities in this area the consumption would not only resolve the energy crisis in the Western Zone but will also save substantial investments on long distance transmission lines from the east. For this it is proposed that the Rig lying at Semutang in Chittagong be moved to Muladi in Barisal.

(e) Geologically, the eastern part of Bangladesh is closely linked with the Assam-Arakan Petroliferous region and there is no reason to believe that oil may not be discovered here. The Oil and Gas Development Corporation's exploration were confined mainly to Chittagong, Sylhet and some southern districts. In the plan period the Corporation will initiate exploration activities on a number of geological structures so far identified.

(f) The possibility of off-shore oil prospecting may also be examined. But resource constraint and non-availability of local experts and technical know-how may require foreign collaboration.

B. (i) In the industrial and economic development of Bangladesh there is a great demand for petroleum products. In Bangladesh at present approximately one million ton of crude oil is imported and refined at the Chittagong Refinery. Although the present need of Petroleum product is met through ERL and some import, there is likely to be a gradual increase in the demand for these products. As such the possibility of either expanding the existing capacity of ERL or establishment of a new refinery needs to be considered in the near future.

(ii) The costs of crude and petroleum product imports amount to Taka 36 crores during the current financial year. This may rise up to Taka 80 crores per year at the end of the First Plan period. Therefore, it is essential to explore the possibility of substituting indigenous resources such as natural gas for oil in such areas, as power generation, domestic kerosene consumption and as a prime mover in industry.

C. (i) As a raw material substitute in the petro-chemical sector, gas utilisation will seek to save foreign exchange by producing PACN fibre as a cotton substitute, PVC as a metal substitute and urea as a vital input for food production. Various by-products of the petro-chemical sector will have a high foreign exchange saving potential.

(ii) The strategy adopted for expansion of the gas system will be to balance the existing distribution network in such a manner as to : (a) maximise the capacity utilization of the transmission system with minimum input so that in the relatively short run benefits of natural gas can be brought to as many consumers as possible, (b) prepare a master plan for building a countrywide network in a phased manner.

D. (i) The geological outline of the country needs to be clearly known for identification of the most promising areas for mineral or oil exploration. As such, necessary conditions must be created to launch a plan for extensive as well as intensive geological operations in the country

so as to achieve short, medium and long term targets in the minimum possible time. Primary work must, therefore, be initiated by the existing GSB to :

(i) accelerate the pace of regional mapping;

(ii) undertake geophysical survey;

(iii) conduct research in stratigraphy, geomorphology, geochemistry, marine geology and petrology etc.;

(iv) appraise resources in connection with economic geology;

(v) build up in due course a number of teams capable of undertaking any future development projects;

(vi) set up data centre to collect, compile and process all geological information. This is vital for first five year geological activities.

(ii) The value of geologic field work depends on the laboratory analysis of the samples and data collected in the fields. Laboratory facilities should, therefore, be built up commensurate with the expanded needs of GSB and OGDC.

(iii) Exploration and development of ground-water as a necessary input to the agriculture sector, is closely linked with the study of the hydro-geological situation, aquifer characteristics, etc. Emphasis has, therefore, to be placed on a systematic survey in reference to geo-chemistry of groundwater in Bangladesh because the existing data seems to be inadequate for the purpose.

11·2·4 Investment Programme

A. *Reconstruction Programme (Gas)*

This sector did not suffer any significant damage during the war of liberation. The Titas Gas Transmission and Distribution line was damaged due to the blowing up of Bhairab bridge by the Pak Army. This led to a reduction in the off take of gas but this will be made good with the repair of the Bhairab bridge by the end of September, 1973. Some seismic equipment and appliances of OGDC were also destroyed. In the GSB some transports and field facilities were damaged. The sum total of damage is not very substantial. Taka 10 lakhs including Taka 3 lakhs in F.E. has been provided for in the reconstruction programme.

B. *Exploration and Development of Oil and Gas (OGDC)*

(i) Within the allocation made to them, the Oil and Gas Development Corporation will take up two schemes in the First Five-year Plan, one on-going and the other new. The on-going scheme, was started in 1964. Apart from conducting surveys in prospective areas of Bangladesh, four deep and four comparatively shallow drilling operations were carried out under this scheme, at Jaldi and Samutang. Only one well at Jaldi is at the final stage of production testing.

(ii) On the basis of the geological, seismic and gravity surveys new drillings would be taken up at various regions in Bangladesh. Prospective structures proposed for test drilling during the Plan period are: Muladi, Begumganj, Sitakunda, Patharia, Olah Taung. Muladi has been considered as the first location for deep drilling. Approximate set up depth of the well on this structure would be about 4,500 meters, and penetration of upper Bhuban is expected. In the process of drilling the set-up depth of the well should be co-related with the available data. Efforts would be made to reach the Barail Series of Oligocene period which will be of significant interest.

(iii) Other programme include surveys (seismic, gravity and geological) in selected regions and detailed and semi-detailed geological mapping at Madhupur, Khulna, Chandpur and Sylhet. During the second year of the Plan period seasonal field work should be carried out on Madhupur uplift zone. The purpose of the work is to confirm the presence of the uplifted zone and to find out probable complications on the supposed reef body.

(a) Geological surveys will be conducted at Dakhin Nhila, Sitapahar, Inani, Sylhet and mapping and collection of structural data for correct evaluation of their prospects for oil/gas will be made during the period October, 1973 to March/April, 1974.

(b) Geophysical survey (reflection) will be conducted in Khulna area. As a result of gravity surveys carried out earlier, presence of good structures was indicated. The proposed seismic survey is aimed at proving the positive anomaly and to locate suitable drilling points.

(c) Gravity survey will be conducted in Dacca and Faridpur. Earlier geomorphological studies indicate existences of oil/gas bearing structure under the alluvial plain. Faridpur region indicates the presence of a trough, which may yield oil/gas. The object of gravity survey is to determine the precise location and extent of the trough, to be confirmed later by seismic surveys. Similarly in the uplifted zone (underground) of Dacca extending to Barisal, suitable structures may be found for which a gravity survey is proposed during November 1973 to April 1974.

(iv) To assimilate and analyse the findings of various drillings and surveys proper laboratory facilities shall be created during the First Five-Year Plan.

C. *Bangladesh Mineral Oil and Gas Corporation (BMOGC)*

The BMOGC will undertake the following Programme:

(a) *Feasibility Studies:*

(i) To meet the energy requirement for Western Zone feasibility studies on various alternatives like setting up of an additional refinery or East-West interconnector or nuclear power plant, etc., would be made.

(ii) A feasibility study of Chittagong-Chandpur Oil pipeline would also be made.

(iii) Feasibility of creating increased storage capacity of Petroleum products in the Western Zone will be explored.

(b) *ERL:*

(i) Asphalt bitumen plant: An asphalt bitumen plant would be set up to manufacture bitumen of different grades from furnace oil available locally from our refinery capacity. The plant will have an annual capacity to produce 50,000 tons with scope for further expansion.

(ii) *LPG unit to utilise surplus petroleum gas (Butane and Propane)*—At present about 31,000 tons of petroleum gas remain unutilised after processing of crude and is left to burn in the air at ERL. This can be liquified and used as industrial and domestic fuel.

(iii) *Off-shore Oil Terminal (OSOT):* Economic operation of ERL is vitally linked with the proper functioning of OSOT. Economic operation of ERL is only possible if crude oil is discharged from lighterages berthed at an OSOT and pumped to the refinery through submarine pipeline.

(1) The existing OSOT will be repaired and commissioned by the middle of 1974 as an ad-interim measure.

(2) A feasibility study will be undertaken to investigate the most suitable location for constructing a Deep Water Terminal (DWT) to cope with the larger imports of oil and the increasing size of oil tankers.

(iv) *Balancing of the Refinery*: Crude is normally associated with sulphur and sulphur compound in various forms. EERL is designed to process crude with only per cent sulphur at the maximum. When the desulphurisation plant is installed, the refinery will have flexibility of selecting high sulphur cheap crude.

(c) Gas:

(i) In the BMOGC (Gas) two big and one small gas transmission projects outside the Titas franchise area would be taken up during the Plan period. Titas Gas Transmission and Distribution including Greater Dacca will be the responsibility of TGTD Co. Table XI-8 will show present and projected off-take of gas in MMCF/day for different consuming units.

TABLE XI-8

Present Status of Transmission and Distribution of Gas and Physical Targets at the end of Plan Period.

	Projects.	Present off-take ((1973). MMCF/-Day).	Projected off-take at the end of the Plan period (1978). (MMCF/Day)
1	Titas Gas Transmission and Distribution in Dacca and Greater Dacca including Siddhirganj Power Station (From Titas).	15	20
2	UFF/Ghorashal Power Station (From Titas) ..	35	65
3	CCF/Chhatak (From Chhatak) including Power ..	5	5
4	Power, Industrial, Commercial and other uses in Chittagong area and 1 million ton Fertilizer Factory (From Bakhrabad).	..	140
5	Ashuganj Power Station (From Titas)	15	20
6	Shahji Bazar Power Station (From Habiganj) ..	16	20
7	NGFF Fenchuganj (From Sylhet)	10	15
8	Pulp and Paper	..	3
	Total ..	96	288

(ii) Schemes under existing Titas Franchise:

The following projects which are extension to existing Titas system are included in the first Plan:

1. Dacca and Greater Dacca distribution network.
2. Joydevpur distribution main project.
3. Narayanganj distribution network.
4. Sitalakhya east bank project.
5. Savar distribution main project.
6. Bhairab Bazar distribution network.
7. Ghorasal distribution net work.
8. Brahmanbaria distribution network.
9. Titas-Ashuganj Parallel pipe-line project.

(iii) Schemes outside Titas Franchise:

1. *South-eastern gas trunk line*—This trunk line will originate from Bakhrabad Gas field to cater needs primarily of Chittagong-Chandraghona industrial complexes. However, the township along the trunk line such as Comilla, Feni etc., may also be supplied with gas.

2. *Bakhrabad-Chandpur Gas Trunk Line*—The scheme is proposed for supply of natural gas to the existing and projected industrial units in and around Chandpur. This will also originate from Bakhrabad.

3. *Sylhet Tea Valley gas pipe line*—This is a scheme of relatively small network in Sylhet district to supply gas to a block of Tea Estates.

D. *Geological Survey of Bangladesh (GSB).*

The existing GSB would be gradually developed into a full-fledged National Geological Survey of Bangladesh and the following projects would be undertaken:

(i) Roughly 15 per cent of the total area of Bangladesh will be surveyed and mapped in the scale of 1: 50,000 to cover an area of roughly 8,000 sq. miles. Priority of areas shall be fixed in due course.

(ii) Revision of Geological mapping in the scale of 3" to one mile.

(iii) Surface and sub-surface Geological investigation will be carried out in prospective areas. The exploration comprising of detailed geological and geophysical surveys supplemented by test drilling at selected locations in Bogra-Rajshahi districts will make it possible to work out a complete sub-surface geological setting of the region and assess its potential.

(iv) Geological exploration in Rangpur and Dinajpur districts. This project will delineate the distribution of the reserves in the area and determine scope of exploiting the same. The study will involve two types of investigation: (a) detailed geophysical survey of the area and (b) test drilling. The investigation may also indicate, the presence, if any, of limestone and coal at shallow depths.

(v) ther programme will include:

(a) Development of laboratories and field facilities. The proposed project will be set up within the GSB to cater to all geological programmes.

(b) Development of exploration facilities to cater to the geological activities including drilling and exploration of other similar corporation such as Bangladesh Mineral Exploration and Development Corporation (BMEDC) and BMOGC.

(c) Geophysical exploration should be conducted to delineate its regional geological configuration.

(d) *Geochemistry of Ground-water*—The chemical and biological characteristics of water will be analysed to determine its usefulness to agriculture and industry.

(e) *Deltaic research, marine geology and geomorpholigical study*—The rivers, and the nature of sedimentation etc., will be studied under this head and the results of these studies will be useful to the hydrologists, agriculturists, foundation engineers, petroleum geologists and other scientists.

Agencywise breakdown of allocation can be seen in Table XI-9.

TABLE XI-9

Summary of the Financial Outlay.

(1973-78)

(Taka in lakh)

Agency.		Total.	F. E. C.
Reconstruction:			
1 Bangladesh Mineral, Oil and Gas Corporation (BMOGC) ..		10·00	3·00
Sub-Total ..		10·00	3·00
On-going:			
2 Bangladesh Mineral, Oil and Gas Corporation (BMOGC)	Gas ..	60·00	16·40
	Oil	..	..
3 Oil and Gas Development Corporation (OGDC)		30·00	20·00
4 Geological Survey of Bangladesh (GSB)		177·20	85·40
Sub-Total ..		267·20	121·80
New:			
5 Bangladesh Mineral, Oil and Gas Corporation (BMOGC)	Gas ..	4270·00	2117·40
	Oil ..	1445·00	940·00
6 Oil and Gas Development Corporation (OGDC)		1583·70	820·80
7 Geological Survey of Bangladesh (GSB)		600·00	272·50
Sub-Total ..		7898·70	4150·50
GRAND TOTAL ..		8175·90	4275·30

11·2·5. Institutional Policies and Facilities

There must be appropriate institution and policies to ensure efficient exploration, production, distribution and marketing of mineral resources. With this end in view the following recommendations have been made in the Plan:

A. *Organization*

(i) Bangladesh should have a single, strong National Geological Survey adequately staffed and equipped to undertake geological studies that are basic to the development of the natural resources of the country. The size of the organization should be commensurate with the needs of resources development. The present GSB may be improved and expanded to play this role.

(ii) Once the mineral resource potential has been identified by GSB, exploration and exploitation will be required. Starting from feasibility study, exploration and exploitation to marketing of minerals will be the responsibility of Bangladesh Mineral Exploration Development Corporation (BMEDC). The present set up of BMEDC will be expanded and re-organized to form a full-fledged Corporation which will cater to the needs of mineral based industries of the country.

(iii) Exploration, development and marketing of Oil and Gas should be treated as an integrated function. The task should be the responsibility of a single Corporation. This Corporation should include and be responsible for all matters relatings to:

(a) *Exploration*: For this OGDC should be set up as an independent enterprise of the Corporation.

(b) *Production:* (i) Eastern Refinery, (ii) Shell Bangladesh Limited and (iii) Bangladesh Petroleum Limited should be put under this Corporation.

(c) *Marketing*: The following oil companies should be brought under the Corporation: (i) Jamuna oil company, (ii) Burmah Eastern Company (51 per cent share of Government in Burmah Eastern should be looked after by this Corporation), (iii) Padma Petroleum Company, (iv) ESSO Standard Eastern Inc., (v) Titas Gas Marketing functions under TGTD Co. should also be brought under this Corporation.

(d) The Corporation should be placed under the Ministry of NR and STR and AE and the Chairman of the Corporation should be directly responsible to the Minister.

B. *Concession Policies*

(i) Formulation and enforcement of the rules and regulation for Petroleum and Minerals concession, pricing and conservation shall be within this category. These activities will be vested on the Natural Resources Division (NRD) of the Ministry of NR and STR and AE.

(ii) It is recognised that any Petroleum, Gas or Mineral which may exist in its natura state underground is the property of the state. Bangladesh will, therefore, have to decide upon the manner in which the search for and development of these resources within its territory shall be conducted. To the extent that concessions will be awarded to foreign Prospectors. Terms will have to be formulated which protect the nation's interests both now and in the future without frightening away Prospectors.

C. *Training*

There is an acute shortage of locally available expertise to undertake difficult and complex assignments inherent in natural resources investigation and technology. Such personnel will be needed in survey, research, exploration, laboratories, and in production. A programme for training in this technology is urgently needed. Efforts should also be made to stop the current brain drain.

D. *Gas Tariffs*

The tariffs for different uses of gas are currently being charged in more or less arbitrary manner. A national gas tariff will have to be formulated, taking into consideration the various aspects and economics of gas transmission and distribution during the Plan Period.

11·3 SCIENTIFIC AND TECHNOLOGICAL RESEARCH

11·3· Introduction

Promotion of scientific knowlegde and development of technology, through their increasing application pave the way for socio-cecconc mic develc pment in every country. Technical know-how, locally developed or imported and then adapted through research, makes possible the economic exploitation of our natural resources.

In our country, the textile industries, the pulp and paper industries, hard board and fibre board, paints and varnishes, rubber and plastics, fine chemicals, pharmaceuticals, glass and ceramics, sanitary wares and stone wares and various types of food processing and food preserving industries can be developed by utilising indigenous raw materials provided suitable technical know-how can be developed and made available. In the field of agriculture, the application of radiation methods has already developed high yielding varieties of seeds for rice and jute and it is hoped that the same methods will soon replace the conventional use of insecticide for plant protection. The contribution of scientific knowledge and research in the development of water and power, health and medicine, physical planning and housing, and transport and communication is also significant.

Prior to liberation scientific and technological research in Bangladesh was a neglected field. Only about 0·13 per cent of the GNP of erstwhile Pakistan used to be spent on scientific and technological research but Bangladesh never received more than one-tenth of the total allocation.

The important agencies that had been at work at that time for promotion and dissemination of scientific knowledge, and development of technical know-how were, Council of Scientific and Industrial Research (CSIR), Atomic Energy Commission (AEC), National Scientific Documentation Centre (NSDOC), Museum of Science and Technology (MST), Jute Research Institute (JRI), Hydraulic Research Institute (HRI), and so on. After liberation most of these organisations which were only regional offices had to be elevated to national institutions.

11·3·2 Past Achievement

BCSIR Laboratories

The BCSIR Laboratory in Dacca started functioning from 1955 as a regional laboratory. Subsequently two more laboratories were set up, one at Chittagong and the other at Rajshahi. The laboratories in Chittagong and Rajshahi are still incomplete. The three BCSIR Laboratories have now assumed responsibilities required of national organisations and are known as Bangladesh Council of Scientific and Industrial Research (BCSIR) Laboratories. A large number of processes has already been developed in these laboratories in the fields of glass, ceramics, food processing, leather, drugs and other natural products. Some processes have already gone into production and other processes are ready to be leased out.

BAEC

Prior to liberation an Atomic Energy Centre was set up in Dacca as a multipurpose nuclear laboratory and a Nuclear Medical Centre . Two more Medical Centres at Chittagong and Rajshahi and an Institute of Nuclear Agriculture at Mymensingh were under construction. Mineral surveys along the Cox's Bazar beach and offshore islands were underway in Bangladesh before liberation. A number of feasibility studies had also been made to introduce nuclear power in Bangladesh. A site was selected at Rooppur and about one crore rupees had been spent. An

Irradiation and Pest Control Research Institute (IPCORI) for Bangladesh had received approval but no action was taken to implement the decision. The results achieved within the limited facilities available, especially in the fields of physics and agriculture, had brought world-wide recognition. A number of research contracts were awarded and fellowships and equipment provided by the International Atomic Energy Authority (IAEA) as aid.

BANSDOC

Bangladesh National Scientific and Technical Documentation Centre (BANSDOC) is engaged in collection and dissemination of scientific knowledge and information and promotion of research facilities in the country. Since its inception, BANSDOC has collected a large quantity of scientific information and distributed them amongst research workers.

11·3·3 Objectives and Stategies during the First Five-Year Plan

A. *National Science Policy*

The re-organisation of the existing research laboratories and institutes and the establishment of an effective central agency for the co-ordination, control and overall planning of scientific effort in the country are an immediate necessity. To achieve maximum results towards this end, it is necessary to formulate and implement a National Science Policy at an early date. At the initiative of the Ministry of Natural Resources and Scientific and Technological Research, such a policy may be formulated on the following lines:

(i) To re-organise existing Governmental Research Laboratories and Scientific Institutions and to bring them under a unified system.

(ii) Careful selection of the problems facing the country in each vital sector, where solutions are likely to have a significant impact on the economic and socio-cultural development of the country. To determine priorities when such problems are identified.

(iii) Raising the standards and improving the facilities available to existing research institutions, including research in the universities.

(iv) Eastablishment of new scientific and research institutions/laboratories, where research of high quality can be carried out on selected problems of national importance.

(v) Improvement of standards of scientific education at all levels from the school to the university. Training of personnel and specialized scientific staff in the research institutions/laboratories and industrial establishments.

(vi) Utilization and application of results of research for commercial and extension purposes.

(vii) To create centralized facilities for collection and dissemination of scientific information and research findings.

(viii) To provide centralised facilities for manufacture and repair of scientific apparatus and instruments of all kinds.

B. *Research Institutions*

The new Research Laboratories/Institutes, that will be coming up in the plan period may be located as clusters (not in isolation from one-another) in different parts of the country. In the process of re-organisation of the existing research institutions and setting up of new ones, complete co-operation among the various research institutions will have to be established in order to avoid any duplication or overlap in research work and facilities. Owing to the inherent limitations on both material and human resources, scientific and technological research should be confined only to those fields which are of vital importance to our economy and on which parallel research results are not available. In other fields we should draw upon the vast pool of scientific knowledge which has accumulated in the world as a result of scientific effort in the developed countries. This will necessitate the expansion of scientific institutions and information centres such as the BANSDOC and the Museum of Science and Technology. A centralized scientific instrument manufacturing and repairing centre is also urgently required.

In formulating a research programme, basic research should be carefully distinguished from applied research. At this stage maximum stress should be laid on applied research which could lead to development and production of useful materials and devices, methods and processes in agriculture, industry, medicine and other fields. Scientific education at all levels should be remoulded so as to put emphasis on applied research at all levels.

Priority should be given to strengthen scientific research facilities in the universities. Whilst the Governmental Laboratories/Institutes will concentrate only on practical problems of an applied nature, the universities should be given greater freedom of choice in selecting research programmes, which may often be of a fundamental or theoretical nature.

An effective system requires to be developed for mutual co-operation, exchange of personnel and flow of ideas between the universities and scientific and research organizations. For this, there should be a close contact between the research workers of the Government Laboratories, centres/institutes and those of the Universities, higher technological institutions, industrial establishments and so on, so that the facilities existing in these institutions can best be utilised by a large number of research workers to promote research, design and development within or in collaboration with one another. The scientists of these organisations should also participate in annual national conferences on different subjects such as science, engineering, medicines, etc.

Several processes have already been developed by the Research laboratories and leased out for commercial use in certain industries such as ceramics, glass, leather, etc. The quality of these products needs further improvement and hence research activities in these fields should be intensified with a view to improving upon the quality and making the products internationally competitive.

The Bangladesh Atomic Energy Commission which has concentrated its efforts mainly on development of nuclear power and technology, physical sciences, Bio-sciences and space research will continue to promote its efforts for peaceful uses of nuclear energy. In the

First Plan, it will devote itself mainly to production of high yielding varieties of crops through the radiation method and application of radio-isotope for treatment. It will also strengthen its research on electronics to boost the electronics industry of the country.

C. *National Council of Science and Technology (NCST)*

Co-ordination of Scientific research in the research institution and the Universities is extremely important. For this purpose a high powered National Council of Science and Technology (NCST) may be set up. The main objectives and function of the council will be:

(i) To advise the Government on matters both national and international, concerning Science and Technology, to determine the requirement of research in various fields and set priorities of research. It will also decide what research to initiate and what new research institutions to set up in future.

(ii) To re-organise the existing research laboratories/institutes.

(iii) To co-ordinate and evaluate work being carried out in different research institutions. It would also sponsor research programmes which may be carried out or undertaken either in one of its own laboratories or in the universities.

The Ministry in-charge of Scientific and Technological Research may maintain overall co-ordination between the activities of the research institutions concerned with researches on economic exploitation of the natural resources and those agencies which are mainly concerned with survey, investigation and exploration of these resources. This will minimise any abnormal time lag in the economic exploitation of these resources. Necessary co-ordination should also be maintained with the Ministry of Industries so that the actual application of processes developed takes place immediately in industries on a commercial scale.

D. *Training and Manpower*

There is an acute shortage of technically trained manpower at all levels, particularly at the level of leaders in science and research. Adequate facilities should be provided for higher training of research personnel and scientific staff of research institutions and universities. It should also be ensured that scientific research becomes sufficiently attractive to men of ability and talent. Decent salaries and due status in the society will attract many talented persons and men of ability towards a research career. Many young and talented scientists have a tendency to leave the country in search of better opportunities abroad. Effort should be made to stop such a brain drain, which our newly liberated and developing country can ill afford. In addition to the scientists who are working within the country and those who may return from abroad, it is estimated that about 800 scientists and technologists at the level of group leaders (Ph.D. or equivalent levels) will have to be trained during the First Five-Year Plan Period.

The different research laboratories and institutes should maintain international liaison with scientific bodies and academies and with specialised agencies of the U. N. O. concerned with scientific education and research.

11·3·4 Financing and Programmes

(a) Scientific and technological research is a vast field where various Ministries, Government agencies and the universities participate. In this chapter, the research programmes of only those agencies administratively controlled by the STR Division of the Ministry of NR and STR will be discussed.

(b) The agencies who will be receiving allocations from the STR Sector are the following :

(i) Bangladesh Council of Scientific and Industrial Research Laboratories (BCSIR) at Dacca, Rajshahi and Chittagong.
(ii) Bangladesh Atomic Energy Commission (BAEC).
(iii) Bangladesh National Scientific and Technical Documentation Centre (BANSDOC).

The allocation for these agencies in the First Five-Year Plan is Taka 16,94·20 lakhs, Taka 10,59·20 lakhs for 17 on-going schemes and Taka 6,35·00 lakhs for 20 new schemes.

A. *BCSIR Laboratories*

(i) The First Plan allocation for schemes of the BCSIR Laboratories, Dacca is Taka 4,06·80 lakhs. This will cover seven on-going schemes and five new schemes in the fields of food, leather, glass, ceramics, fuel and other natural products such as jute textiles, silk, pulp and paper, etc.

(ii) In formulating the programme, attention has been given to the need for utilization of the indigenous raw materials of the country, improvement in the quality of certain kinds of products such as ceramics, and leather goods and diversification of the use of certain resources such as jute.

(iii) The BCSIR laboratory at Rajshahi will implement one development scheme for research and process development in the fields of fibre, lac, fats, oils and waxes. The First Plan allocation for this is Taka 1,28·80 lakhs.

(iv) The allocation for the Chittagong BCSIR laboratory during the First Plan is Taka 3,00·40 lakhs. This laboratory will concentrate mainly on research and development in the fields of Drugs, Pharmaceuticals and Tropical Products.

B. *BANSDOC*

BANSDOC will take up one on-going scheme. The total allocation for this scheme is Taka 30·00 lakhs. On implementation, the project will serve as a national centre for collection, documentation and dissemination of scientific information for the whole country.

C. *BAEC*

(i) During the first Five-Year Plan period, BAEC will concentrate on nuclear power development and associated scientific and technological problems; develop electronics and applied space science; exrtract beach sand minerals in commercial quantities; develop nuclear bio-sciences to solve problems of food and health.

(ii) For this, the Atomic Energy Commission will continue the implementation of 7 on-going schemes and introduce 15 new projects during the plan period. The schemes include :

A Nuclear Power Plant of appropriate size.

An Institute of Nuclear Technology at Roopppur.

An Institute of Beach Sand Minerals at Chittagong.

Commercial Extraction Plants in the Cox's Bazar area.

(iii) The bio-science programme will concentrate on evolving new varieties of rice, jute, sugarcane and pulses and recommend improved agricultural practices by studying soil-plant relationship. Also, commercial methods of radiation, preservation of food will be evolved.

(iv) Increased application of radiation and radio-isotopes will be used not only for diagnosis but also for treatment of many diseases, including goitre, cancer and blood disorders.

(v) Stress will be given on technological developments in electronics, metallurgy, analytical chemistry and precision workshop techniques whose impact will be felt throughout the country.

(vi) Increased application of radio-isotopes tracer techniques would provide quality control on industrial products and solve various hydrological problems, including the silt movement under rivers and at harbours. This is essential for our flood control and water communication programme.

(vii) The plan allocation for the A.E.C. programme, is Taka 8,28·20 lakhs, including token allocation of Taka 10·00 lakhs for the Roopppur Nuclear Power project.

Agency-wise allocations are as follows:

First Plan Allocation

(Taka in lakh.)

	Total	F.E.
1. BCSIR, Dacca	4,06·80	1,39·50
2. BCSIR, Rajshahi	1,28·80	22·00
3. BCSIR, Chittageng	3,00·40	54·50
4. BANSDOC	30·00	5·00
5. BAEC	8,28·20	2,71·90
Total ..	16,94·20	4,92·90

Besides the above, research on science and technology will also be conducted in specific fields by other agencies under other sectors. These programmes have been detailed elsewhere under other sectoral programmes of the First Five-Year Plan.

The allocation for scientific research under those sectors are as follows:

(Taka in lakh.)

Name of Sectors.	Allocation.
1. Agriculture	33,00·00
2. Industry	2,17·10
3. Flood Control and Water Resources	3,60·00
4. Transport and Communication	2,90·30
5. Physical Planning and Housing	11,15·00
6. Health	7,66·60
7. Education	2,00·00
8. Power	10·00
Total ..	62,59·00

Including the allocation that will directly flow from the Scientific and Technological Research Sector, the total allocation for scientific research in the First Five-Year Plan is:

(Taka in lakh.)

Sector.	Allocation.
1. STR	16,94·20
2. Other than STR	62,59·00
Total ..	79,53·20

Moreover, a sizeable amount will be invested in project-oriented engineering and geological surveys and investigations and feasibility studies. If allocations for such programme are included, the outlay for scientific research would increase considerably.

In addition to the Public Sector research programme on scientific and technological research as spelled out above, some research will also be carried out in individual industries in the private sector. Therefore, the Private Sector's contribution towards research in general and research on specific problems will add to the investment in this sector during the First Five Year Plan.

SUMMARY OF THE FIRST FIVE YEAR PLAN

Scientific and Technological Research

(Taka in lakh.)

	Name of the Agencies.	FIRST PLAN ALLOCATION					
		On-going.		New		Total.	
		Total.	F.E.C.	Total.	F.E.C.	Total.	F.E.C.
	1	2	3	4	5	6	7
1	BCSIR, Dacca ...	3,32·80	1,20·40	74·00	19·10	4,06·80	1,39·50
2	BCSIR, Rajshahi ...	1,28·80	22·00	...	...	1,28·80	22·00
3	BCSIR, Chittagong ...	3,00·40	54·50	...	...	3,00·40	54·50
4	Bangladesh Atomic Energy Commission.	2,67·20	91·90	5,61·00	1,80·00	8,28·20	2,71·90
5	BANSDOC ...	30·00	5·00	...	...	30·00	5·00
	Total ...	10,59·20	2,93·80	6,35·00	1,99·10	16,94·20	4,92·90

CHAPTER XII

PHYSICAL PLANNING AND HOUSING

12.1 INTRODUCTION

Physical Planning deals with the geographic expression of a country's economic and social policy and relates directly to planning of land, physical structures and various construction activities on a national, regional and local level. It thus assists in better use of land and resources. In the past the growth of physical welfare facilities, services and amenities has not kept pace with economic development in the country. This lack of emphasis on physical development has resulted in deteriorating living conditions in the face of a rising population as well as uncontrolled and unbalanced urban growth. Moreover, neither the benefits of economic growth nor the inappreciable *per capita* increase of welfare facilities have been able to reach the poorer income group who constitute the majority of the people.

The housing situation in the country is gradually worsening every year. Houses built by both the public and private sector do not even meet a fraction of the total need. In order to tackle this enormous problem, more emphasis needs to be given to housing for low income groups constructed either through housing co-operatives or direct state investments. These need to be supplemented by improved civic amenities which are today inadequate and deteriorating in the face of a growing population.

Supply of pure drinking water is scarce. Only a very small percentage of the urban population has access to pure drinking water whilst the sewerage system is limited to only a few selected areas within the cities. In the rural areas the supply of potable water and a sewage disposal system are virtually non-existent leading to the spread of water borne diseases such as typhoid, dysentery and other gastroenteric disorders.

The Physical Planning and Housing component of the Plan seeks to cover the following sub-sectors: (1) Institutional Development, (2) Housing, (3) Community Services and Utilities, (4) Government Offices and Institutional Buildings, (5) Metropolitan Development Agencies, (6) Tourism. It may be noted that there are as many as thirteen executing agencies and four Ministries related to the above sub-sectors who will administer the allocations made under this sector.

12.2 PAST PERFORMANCE, PROBLEMS AND REQUIREMENTS

A. *Institutional Development*

1. Physical Planning

Physical Planning as an activity started in a rudimentary form in Bangladesh in the early fifties with the preparation of a land-use plan for the city of Dacca and with the enactment of the Building Construction Act, 1952. It gained some momentum with establishment of the Dacca Improvement Trust (as a result of enactment of the Town Improvement Act) and Housing and Settlement Wing of the Buildings Directorate and other development authorities such as CDA, KDA in the late fifties. In 1964, with the rapid growth of urban agglomerations and unplanned location of industries, the necessity of creating a Physical Planning Organisation was felt to cope with the planning problems of the expanding urban areas and

growing industrial complexes. As a result in July, 1965, the Urban Development Directorate was created with the following objectives:

- To formulate an urban development strategy for the country with proper Physical and Socio-economic studies through the assistance of the United Nations.
- To identify new growth poles and delimit the Planning Regions.
- To prepare plans for the urban areas and growing industrial complexes.
- To advise the local authorities on the matters of planning and selection of sites.
- To frame Town and Country Planning Legislation.

While a number of land-use plans for various municipalities, new district and subdivisional headquarters and Industrial Complexes have been prepared by the Directorate, no substantial achievement in the objectives as envisaged in the U.N. assisted Project could take place due to the shortage of qualified Physical Planners in the country on the one hand and due to various difficulties in execution of the project and its eventual suspension at the time of War of Liberation by U.N.D.P. on the other.

Consequently we do not have today either a Physical Planning and Development Strategy or Comprehensive Town and Country Planning Legislation. Thus, co-ordinated and balanced development could not be achieved nor could haphazard and unplanned growth of urban centres and Industrial complexes be arrested even when some land-use plans were made available by the Directorate.

In a country like ours where the land-man ratio is extremely low and worsening, the capacity of our land to maintain and absorb the fast increasing population in our countryside is also declining progressively. This decline in the retentive capacity of our rural areas is bound to push more and more people out of the rural section leading to acute urban problems of deteriorating living conditions, squatter settlements and overloading of urban services. Simultaneously the progressively decreasing *per capita* availability of agricultural land will generate new problems of a considerable magnitude in the rural areas in terms of housing, housing facilities and services and utilities and other problems related to the rural component of human settlements. Thus the necessity for rational and optimum use of every inch of our land inescapably points to the need for complete Physical Planning coverage of the country and to the need for preparation of a rational physical planning and development strategy. Physical environment conducive to better economic and social output which helps to achieve better living conditions particularly for the masses of our population should be the objective.

Physical planning organisations which exist now in the form of "Urban Development Directorate" under the Ministry of Public Works and Urban Development and the 'Physical Planning and Housing Sector' in Planning Commission are not capable of handling the total physical planning problems and of attaining the objectives of Physical Planning. In the absence of appropriate organisations all developments relating to land are taking place in an unco-ordinated and haphazard manner resulting in unplanned growth of towns and cities, undesirable overcrowding in some urban areas, unbalanced regional development and inappropriate location of economic activity.

One of the fundamental and urgent problems of national development is the task of modernisation of our rural economy. Indeed the primary objective of our First Five-Year Plan is to develop the tradition bound and inefficient rural productive system through institution building.

supply of basic inputs and overhauling of the rural administration. However, increased economic output in the rural areas will not automatically ensure increased welfare and equitable distribution unless the extensive rural development programmes are implemented within the framework of regional physical development plans.

Therefore, regional and local planning needs to be initiated for the purpose of integrating, co-ordinating and balancing the policies and programmes relating to physical realisation of development activities within the national geographic space.

Appropriate legislation setting up procedures and institutions need also to be enacted and established for effective implementation of physical planning and programmes.

Special problems exist in the country arising out of uneven regional development due to concentration of development activities in and around the three metropolitan cities, Dacca, Chittagong and Khulna. Within the framework of the national objective of attaching equal emphasis to the development of all areas of the country, it has become necessary to programme for planning and development of a number of growth poles in the hitherto lagging regions.

Therefore, there is an urgent and immediate necessity of setting up appropriate organisations by restructuring and strengthening the present ones as well as creating new ones if need be for the purpose of realising the objectives of an eventual planned environment for Bangladesh.

2. **Building and Housing Research**

Building and Housing research in Bangladesh was initiated in the early sixties with the establishment of a Building Research Institute under the Housing Wing of the Buildings Directorate. In the background of colossal damages to our existing housing stock due to natural calamities and growing scarcity of indigenous building materials the primary task assigned to this Institute was to evolve cheaper and more durable building materials, construction techniques and standards for low cost housing programmes. Unfortunately, for various reasons this Institute could not make much headway in its research activities.

There is an absolute lack of research and study in respect of building materials and construction techniques in the country. Considering the huge needs in relation to the lack of available resources both in terms of materials and finance, there is an urgent need for stepping up such research work on an emergency basis. The Building Research Institute has not yet made any impact so far on our building construction materials and techniques due to various difficulties. One of them is the low priority accorded to such research in the past and the other is the organisational inadequacies in terms of status and manpower of the Institute. Genuine efforts could be made for obtaining a team of international experts to organise and carry out urgent research work. Simultaneously action could be directed towards training of our own technical people for eventual manning of the Institution. No significant steps were taken in this direction. Consequently the Institute is suffering from an acute shortage of trained personnel. Further, lack of adequate incentive to attract necessary talents in the field of such research discouraged many who would have otherwise joined the Institution. Consequently, the problems of recruitment and retention of professional staff are still plaguing the Institution. In order to alleviate these problems a special committee constituted earlier recommended reasonable salaries and other fringe benefits for the professionals but these were not given effect.

For proper guidance, supervision and management of the affairs of this research institute and also to ensure effective output there is need for setting up a National Housing and Building

Research Council consisting of eminent technical and administrative personnel from the Government, Universities and professional organisations. There is also a need for revamping the Institute itself by raising its status to that of an autonomous body and streamlining its internal functional and administrative system.

3. Special Studies, Surveys and Pilot Projects

In the process of First Five-Year Plan formulation the Physical Planning and Housing Sector is facing critical deficiencies in specific statistical data to provide the basis for policy formulation for the various sub-sectoral activities. As such the Planning Commission feels it necessary to provide for basic research and special studies under its own aegis during the Plan period. Some of the areas requiring studies and surveys have already been identified as under:

Urban Housing Survey.

Rural Housing Survey.

Also it is essential that the suspended UNDP Project on Location and Planning of Cities which aimed at the preparation of a national physical planning and development strategies for the country be revived on a priority basis.

B. *Housing*

1. Historical Development

The housing situation in Bangladesh has never been satisfactory. The majority of dwelling units are temporary, sub-standard, unsafe and overcrowded. The ancillary physical, social and economical facilities and services essential for the development of healthy and harmonious community life are highly inadequate both in the urban and rural areas.

Past patterns of community housing development in the urban areas were largely concentrated on providing housing plots and community facilities to upper income groups and houses for the public servants. The exception was a special programme of low cost housing for displaced persons. In the private sector, the profit being the chief motivation factor it was always more profitable to build houses for upper income groups. As a result we have a large backlog of low income and middle income group housing. The current need is therefore, to restore the balance in urban housing development towards the needs of the low income groups before we can even begin to cope with substantial improvement in the living conditions of the urban poor. This implies a major emphasis on public housing and facilities for this class.

Traditionally rural housing has been taken care of by the villagers themselves and the public sector did not play any significant role apart from providing some services and facilities. Since the enormity of the rural housing problems cannot be tackled in any appreciable degree through the public sector during this Plan period due to resource constraints, we can only make a beginning in improvement of living conditions in the villages. This will mean the provision of community services such as pure drinking water, improved sanitation, and improved communication systems. Secondly, improvement in the quality of building materials capable of withstanding the elements is needed as is the need to plan village communities on a more rational basis, as a departure from the traditional pattern of isolated homesteads and scattered primary clusters.

Rural Housing

The bulk of the rural population comprises the poorest income group of our population for whom the available dwelling units are only in the form of shelters which do not adequately meet their minimum needs. Village houses are mostly self built and the traditional houses provide mere shelter and are vulnerable to destruction and damage due to climatic hazards and flooding. Apart from ensuring that dwelling units keep pace with the population increase, there is thus a manifest need to improve the quality of village housing in terms of improved structures to reduce the recurring annual loss to the housing stock caused by climatic hazards and natural dilapidation.

Though data are not available to assess the annual shortfall brought about through destruction and damage by climatic and natural hazards, and by natural dilapidation, it can safely be said that the accumulated housing shortage is very large indeed. Further, the shortage is progressively increasing because replacement is not fully made up nor is the rate of construction keeping pace with population growth.

More recently the situation has been aggravated by the colossal destruction caused to the houses and local building materials by the occupation army during the War of Liberation. Though an appreciable number of dwelling units and shelters have been rebuilt through various international voluntary agencies, self-help and government efforts, there still exists a substantial shortfall in rural housing both to recompense the destruction and to cope with the increase in population.

Apart from the shortage of dwelling units and unsatisfactory service provisions in the rural areas, there are certain shortcoming endemic to our rural settlement pattern. There are about 64 thousand rural settlements scattered all over the country-side mostly in the form of primary clusters, small hamlets and isolated homesteads. This gives rise to a variety of problems in providing community services and utilities on an economic basis.

A further problem derives from the scarcity and high cost of building materials and the absence of building industry.

Another important facet of rural housing which merits special attention is the diversion of agricultural land for housing construction. During this plan period alone we will require about 3 lakh acres or 470 square miles of additional land for rural houses at the present village density rate of 30 person per acre. By the turn of this century, 10 lakh acres or 1,500 square miles of additional land will have to be diverted for housing at the same density rate, assuming that 10 crore persons (i.e., two-third of the total population) will live in the rural areas.

One of the basic reasons for lack of any programme in the field of rural housing stemmed from the absence of an organisation which could plan, programme and implement viable projects. These institutional and organisational deficiencies have also presented themselves as major constraints now that the Government is programming for substantial improvement of our rural living conditions.

In the rural areas according to the 1961 census over 77 per cent of the houses are temporary and approximately 2 per cent are permanent and semi-permanent and the remaining 21 per cent are unclassified. These figures will show substantial deterioration as a result of the problem identified earlier.

The population figure of the country is expected to be 8·54 crore by 1977-78. If the rate of construction of dwelling units fails to keep pace with the growth of population, the emerging problem will be acute. An approximate analysis of the requirement of dwelling units likely to be generated during the Plan period may explain this further. The population during this period is likely to increase by 1·2 crore in the country and at the rate of 6 persons per dwelling units an addition of 20 lakh new houses will be required to cope with this increase of population only. Of these, well over 15 lakh will be required for the rural areas. If we further assume that there had been requirement of 30 lakh dwelling units to be replaced due to damage, destruction and natural dilapidation up to the end of 1971, then the total requirement up to 1977-78 for the rural areas would be above 45 lakh.

However, the efforts of the government to provide shelter to the affected families (mobilised through the Ministry of Relief and Rehabilitation and other International Voluntary Organisations) have been able to offset a part of such shelter needs. The number of dwelling units reconstructed by these Voluntary Organisations is approximately 3 lakh (up to the end of 1972), while their target to extend such assistance is 4 lakh by 1973. The input in the form of cash doles and building materials extended by the Ministry of Relief and Rehabilitation towards the erection of shelters on an aided self-help basis for the affected families amounts to Taka 5 crore. There is also a programme for building a substantial number of dwelling units and construction of primary school-*cum*-cyclone shelters in the cyclone affected coastal belt with the provision of potable water and other utility services. Housing policy must therefore aim to:

- provide further input to the already constructed shelters built through aided self-help for their qualitative improvement, to raise the standards of these shelters to that of Basic Minimum Dwelling Units with better materials, to enlarge accommodation and elementary sanitation and to make other facilities available for each unit;
- give assistance for construction of dwelling units with ancillary facilities to meet the generated demand during this Plan period;
- improve the service utilities and to provide housing facilities and amenities which are practically non-existent in the rural areas;
- make an effort through pilot projects to promote the conception of planned villages for economising land use for housing purposes and also to facilitate provision of community services and utilities;
- frame adequate housing codes, building bye-laws and planning legislation.

3. Urban Housing:

The housing situation in the urban areas is equally acute. The situation is fast deteriorating due to the rapid influx of the rural migrants to the metropolitan areas and large cities. The growing pressure on the urban centres has manifested itself largely in the proliferation of slums and squatter settlements and a special breed of conditions which characterise most of our urban slums. The current mushrooming of these squatters in the capital city of Dacca on any available vacant land undermines any effort at rational planning of the urban community and hence posing a serious menace to urban sanitation and health. This deteriorating situation if allowed to continue unchecked will not only breed social discontent but may also threaten the stability of our urban communities.

In the urban areas approximately 27 per cent of the houses are permanent and semi-permanent in character the rest being temporary and unclassified. But quite a large fraction of the urban population live in the bustees and squatters settlements in the large towns and cities. The rate of influx of rural people to the major urban centres is progressively increasing. Consequently, on the one hand the number of squatters settlements have increased and on the other hand the occupancy rate per room has increased considerably, causing further deterioration of blighted areas and bustees. From the simple fact that the population has almost doubled during the last decade in Dacca City, and also because there has not been any corresponding increase in the housing stock, it can be safely deduced that the occupancy rate of the overcrowded houses has further gone up resulting in serious, unsafe and unhealthy overcrowding. The accelerated rate of rural immigration has also caused a tremendous pressure on the utility services and urban transport system.

Till the late 50's urban housing in the Public Sector consisted only of public servants housing and some plot developments in the metropolitan cities under the then Communication and Buildings Department (C&B). In 1958 a special Housing and Settlements Wing was created under the same department initially to cater for planned resettlement of the refugees. This organisation developed seventeen housing estates and constructed 26,000 nucleus houses and about 10,000 housing plots mostly for displaced persons. The Buildings Directorate Public Works Department, the autonomous bodies and the Urban Development Agencies meanwhile constructed a number of houses and flats and developed some housing plots. Except for the housing plots developed by the urban development agencies for the upper income groups, virtually no general housing programme has either been drawn up or executed so far.

The Housing and Settlement Wing of the Buildings Directorate was later elevated to a full-fledged Directorate in 1970. But with its present organisational structure and strength it is not capable of handling the total urban housing problems.

The urban development agencies are currently facing greater difficulties in terms of organisation and manpower. This situation is partly responsible for the general housing crisis in the metropolitan cities of the country. Past financing policies were also greatly responsible for the deficiencies.

The urgency of the problem in the urban areas arises not so much from the replacement needs due to damage and annual dilapidation but from the need arising out of heavy migration from the rural areas and natural increases. In addition to fundamental problems such as shortage of buildable land, limitation of resources, absence of building industry and high cost of building materials there are some special problems peculiar to the urban areas. These may be identified as shortage of houses particularly for the lower middle and lower income groups, overcrowding and acute congestion in the bustee areas, growth of squatter settlements and inadequacy of ancilliary housing facilities. Moreover, problems caused by the absence of proper organisation, Town and Country Planning Legislation. Housing Codes and bye-laws and the lack of adequate numbers of trained personnel are more pronounced in the case of urban housing.

The 1951 population census reveals that the urban fraction of the population in Bangladesh increased by 18 per cent over that of 1941. Between 1951 and 1961 urban population grew by 60 per cent from 18·2 lakh to 29·2 lakh. There has probably been an even higher rate of increase between 1961 and 1971. If we conservatively apply the same rate of growth prevalent between 1961 and 1971, urban population at the launching of the First Plan period will be 51·1 lakh. But from the past census figures, it is seen that the rate of urbanisation is accelerating with time. Therefore, the urban fraction of population in the country is likely to be higher than this conservative estimate.

Alternatively if it is taken that the present rate of urbanisation is between 6-7 per cent as estimated for the Developing Nations by the "Housing, Building and Planning Centre of United Nations", the urban population in the country has increased by 23 lakh over the last 12 years. Assuming this rate of increase total urban population in the country today is between 52 lakh to 55 lakh and may reach 80 lakh by 1977-78. So the total addition to the urban fraction of population between the period 1961 to 1977-78 is likely to register an approximate figure of 50 lakh. This indicates that during the last 12 years there had been a need for construction of at least 3·7 lakh dwelling units (at the rate of 6 persons per unit) without considering the backlog existing in 1961. It is very unlikely that the construction which has taken place during the last decade has met even a substantial fraction of the total requirement. If we optimistically assume that one-third of this generated demand has been met within the past decade through new construction by the private sector and public sector efforts, the rest of the urban dwellers have either squeezed themselves into the already overcrowded blighted areas and slums in the cities and/or are squatting in the urban areas. Assuming the total squatter population as 2 lakh the already high average occupancy rate of 3·1 persons per habitable room as of 1961 has further increased to 4·2. However, this average occupancy estimate does not reflect the actual over-crowding situation in the low-income housing areas and slums where most of the over-crowding has occurred resulting in a much higher occupancy rate.

However, since liberation the Government has constructed about 4,500 semi-permanent units in Dacca City for low-income groups, which has partly reduced the housing demand of this group. But yet, the present shortage remains considerable and the total requirement of dwelling units by 1977-78 will be around 700,000 units and approximately 70 lakh by the turn of the century, assuming the urban fraction of population to be 5 crore.

It may also be mentioned here that the total urban land to be developed for housing the estimated increase in the urban fraction of population by 1977-78 is about 43,000 acres or 70 square miles at the rate of overall town density of 100 persons/acre. By the turn of the century the requirement will be about 4,50,000 acres or 700 square miles.

The analysis showing the magnitude of requirement of dwelling units to be built during this Plan period and by 2000 A.D. indicates the tremendous effort needed to meet the requirement. It can best be visualized, perhaps, by saying that the building effort needs to cope with the construction of more dwellings by the end of the century than exist in present-day Bangladesh. The requirement being collossal a long range programme based on rational analysis and study is needed to meet the demand. In this Plan period we can only direct our efforts and resources towards the short-term objectives of (*a*) partially off-setting demand and (*b*) evaluation of this programme for framing long-term strategy and policies.

To achieve the short-term objectives the following programmes will be undertaken:

- Building of multistoried apartment houses within the urban areas for low and lower middle income groups in the Public Sector.
- Building of minimum shelters in a planned environment.
- Development of "Sites and Services" Schemes through the Urban Development Agencies and local bodies for building apartment houses.
- Organisation and financing of Cooperative apartment houses.
- Providing a planned environments for temporary settlements as temporary measures with a view to develop these into proper housing estate in future.

- Framing adequate legislation and building bye-laws, Housing Codes for guiding and controlling the development.

C. *Community Services and Facilities*

The term housing does not mean only a shelter or a house; in its wider sense it embraces dwelling units and a network of all other services and ancilliary facilities such as water supply, drainage and sewerage, garbage disposal system, power supply, transportation system, health services, educational and recreational institutions and facilities, shopping centres and market places. But the provision of these services and facilities are either totally inadequate or non-existent both in the rural and urban areas and they warrant immediate attention.

1. Rural Water Supply

The position of potable water supply in the rural areas is alarming. There are at present only 1,85,000 tube-wells in the country sunk by the Public Health Engineering Department which is the only organisation responsible for rural water supply. The present figure works out to 375 persons per tube-well. This itself is grossly inadequate. The situation has become further aggravated due to the choking up of a sizeable fraction of the total number of tube-wells. In the saline belt and haor areas shallow tube-wells have been largely unsuccessful and the resources for deep tube-wells scant. These areas are, therefore, primarily dependent on surface water supply. As a consequence, large numbers of the population fall victims to gastroenteric diseases and other ailments. There are no available statistics of incidence of these diseases and duration thereof but had there been an assessment, the national loss in terms of man-months would be found to be staggering.

2. Rural Sanitation

A satisfactory excreta disposal system in the rural area is still non-existent. The only effort to date has been in the form of supply of water-sealed slabs by the Public Health Engineering Department for excreta disposal and that too on a pilot basis in only ten thanas. Although this has been found satisfactory and acceptable to the villagers, no large scale effort could be made due to resources constraints. Tremendous increase in population and consequent sanitation problems have posed a menace to the health of the people.

3. Urban Water Supply

Only a fraction of the urban population has access to piped water supply while a large part of the urban population wash and drink from ponds. According to the 1961 census there were 76 urban centres which might have increased to 100 at present. Piped water supply is available only to 30 of these urban agglomerations. Agencies responsible for supplying water are Water Supply and Sewerage Authorities in Dacca and Chittagong while the rest of the urban areas including Khulna are supplied by the Public Health Engineering Directorate. In the rural areas, at least water for domestic purposes is easily available. The urban dwellers, being deprived of this facility, have to depend by and large on piped water supply for all their needs. The consequences of non-availability of water in the urban areas is therefore more hazardous in terms of health, sanitation and welfare of the citizens.

4. Urban Sewerage Disposal System

Piped sewerage systems are virtually non-existent in this country except in Dacca where the Dacca Water Supply and Sewerage Authority is responsible for it. In most of the urban areas sewage disposal is affected through septic tanks and service latrines on a limited scales

This arrangement is not only uneconomic and unsatisfactory but the number of people who can benefit from this kind of services is also severely limited. This results in a frequent breakdown of such arrangements. Most of the sewage however goes into open drains and the effluent evaporates or disappears through seepage, thereby polluting the environment.

5. Drainage

Only a fraction of the urban population has access to open drains for general drainage purposes. Drainage of storm-water and domestic waste is also very poor and streets and houses premises are often flooded posing a threat to public health. Water Supply and Sewerage Authorities in Dacca and Chittagong will look after the drainage problems of both the cities.

6. Garbage Disposal

The traditional method of garbage disposal (collecting and dumping) is gradually proving to be unworkable in the large cities due to non-availability of suitable dumping land within easy access. This situation has further deteriorated due to expansion of built up areas of the cities requiring larger and longer haulage of the garbage. This system is satisfactory only to a certain size of town beyond which it becomes uneconomic and unworkable. Large cities essentially require more modernised arrangements for disposal.

7. Open Spaces

There exists an acute shortage of open spaces, parks and playgrounds and other recreational facilities both in the large cities and smaller urban centres. The lack of recreational facilities is resulting in an increase in the rate of crime and delinquency.

8. Urban Transportation

Urban transportation facilities had been quite inadequate in the past. The facility almost totally broke down after the War of liberation due to destruction of vehicles by the Pak Army. The situation had improved to a certain extent due to efforts by the Government to add to public transportation facilities, but this still has a long way to go before any reasonable standard of public transport is realised.

9. Fire Service

The need for fire protection services being directly proportional to the extent of urbanisation, the extension and expansion of this service should have been proportional to urban growth. This could not be achieved in the past. Moreover, due to destruction of fire fighting vehicles and equipment during the War of Liberation, this organisation has been severely handicapped in achieving its desired efficiency. This implies that the risk of loss of properties due to fire incidences is much greater today than ever before.

D. *Government Offices and Institutional Buildings*

1. Present Position

The requirements for Government offices and buildings are extremely urgent. After the War of Liberation the need for office accommodation to house the expanded and increased number of Ministries of the National Government has posed a serious problem for the efficient running of administration. Even previously, the situation was far from satisfactory, as was evident from the fact that a great number of Directorates and other offices had to be located in scattered and rented

buildings. The current demand has increased so much that the previous arrangement of rented office accommodation cannot fulfil the needs effectively. In the face of extreme shortage of office accommodation, the Government is not only paying very high rent for hiring private accommodation but the offices are scattered all over the large cities creating serious logistical problems. Moreover, the Ministries with their Secretariat cannot be spread all over the city without having serious dysfunctional effects. Therefore, a minimum office building programme at least to house the Central Secretariat and the Ministries will be provided within this First Five-year Plan. Building should simple and functional in design.

There remains a popular demand for construction of certain institutional buildings and monuments to project the nation's aspiration and to symbolize the national heritage and liberation struggle.

2. New District Headquarters

The Government have adopted a definite policy of decentralized administration with the objective of taking administration closer to the people. This has led to the conversion of former subdivisions into districts. The existing physical facilities of these subdivisions, thus needs to be expanded to cope with the new responsibilities which have devolved on these subdivisions. In total there will be 58 districts out of which 19 districts headquarters have most of the necessary facilities for functioning as administrative headquarters. Out of the remaining 39 districts (proposed), a few of them are expected to be able to accommodate district administrative offices in the existing subdivisional headquarters. But in the rest of the newly created district headquarters some essential facilities are to be provided for the efficient functioning of administration.

E. *Metropolitan Development Agencies*

In the wake of rapid urbanisation in the late fifties in the large cities such as Dacca, Chittagong and Khulna, the need for planned and controlled development of these urban areas was keenly felt. This resulted in the establishment of Urban Development Institutions with the following objectives:—

- Preparation of Master Plans.
- Implementation of major schemes for development of roads, residential and commercial areas; community facilities such as open space, parks and other recreation spaces, etc., as envisaged in the Master Plan.
- Planning and development control.

As sufficient trained planners were not available in the country at that time, international assistance under the Commonwealth Programme was obtained and Master Plans were prepared for Dacca, Chittagong and Khulna between 1958-1961.

These agencies were able to implement partially some of the Master Plan roads, build a few commercial areas and develop a number of upper income residential neighbourhoods. Their record of achievements has fallen far behind expectation especially in the field of planning and development control and also in creating open spaces, parks and other recreational facilities.

Reasons for this lack of success have been primarily attributed to the following facts:

(i) Grossly inadequate number of planning professionals in these agencies for the preparation of plans and detailed layouts; proper and viable project formulation and imposition of effective development control.

(ii) Unrealistic financing policies of the Government in the past which required all the schemes of these agencies to be self-financing including the schemes for development of roads, open spaces and recreational facilities.

(iii) Inadequate financing.

(iv) Sketchy legislative support.

(v) Class pressures which directed the attention of these agencies to development of land primarily for upper-income housing.

After the emergence of Bangladesh the prevailing objective conditions demand a fresh look at this role and a vigorous effort for reconstituting these Metropolitan Development Agencies. Dacca being the National Capital merits special treatment. The previous Master Plan for Dacca prepared almost 14 years back has become totally outdated. Moreover, the territorial limits of the urbanising zone of the city and the growth of industrial area have long since passed beyond the Master Plan boundaries. With the raising of the status of this city to that of a national capital with its associated problems and requirements, it merits special attention. But the organisation in its present shape is inadequate to cope with the diverse problems of a metropolitan region.

Lack of co-ordination of physical development activities at the implementation stage has also given rise to various problems causing considerable difficulties and suffering to the citizen apart from causing unnecessary wastage of resources. So that need for fusion of different organisation and implementing agencies operating within the greater Dacca region into a *Metropolitan Regional Planning and Development Authority/Authorities* for the purpose of planned development has become imperative.

In the case of the two port cities of Chittagong and Khulna the same approach needs to be taken in the light of the recent growth rate, future prospect of rapid urbanization and added importance of these two vital gateways to the nation. Therefore, equal importance for planned development of these growing metropolitan areas must be given. Further, it is expected that the high rate of growth of industries in these two port cities is expected to continue unabated during the Plan.

12.3 STRATEGY

A. *Introduction*

The compelling necessity of rehabilitation and reconstruction of the war-ravaged economy, solution of the most urgent food problems and restoration of the communication and transportation infra-structure have to be given precedence over social sector investments. In view of overall resources limitations, after meeting the investment needs of these vital sectors, it is not possible to meet the full social sector investment needs. As such this sector is accorded a lower priority at least during the First Plan. This compels this sector to go for rigorous priority selection of programmes after a thorough evaluation of the available options.

B. *Institutional Development*

The programmes for institutional development are essentially of an institution building nature. The real constraint in this field is shortage of qualified technical manpower. The major tasks for physical planning institutions are preparation of a national physical planning and development strategy, regional development plans for all planning regions including metropolitan, regional, development planning and urban development plans for municipalities, urban centres and industrial complexes. The acute shortage of qualified planners either in the Public or Private Sector compels us to include only a minimum programme which can be handled by the local planners with possible international technical assistance. The priority areas thus selected are:

- Preparation of National Physical Planning and Development Plans.

- Regional Development Plans specially for the National Capital Region and if possible for another planning region.

- Urban Development Plans for a number of selected urban centres, industrial complexes and new District Headquarters.

Since the shortage of qualified planners compels us to limit our programmes cutting short even some of the urgent and pressing needs, adequate and immediate steps must be taken to enhance the capabilities of the Faculty of Architecture and Planning of the University of Engineering and Technology by way of obtaining teachers from abroad on a priority basis. To encourage larger enrolment, certain incentives in the form of scholarships, better job opportunities, etc. are to be provided. In addition, a number of professionals in the field should be sent abroad for advance training so that they can eventually replace the foreign experts.

In case of Housing and Building Research Centre, organisational deficiencies and manpower shortage are the major constraints. Immediate efforts are to be made to obtain the services of a team of international experts to make the centre immediately operational and to train up local research personnel. Foreign training of adequate number of research personnel needs also be taken up on an emergency basis.

The Housing and Building Research Centre should be enabled to link up with other foreign research institutions in the field in order to launch joint research projects and thus economise on the cost and manpower needs.

Extensive research for utilisation and improvement of local as well as new building materials shall be given a high priority.

During this Plan period the modest programmes that are being taken up will hardly touch the fringe of the total problems of Physical Planning and Housing. However, in the successive Plan periods much bigger efforts will have to be made for making up much of the leeway within the framework of a long-term perspective for sectoral development. The data needed for preparation of a perspective plan are non-existent. Two basic surveys must be conducted as soon as possible to collect basic data on rural and urban housing.

C. *Housing*

1. Rural Housing

In relation to the dimensions of the problem the meagre available resources limit us from launching any substantial programme of rural housing during this Plan period. However, we can make selective thrusts especially in evolving new institutions and in the extension of services and facilities in order to improve rural living conditions. In addition, a number of pilot projects can be taken up for testing the viability of planned approaches to rural housing and settlement.

Rural housing must be tackled as an aspect of overall rural development. As such the IRDP should be broad-based to include housing as an important area of its responsibilities. Since the cooperatives have already been identified as the institutional agent for implementation of the IRDP, the following arrangements are foreseen:

(i) The primary cooperatives at the village or union level would be used for motivation, construction, maintenance and management.

(ii) The federation of primary cooperatives (TCCAs) at thana level would have a regular housing section. This section would assess the loan requests by the primary cooperatives including credit-worthiness of individual applicants and process the consolidated loan requirements for obtaining funds from National Credit Institutions. The TCCAs shall also be responsible for supervision of utilisation of such credits by the primary cooperatives, procurement and distribution of building materials, and provision of technical assistance.

(iii) While for the purpose of rural development, the TCCAs are federated to the National Federation of Cooperative Societies, for the purpose of housing, these should be affiliated to the National Federation of Housing Cooperatives to be set up under the Ministry of L.G., R.D. and Cooperatives.

Financing of rural housing activities through cooperative societies may be done by creating a new financing institution styled as Cooperative Housing Finance Corporation. This will also serve to finance the urban cooperative apartments.

The Government can assist the cooperative housing movement in a variety of ways. To stimulate the further development of cooperatives, Government may provide incentives in the form of acquisition of land for the benefit of Housing Cooperatives, certain preferential treatments including exemption from registration fees, stamp duties, etc.

The deficiencies of present drinking water supply are to be mitigated by providing at least one shallow tube-well for every 150 persons. In special areas where shallow tube-wells are not successful deep tube-wells will be provided. Materials and supervision of the installation of tube-wells will be done through Public Sector investments. However, local communities will have to provide land and labour and accept responsibility for the maintenance of the tube-wells.

Elementary rural sanitation programme shall be extended along with public health campaign explaining the methods of ensuring minimum standards of sanitation. The material component of the water-sealed slabs shall be provided by the government but local labour will have to be provided to fabricate and instal the slabs.

The improvement of rural settlement patterns shall be attempted on a pilot basis through the development of a number of rural service centres. Viability of model village concepts will also be tested to help evolve a long-term strategy through the evaluation of these projects. The Ministry of Local Government, Rural Development and Cooperatives shall sponsor and oversee the implementation of these projects.

2. Urban Housing

Since the low-income groups constituting 85 per cent of our urban dwellers cannot afford to build or even pay an economic rent for houses conforming to bare minimum standards, it is imperative that the public sector must launch programmes for providing housing for this class of people. The whole capital cost of this entire programme must be subsidised partially or in full depending on the nature of the housing.

Construction of multistoried flats and minimum shelters for the low-income groups is viewed as the desirable long-term solution of the problem especially in view of the extreme scarcity of buildable urban land and the economy that can be derived in provision of services. However, in the First Plan period the housing backlog is so large that investments in high-rise apartments may prove, at current costs, inadequate to make an impact on the problem. For this reason low-income housing will have two components:

(i) Multistoried apartment housing providing a higher standard of accommodation.

(ii) Nucleus shelters providing pucca accommodation of a basic sort at a much lower unit cost than the apartments. These will seek to house about 40 families per acre in shelters within about 80 square yards of space. Sanitary, recreational and other facilities will have to be communally provided.

The low-income housing construction is to be located within the core and inner periphery of the cities while sites and services schemes for cooperative apartments can be located outside the inner periphery and beyond that. It is required that transportation services be simultaneously provided for commuting residents of these peripherial housing estates.

For lower-middle and middle income group housing the Plan strategy is to promote co-operative apartment housing. For this, land will need to be developed under the sites and services scheme by the metropolitan agencies along with layout and building plans prepared by these agencies. Co-operatives will need to be organised to generate savings, mobilise finance from public sector, financing agencies and organise construction according to the plan of the agencies.

The modest industrial workers' housing programme that is to be launched during this Plan period shall be financed from the profits of the public sector enterprises supplemented by loans from the public sector finance institutions. A combination of dormitory type and family type accommodation are to be provided under this programme.

For those low-income groups who cannot be accommodated in the proposed housing schemes, special sites will have to be set aside for location of planned Temporary Settlements. These planned settlements will have to be provided with basic services.

Provision for nucleus housing by private persons will be there in the Plan. The large numbers of as yet unbuilt nucleus plots in the urban centres will be available for this type of construction. For this reason as also because of the social policy of the Government no new sites for nucleus housing will be developed during the Plan. The HBFC will continue to finance this form of housing construction.

The general strategy with regard to development of urban services and utilities is to achieve completion of on-going projects and optimum utilisation of capacities of existing installations.

A small networks of water supply shall, however, be established in those urban centres where no such system exists.

Development of a modern sewerage system shall be limited to the capital city of Dacca and feasibility and other studies in connection with establishment of such services in the other two metropolitan cities shall be completed during this Plan period.

Strategy for government housing will be directed towards eliminating the distinction between planned public housing and special housing project for government servants. To this end the following course of action is proposed:

(i) Government servants will be encouraged and organised to form housing cooperatives, which will build apartment houses for its members under the cooperative housing programme.

(ii) On-going construction work for public servants will be completed. This must reflect the austerity required of a socialist commitment.

(iii) Abandoned houses now under state ownership will be progressively vacated to meet the needs of government servants.

(iv) This process needs to be accelerated by vigorous law enforcement assisted by a policy of relocating bonafide war victims and genuinely needy families in the government and cooperative housing schemes. It is expected that some 5,000 units in Dacca city alone will be available for this.

(v) Those abandoned houses which the government, *ad interim*, decides to allot legally to various private persons should be made to pay a reasonable rent to the government.

(vi) This fund should be used for maintenance and renovation particularly when they are vacated to house government servants.

(vii) Where feasible, structural changes should be carried out in houses and larger flats designated for government servants with a view to provide more apartments. For this some investment will be required.

(viii) It is expected that the very substantial building programme envisaged in the Plan will divert a part of the housing demand of public servants who for the first time will be able to get reasonably priced accommodation in the metropolitan cities at least.

(ix) A small provision is being made for construction of government housing in those towns where no abandoned properties are likely to be at hand to house government servants.

12.4 INSTITUTION AND POLICIES

A. *The need for Integrated Development*

In view of scarcity of resources and possibility of severe pressure of population on land the need for planned utilisation of the non-expandable land resources has become a national imperative. A beginning should therefore be made right from the First Plan period to identify the eventual institutional and organisational infra-structure which will enable us to plan land use more efficiently. Planning institutions will be required to cope with this task. Preparation of a national physical planning and development strategy is deemed to be an important task during the First Plan period. Regional planning is another area which needs immediate attention particularly for the metropolitan regions of the country. Co-ordination of sectoral development activities in matters of actual physical development must also be ensured in order to avoid wasteful time-lags in complementary development. Necessary institutions have to be set up to cover these responsibilities. The following institutional developments are proposed:

Possibilities of creating a special agency for Physical Planning should be studied in all its aspects with a view to assuming all responsibilities for physical planning of the environment. They will formulate policies and administer related programmes and institutions dealing with physical planning. This agency and its work cannot however, divorce itself from the process of local Government. Given the objective of decentralising administration and decision making local bodies must be closely involved in plans for land use and their authority must be involved to give executive effect to such plans. In the future the prospect for transferring all construction work to local authorities may be seriously considered.

The existing Urban Development Directorate in the Ministry of Public Works and Housing may form the nucleus of this Division but with two components covering Regional Planning and Urban Planning.

The Physical Planning Division shall be made responsible for the following:

(i) Preparation of Regional plans including Metropolitan Regional Plans,

(ii) Approval of the District Plans.

(iii) Preparation of Urban Development Plans for Municipalities, industrial complexes and other urban centres.

(iv) *Ad interim*, it may also have to scrutinise Thana Plans.

The mere preparation of plans will not ensure integrated and coherent development. New governmental structures are needed to be created or the existing ones substantially strengthened in order to exercise development control and guidance. The Thana Development Coordination Committees and the Zilla Development Coordination Councils that are being proposed by the Ministry of Local Government, are the logical structures through which both preparation and implementation of the Thana Development Plans and the District Plans could be carried out. It is noticeable that structures for development coordination at regional level (supra-district level) are missing from the proposed local government structures. If regional development plans are to be prepared and administered properly, then creation of a Regional Development and Coordination Council becomes unavoidable.

For the purpose of preparation of Plans and their approval the following procedures are suggested:

1. Regional Plans including Metropolitan Region Plans

The Regional Planning Directorate of the Physical Planning Division will directly undertake preparation of such plans and these plans will be approved by a Physical Planning Council of the Government.

2. District Plans

These plans are to be prepared by planners from the Regional Planning Directorate of the Physical Planning Division. As local institutions and resources develop, this task may be taken over by professionals in the service of the Zilla Parishads. Assistance from the officials of all nation-building Ministries and Agencies in matters of surveys, collection of data and plan formulation must be ensured by involving these officials in the district coordination councils.

The District Plans as and when prepared shall be approved by the Regional Development Coordination Councils. Until such times as these Regional Councils are set up the Physical Planning Division of the Ministry of Physical Planning and Local Government will be the approving authority of the District Plans.

3. Thana Development Plans

These plans should be prepared by the Thana Parishads who must equip themselves for the task. Till they do so staff assistance may be provided by the Physical Planning Division. The approving authority for these plans should be the Zilla Parishads. These plans will be integrated into the Zilla Plans.

4. Urban Plans

The preparation of Urban plans should ideally vest with the local bodies. Since some kind of structures are generally available in the shape of Town Committees, Municipalities, etc., the responsibility for plan preparation and implementation can be carried out by these bodies, initially with assistance from the Physical Planning Division. For providing required assistance an Urban Planning Directorate under the Physical Planning Division needs to be set up immediately. The approval of the Urban Development Plans can be vested with the Physical Planning Division.

An Urban Development Co-ordination Committee and District Co-ordination Committee should be set up for co-ordinating physical development activities as detailed later.

B. *Organisation and Structure of the Physical Planning Division*

The creation of the Physical Planning Division in itself will not be effective unless various steps are taken to create the internal structure of this Division and to man them with appropriately trained man-power. Immediate steps must be taken to launch a crash programme for planners' training under more than one University in the country. This may require external technical assistance. The crash programme should aim at producing planning personnel at undergraduate level as well as at graduate level. The training of planners at undergraduate level through a condensed one year course will enable the Government to place para-technical

personnel at the Thana level in the course of the next five years. Planners at the District level of necessity should be better trained and more experienced.

For carrying out the internal planning and design responsibilities associated with execution of projects, an Architecture Planning and Design Directorate will need to be set up. The functions that are to be carried out by this Directorate are :

- preparation of site plans;
- preparation of detailed layout plans of housing estates and office complex;
- building and Housing planning and design, etc.

In accordance with the plans and designs prepared by the Directorate of Architecture and Planning the construction Directorates of the Ministry of Public Works and Housing will be responsible for the following:

(i) All administrative construction should be entrusted to the Buildings Directorate.

(ii) All Public Sector housing should be entrusted to the Housing Directorate.

(iii) This implies that the P.W.D. inherited from the erstwhile Central Government of Pakistan should be dissolved and its responsibilities divided up as between the two above agencies.

(iv) The Development authorities' building and housing construction responsibilities should be bifurcated between these two Directorates.

(v) Sites and services functions including development of parks and other spaces, which is to remain ad-interim with these agencies, should eventually be entrusted to a separate directorate in the Public Works and Housing. In the metropolitan cities until such times as the Metropolitan Planning and Development Authorities are set up the existing urban development agencies will continue to be responsible for these functions.

(vi) Dacca and Chittagong WASA may continue with this Ministry but once the development work is completed administration of water supplies and sewerage must vest with the Municipalities.

(vii) A full fledged estate office will need to be set up as a separate agency within the Ministry to play the role of landlord to all the housing under the Ministry.

(viii) Road building functions have no logical place in the Ministry of Public Works and Housing and should be vested in the Roads and Highways Directorate.

The overall physical planning of the geographical space of Bangladesh will continue to be intimately related to the social and economic planning currently carried out by the Planning Commission. Since a national physical plan is essentially a physical counterpart of the economic plan prepared by the Planning Commission it would be advisable to institutionalise this inter-relationship.

1. In the interim phase the Physical Planning and Housing Section should be raised to the status of Division in the Planning Commission. Its staff will have to be expanded and external

assistance invited to enable it to begin work on drawing up national physical plans for the annual, five year and longer term time phases and also for rational delimitation of the planning regions.

2. For the future it may be considered whether an institute of physical planning may not be created to embrace the very considerable responsibilities implicit in this task. This may continue to be in the Planning Commission.

As things stand, a general state of anarchy prevails in most urban areas in terms of physical construction. Power, sewerage, water, gas, road building maintenance, housing are carried out by different agencies. This involves duplication of work, wastage of resources and massive inconvenience to the public.

It is now time to coordinate all physical works as far as possible within particular areas. For this a National Physical Development Council should be set up with high level representation of the relevant agencies.

The Council should coordinate all construction plans of the executing agencies represented on the council. The idea would be to see that all physical construction in a particular area should be carried out on a coordinated basis. For this both release of funds and working out of a construction strategy will be needed. This may be coordinated by the council.

In the Five-Year Plan a number of metropolitan authorities in Dacca, Chittagong and Khulna may emerge. These authorities may have all functions and responsibilities assigned to the Council delegated to them.

Local authorities must be equipped to play their role in this sector.

In the interim phase all development works should vest with the various designated Ministries/Agencies. Where there is as yet no national network of services, the local authorities must take over the administration of such services as water supply and sewerage where the development programmes are completed by WASA and DPHE. Local authorities should continue to build local roads under the works programme and non-arterial R. H. roads in Municipal areas may also be maintained by them.

The institutional arrangements for the Public Health Engineering programme needs to be re-assessed. Under the present arrangements, the entire administrative and financial responsibility for sinking tube-wells and maintaining them vests with PHE and is to be financed through the development budget to the extent of Taka 38·50 crores during the First Five-Year Plan. As part of our programme of development responsibility to local authorities with a view to mobilising local resources, both human and material the following institutional changes are proposed for executing this programme:

(i) PHE will determine on a district-wise basis the number of tube-wells to be sunk every year.

(ii) District authorities will then indicate to the District PHE the sites where tube-wells will be sunk in the district.

(iii) The PHE representatives will then study these siting areas and on the basis of ground water conditions will indicate whether the site is feasible. If the site is technically unsuitable PHE may, in consultation with local authorities, identify an alternative site. In all matters of siting, PHE's judgement should be final.

(iv) Once the site has been identified, it will be the responsibility of the Union Panchayat to see that the land on which the well is sited is made over to the Panchayet from the owner either on contribution or through payment from funds locally mobilised.

(v) All labour must be of local Union. It may be mobilised in all or part on a voluntary basis by the Panchayats. Alternatively the Panchayat may impose water cess to pay for the labour and even land costs.

(vi) As and when land labour are at hand, Union Panchayat will inform the District Panchayat who in turn will formally notify the District PHE.

(vii) On this basis an annual sinking programme may be drawn up by PHE and the District Panchayat.

(viii) On the basis of this programme the PHE will deliver tube-well materials and installation equipment to the site.

(ix) PHE will provide services of a technically qualified hand to supervise the labour provided by Union Panchayat in sinking the well.

(x) Union Panchayats will be responsible for maintenance of all tube-wells installed under this programme.

(xi) where materials and technical services are required the Union Panchayat will approach the District Panchayat to secure these from the PHE.

(xii) During the first plan period these materials will be provided under the budget as a grant.

(xiii) For the future, Union Panchayats must be ready to pay for maintenance. This will ensure greater discipline in routine usage and maintenance.

(xiv) Where Union authorities have failed to mobilise land/or labour within 3 months of the actual siting decision passed on to them, the district authority will reallocate the tube-wells to a different Union.

(xv) If the entire district falls short of mobilising labour and/or land needed to fulfil the tube-well sinking targets allocated to it at the beginning of the budgeting year within six months of the allocation, PHE will reallocate the wells to another district.

(xvi) The PHE must suitably strengthen its district offices with technical hands of various qualifications to ensure prompt discharge of their responsibilities.

(xvii) The District Panchayats should also have on their staff skilled personnel to supervise routine maintenance of the wells. Eventually when local authorities are adequately equipped they may take over all responsibilities currently vested with PHE except for the task of inter-district allocation.

The Rural Sanitation Programme will continue to be vested with the PHE who will continue to educate the rural population on the subject. They will also fabricate the sanitary installation and make it available to the public on a subsidised basis. Since the idea is as yet experimental it may be advisable to let this arrangement continue for the five year period. However, once the benefits of the programmes have been made manifest it may be considered whether the responsibility for fabrication may not be taken over by the District/Thana authorities. These may initially be provided with material and technical supervision by PHE, but even these tasks can be taken over locally.

A National Council for Housing and Building Research consisting of eminent people in the fields of housing, building and planning should be immediately set up with the objectives of—

- identifying areas of research;
- approval of research programmes; and
- appraisal and evaluation of research activities.

The status of the Housing and Building Research Centre should be that of an autonomous body like other scientific and technological research institutes in the country. It should be placed under the Construction Division of the Ministry of P.W. and Housing to ensure close coordination between actual construction and research relating to it.

Incentives in the form of status, salary and other benefits should be provided in order to attract as well as to retain talented management and research personnel.

C. *Cooperative Housing, Finance and Other Shelter Programmes*

The problem of shelter is acute throughout the urban areas, particularly for the low and lower middle income groups. It is incumbent upon the government to devise schemes to meet the shelter needs of these income groups, and to the maximum extent possible harness and mobilize private resources and initiative in attacking the problem. However, shelter, housing and cooperative housing programmes must not be dealt with in isolation, but rather in the entire context of the urban process, namely employment, transportation, sanitation, schools, commerce and water supply. In so far as possible the policy of the Government shall be to avoid subsidies to middle income groups and limit the application of such subsidies to the lower income sector of our society.

In broad terms Tk. 100 crores is envisaged for expenditure for cooperative housing and shelter programmes during the Plan period. The kind of programme and housing contemplated will largely be determined on the basis of the payment capacity of a particular income group.

Cooperative housing must not be seen as merely an administrative format but a way of life for the member of the cooperative communities emerging out of this programme. A move into cooperative living will logically lead to cooperative provisions for services, marketing, transport and eventually production for the cooperative communities. This will in itself have a significant impact on the social structure of the community and can only be carried through successfully

within the framework of a socialist commitment. Since socialism is now a declared objective of the Government and the Five Year Plan is an instrument to this end the institutions proposed over here are a concrete expression in the housing sector and of the overall philosophy of the Government.

Institutional arrangements will be required to successfully execute the programme. In order to provide an overall direction for this programme it is proposed that a *Cooperative Housing Advisory Board* be constituted. The Board will include representatives from concerned Ministries, agencies, institutions and the cooperative housing movement.

The Board will provide policy guidelines for the national programme including, but not limited to, the following:

- The development of a national strategy and policy regarding shelter and housing.
- The income levels and classes of people to be served.
- General terms for mortgage lending by the Cooperative Housing Finance Corporation and terms and interest rates on savings and investments in the CHFC by individuals and institutions.
- Determination of subsidy for different groups, and identification of sources for such subsidies.
- The allocation of public sector funds to be used for shelter programmes, including share capital and debt capital to be made available from public agencies, the nationalized banks and insurance companies, etc., to the CHFC.
- Advice on coordination of housing programmes with national, regional, and metropolitan and planning agencies, municipalities, and the development authorities.
- Recommendations to the Planning Commission regarding external multi and bi-lateral aid agencies to identify capital and technical assistance resources for the programme.
- Criteria and priority for importation of essential building materials.

The Board will designate the initial Board of Directors of the Cooperative Housing Corporation (CHC) to be comprised of 6 to 9 members. It shall include representative from the cooperative housing movement obtaining assistance from the Cooperative Housing Corporation, and suitable arrangements should be made for the gradual turning over of control and ownership to the cooperative housing sector as viable cooperatives are spawned. The Board of Directors should also include representation from the CHFC. The CHC will be the executing organization for the sponsorship, development, implementation, and management of cooperative housing programmes. It shall be an autonomous body corporate with full powers to transact and conduct business operations within a defined framework as set forth in the bye-laws. The Board of Directors shall appoint an Executive Director who shall have full responsibility for managing the organization. Arrangements will be made to provide CHC with an initial grant of an amount of Tk. 20 lakh as start-up capital over a period of three years. It shall operate as an economically viable and self-sustaining organization in accordance with its charter and bye-laws, and on behalf of the cooperative and non-profit housing sectors. To assure orderly and integrated development of its responsibilities CHC shall coordinate its programmes with the

Ministry of Public Works and Housing, the Planning Commission, the Ministry of Physical Planning and Local Government, the Ministry of Cooperatives and Rural Development, the regional, metropolitan and municipal planning bodies.

The Cooperative Housing Corporation will carry out or make arrangements for carrying out the following activities on behalf of prospective or existing cooperative groups:

(i) Market analysis to determine groups and types of housing programmes, identification of social groups, socio-economic studies, etc.

(ii) Site identification for housing programmes, and development of appropriate site plans to conform to master plans, zoning and other existing regulatory physical plans.

(iii) Plans and specifications for projects, including infra-structure for projects, community, commercial and recreational facilities.

(iv) Project construction on the basis of appropriate tender.

(v) Project supervision in conjunction with designated government agency.

(vi) Cooperative and community organisation for primary cooperatives and their members including, pre and post occupancy education and training, development of savings programmes, assistance in registration, etc.

(vii) The construction and long term financing for programmes with the CHFC.

(viii) Manage or assist in managing with primary cooperatives completed housing projects, including collections, maintenance of community services, and financial and budget control of cooperatives.

(ix) Appropriate legal documentation for the cooperatives, including bye-laws, occupancy and mortgage agreements, etc.

Arrangements shall be made for auditing the CHC by chartered public audit firms and/or appropriate government agency.

The Cooperative Housing Finance Corporation (CHFC) will be established to marshall and channel funds for the cooperative and non-profit housing programme. It shall be an autonomous corporate body. With full powers to mobilize resources and dispense funds for purposes of financing cooperative housing, shelter and related urban and community development programmes. The CHFC will be controlled by a Board of Directors suitably representing the interests of the principal contributors of authorized and subscribed share capital and the interests of the individuals or cooperative shareholders and/or savings depositors.

The initial authorised share capital of the CHFC shall be 25 crore and taken up by the nationalised banks, and insurance companies, other agencies, enterprises and the general public. Legislation will be enacted to obligate specified government and quasi-government bodies to invest on a continuing basis a portion of their investment portfolio into the CHFC. The CHFC shall be authorized to float bonds and issue debentures with the backing of the government. Consideration will be given to requiring the industrial enterprises to purchase debentures from portion of their net profits.

A principal function of the CHFC will be to mobilize savings from the small, medium and large saver through a network of branches or correspondents throughout the country. Savings deposits must be guaranteed by the government in an appropriate manner.

Housing cooperatives will be entitled to receive directly or through the CHC financing for housing schemes submitted by the CHC on behalf of the cooperative. Government approval of such schemes will be a pre-requisite for loans. Lending would take place on the basis of conditions laid down by its Board and the Cooperative Housing Advisory Board.

The Cooperative Housing Corporation will also have responsibility for loan appraisal, disbursement, supervision and repayment.

The construction of housing, shelter and community service schemes shall, to the maximum extent possible, be carried out by cooperative types production enterprises.

The structure of the cooperative housing programme will be developed in accordance with generally accepted principles of cooperative movement. Essentially the CHC, in representation of prospective or primary cooperatives, will undertake the development of given schemes. It is intended in time, that the CHC becomes the national apex organization for cooperative housing. The title to each schemes will rest with the primary society. A flexible organizational and legal approach must be adopted until a sufficient body of experience is gained to clearly demonstrate and signal the most applicable, efficient and representative structure.

Within the Physical Planning and Housing Sector provision has been made for spending Taka 415·00 crore in public sector and cooperative building. Under present arrangements the construction work is carried out by private contractors. In most cases of public construction the agency concerned may provide cement, steel, bricks and even fixtures. In other cases these are provided in part or full by the contractor along with labour. If we include all other sectors involving construction work it may be reckoned that 30 per cent to 40 per cent of the entire plan expenditure will end up in the hands of private contractors. Even if we assume that the contractor makes as little as 10 per cent on a construction contract, during Plan period a sizeable sum stands to be made by these contractors.

As things stand this process is likely to raise some contradictions within a socialist system. The contractor class operating in building construction, roads and highways, tube-well installation appears likely to emerge as a privileged class with scope for making fortune substantially in excess of the distributional norms of a socialist society. In such a situation if the Government is sincere to its socialist commitment it should aim to assume responsibility for all constructional work.

In the current phase this may impose a burden substantially beyond the administrative capabilities of the Government. For this reason taking over of construction from the private sector must be based over several Plan periods.

It is, however, imperative for a beginning in this direction to be made by the Government. It is, therefore, suggested that a Construction Corporation be set up in the public sector.

This should begin with amalgamating the personnel, assets and funds of abandoned construction firms into one or more enterprises.

This Corporation should be given maximum operating autonomy to compete with private firms for public contracts.

The Corporation itself should be manned by Senior Engineers and Architects with considerable commercial experience. The enterprises under the Corporation may be strengthened by recruitment of capable professionals.

The Government may pass onto this firm sophisticated construction equipment lying around from various projects. Additional equipment and even skills may be imported to enable the Corporation to compete for sophisticated construction work now being entrusted at great cost to foreign contractors.

As with other public sector enterprises this move will rest or fall on the freedom and responsibility vested in the Corporation to make itself commercially viable. For this an appropriate incentive system including profit sharing with employees is an essential prerequisite.

To the extent that the experiment is successful and assumes responsibility for a part of the construction work in the first plan a major expansion in its scope of operations can be attempted during the second plan.

Apart from publicly owned construction enterprises a more fundamental departure in the institutional arrangements for construction will need to be developed. This will involve the local representative institutions mobilising local labour for unskilled or semi-skilled construction work within the community either on a voluntary basis and/or through generating resources locally to pay unemployed local labour. This of course involves mass political mobilisation and appropriate institutions which have been discussed elsewhere. But as this option develops this will be able to mobilise labour on a much larger scale than the contractor system in less sophisticated construction projects, which will both save on national budgetary resources and convert underemployed labour into a productive asset. In the longer run our construction strategy must aim at depending on this technique for smaller projects and public construction firms for the more complex projects.

To the extent that private contracting continues, a positive effort must be made to mop up the monopoly profits made by these contractors. The fiscal mechanism has been notoriously taxed in making in-roads into these profits. The proposals for all public sector construction tenders are therefore as follows:

(i) The tender stipultes the breakdown of costs, including profit margin.

(ii) The public sector agency passes on the details of the contract made with the successful tender, along with tender documents, to the income-tax authorities.

(iii) Income-tax authorities should keep these at hand when contractor files his returns. If he does not, I.T. authorities should follow this up.

(iv) In order to be eligible to bid for a tender, contractors should be asked to produce an income-tax clearance certificates.

(v) Where there are substantial arrears of tax, I. T. authorities may approach public agencies to withhold bills of the contractors.

(vi) All contractors should be registered. A progressively determined licence fee should be charged on an annual basis. An I. T. clearance certificate will be required for verification at the time of renewal. No unregistered contractor will be eligible to bid for public or cooperative contracts.

Private house building is likely to play a substantial role in the years to come, if it is reckoned that Tk. 35 crore will be vested in private construction during the Plan period.

A further amount of Tk. 222 crores are identified as non-monetised investment in construction of shelters in the rural and urban areas. These may involve some cash outlay in procurement of C. I. sheets, bamboo thatch and even bricks. In most cases in rural areas the householder simply uses his labour whilst he collects his materials from the countryside. Since cash outlay plays a role what we define as non-monetised is inaccurate insofar as some claim on marketable resources is made from this sector.

The Tk. 35 crore of private housing in the monetised sector is thus really a reflection of investment in more permanent structures and does not reflect the full taka outlay on construction during the plan.

Policy decisions will be required in order to regulate the type of houses built. To the extent that austerity is a national objective, such houses should be modest structures catering to middle class tastes.

It must, however, be noted that as of now there are plots in Gulshan and Banani in local hands. If we add available land in private hands in other residential areas of Dacca, Chittagong and Khulna the compulsion to build larger houses to cash in on the high rents paid by foreigners will be very strong.

Government will have to decide whether to permit this type of construction to cope with foreigners demand or to permit this scarcity to persist and develop a policy for rising house-rents. A policy of public sector luxury apartments for foreigner may be considered as another option.

It should be noted that as of now all owners of land in these areas and housecowners stand to make windfall profits out of any restriction which the government imposes on luxury building during the plan period.

Keeping in view the problems of administering any control on housing construction the following policy is proposed:

(*i*) Where feasible plots in Gulshan and Banani should be permitted to be divided up subject to a minimum unit of ½ bigha. This will increase somewhat the number of plots.

(*ii*) In order to avoid windfall gains from the sale of scarce land in Gulshan or Banani or any other area, capital gains tax rates should be very substantially increased.

(*iii*) Municipal housing rates should be significantly increased. This should aim to:

- raise substantially the rates on houses rented out as distinct from those occupied by owners.
- Having a progressively rising rate based on size and quality of the house which will discourage large and luxurious construction.

- All houses leased to foreign nationals in Bangladesh, must be done through lease agreements which should be registered with the income-tax departments in various cities. The Board of Revenue should specially designate officers to register these leases.
- All houses with a floor space of more than 1000 sq. ft. should also register their leases with the income-tax department.
- Income recorded in these leases should be scrutinised for evasion and then reflected in the tax assessments of the owners.
- A special surcharge on income from house-rent may be imposed.
- A special building permission tax may be imposed for government developed areas such as Gulshan, Banani and Dhanmandi designed to recover the increase in the value of land.

Such policies may recover to the Government some of the windfall profits currently accruing to home or landowners as a result of Government policies. To the extent that this can be re-channelled into public building programmes it will help to stabilise rents at least for middle or lower level housing. By relieving the intense pressure on existing housing space in these categories through providing public housing it is expected that a downward trend in house-rents may be initiated.

D. *Private Landownership*

Privately owned urban land is a scarce commodity whose value has increased and will continue to increase with the growth of urban population. Government policy will have to decide how far society can afford to permit this scarce land to lie idle, be used in a sub-optimal manner and provide a basis for windfall capital gains to its owner.

Landowners on the frontage of newly developed city roads have been given windfall gains in land value because land bordering the roads were never acquired. Valuable building sites are lying unutilised, or with uneconomic structures. Acquisition of such sites will impose a serious cost to the budget.

A policy, therefore, needs to be developed towards urban land. The following guidelines for policy are suggested for application during the First Five-Year Plan to the three metropolitan centres. These principles may be extended to other urban centres of Bangladesh in the second plan period:

(i) A ceiling of half an acre per nuclear family be imposed on all land within the municipal limits. Land over and above this limit may be acquired by the Government for use in Government and Co-operative sector building programmes. This may be tied in with a policy for ceiling on ownership of urban property which may seek to limit ownership in terms of number, size and value of urban housing.

(ii) A betterment levy should be imposed on all landowners whose property value has appreciated because of government infra-structure investments.

(iii) Where such levies cannot be paid within two years of its imposition the land should be acquired and the levy should be deducted from the compensation awarded to the owner.

(iv) All new construction in the three metropolitan centres should be approved by the planning agency. This approval will only be given where optimal use is made of lands sited at favourable locations.

(v) All vacant sites and sites where unauthorised construction has come after this law is put into effect will be acquired within five years of the enactment of this law. No compensation will be paid for unauthorised constructions.

(vi) Tax rates on capital gains on land values should be enhanced.

E. *Planned Temporary Settlements*

It is evident that whatever emphasis the government puts on improved housing for lower income groups will be grossly inadequate. Pressure of population in urban centres will only permit, with the resources available to the Government, the housing of a small percentage of the increment in the urban population.

It may be expected that the unaccommodated population will continue to squat in whatever space they find and will continue to generate the problems inherent in such unplanned slums.

In such a situation a case presents itself for taking this development as a fact of life and attempting to plan for it. The only option available to the government is to specially designate certain available spaces for such shelter construction. Here even if the housing cannot be planned or be up to standards at least the environment can be planned. As resources become available and income levels increase these settlement areas may be re-developed with more durable and permanent structures. It is, therefore, proposed that :

(i) The Physical Planning Division identify sites within the environs of the city where such temporary settlements can be located.

(ii) A rudimentary layout plan for these spaces be drawn up guaranteeing a certain space to each dwelling unit.

(iii) Inhabitants located in these settlements will have to enter into an agreement with the Government to vacate this land when more permanent habitation is provided to them. Land allotted will not ensure title or be transferable. Government must guarantee re-settlement at the time of eviction and must pay compensation for any investment in pucca construction.

(iv) Once planned sites are allotted construction will be the responsibility of the allottee.

(v) Goverament may build 'core' houses in some sites which will provide for foundations and roofing. These can be sold on instalment basis to the tenant. The tenant will have to invest in constructing walls and interior partitions according to his requirements.

(vi) In each settlement provision should be made to provide minimum sanitation and water supply.

(vii) Health services and schools may be set up.

(viii) If such settlements are away from the centre of the town an efficient public transport system be provided.

Each temporary settlement should aim to administer itself through co-operatives. A federation of such co-operatives may be organised with an elected president.

A special Temporary Settlement Board be created to make policy for this programme. This may consist of existing representatives from local Government, public representatives, representatives of the Temporary Settlements, construction and planning agencies.

The Temporary settlement scheme should be implemented through the Ministry of Public Works and Housing who may carry out the ground work and planning of the programme. The

Directorate of Housing will provide the support work to the Board. A block allocation should be made for providing facilities to these settlements. A ground rent should be charged to each allottee to pay for the permanent staff, service and maintenance for each area.

Once such settlements are made available any shelter construction outside these areas must be prohibited and all such shelters removed forthwith. The law enforcement agencies must enforce the policy of eliminating squatters without fear or favour. Any lapse in the discipline necessary to enforce this policy will subvert the entire concept of planned settlements.

12.5 DEVELOPMENT PROGRAMME

A. *Institutional Development*

1. **Physical Planning**

The on-going project for location and Planning of Cities in Bangladesh is in fact a scheme for preparation of a National Physical Planning strategy. This includes the preparation of a perspective frame-work for inter-regional distribution of development activities, indentification of growth poles, delimitation of Planning Regions and the preparation of one Regional Plan on a pilot basis. The Plan allocation of Taka 140·00 lakh for this project has a foreign exchange component of Taka 85·00 lakh (Table XII-1). It is expected that UNDP will provide the entire foreign exchange in the form of a grant which will be utilized for bringing in international experts, equipments and stationeries as well as for payments to international sub-contractors who will be engaged by UNDP to complete the tasks in co-operation with their local counterparts. The foreign exchange allocation also includes the provision of a number of fellowships for training local manpower. The counterpart allocation of Taka 55·00 lakh has been provided for meeting the expenditures on local staff-salary, operation and maintenance of the equipments and facilities, local surveys and general administration of the project.

The new schemes for Physical Planning that have been included in the First Five Year Plan are :

(i) Regional Planning Scheme (1st Phase)

(ii) Urban Planning Scheme (1st Phase)

The Regional Planning Scheme is partly a follow-up phase of activity which is expected to utilize the frame-work as well as methodology developed through the implementation of the on-going UNDP aided project. It, however, shall initially deal with the most pressing problem of Metropolitan Planning. Preparation of a Metropolitan Regional Development Plan for the national capital is the immediate task to be completed under this scheme. Utilisation of external assistance for this Metropolitan Regional Plan ranks high in order in the technical assistance need of the Physical Planning and Housing Sector. Of the total allocation of Taka 150·00 lakh for Regional Planning an amount of Taka 50·00 lakh in foreign exchange has been provided to account for the expected technical assistance inflow. The Taka component of Taka 100·00 lakh has been provided to build up the Regional

Planning Institution (Regional Planning Directorate) under the proposed Physical Planning Division which will enable the Government to train up and second professional and sub-professional planning staff at regional district and Thana level.

The Urban Planning Scheme envisages preparation of 20 Urban Development Plans of selected urban centres and industrial complexes. Each one of these plans is expected to cost Taka 3·00 lakh on average. As such a total allocation of Taka 60·00 lakh with a FEC of Taka 10·00 lakh has been provided for. The foreign exchange component is meant for purchasing essential survey, drawing and printing equipments and stationeries. The overhead establishment cost of the Urban Planning Directorate which is to be the executing agency for this scheme should come from the revenue sources.

2. Housing and Building Research

The on-going scheme of the Building Research Institute has already acquired a few physical infra-structural facilities such as the building and a sizable amount of equipments during the past years of its operation. The First Plan programme envisages procurement of additional equipments, essential stores of research materials and above all technical assistance in the shape of research expertise for enabling this centre to perform effectively. An allocation of Taka 50·00 lakh in foreign exchange has been provided for these essential needs. The local Taka component of 100·00 lakh (Table XII-1) is to be utilised for expansion of the staff services through a sustained programme of training and absorption of middle and upper level professionals, testing the field application of research findings both in materials and techniques through pilot projects, dissemination of research findings, and other overhead expenditures. The total allocation for Housing and Building Research thus amounts to Tk. 150·00 lakh.

3. Survey Schemes

Apart from the overall resource constraints, planning in the field of housing has been seriously handicapped due to lack of hard data. For obviating this deficiency two basic surveys on urban and rural housing conditions, requirements, and demand are to be conducted during the current plan period under the aegis of the Physical Planning and Housing section of the Planning Commission. An allocation of Tk. 20·00 lakh with a foreign exchange of Tk. 2·00 lakh has been provided for.

The total allocation for Basic Development during the First Plan period amounts, therefore, to Tk. 520·00 lakh with a foreign exchange component of Tk. 197·00 lakh (Table XII-1).

B. *Housing*

Under the "Development of Urban Land and Construction of Public Housing" programme there are 16 on-going schemes. This programme aimed at construction of nucleus houses for the refugees and development of housing plots for the general public in the metropolitan cities as well as in those district Headquarters and urban centres where there were large concentrations of refugees from India as a consequence of partition. Launched in the early sixties, most of these schemes have either been completed or are in the final stages of completion. Allocations made for these schemes are required for residual works and clearing up of the outstanding liabilities excepting in the cases of Sylhet, Bogra and Parbatipur. In the

later cases, the projects are in the initial stages of implementation and as such there is scope for revising the physical targets of these projects to suit the new requirements. This implies that construction of nucleus housing under these schemes will be discontinued and the developed residential land be devoted to construction of low-income flats and shelters through the co-operative housing programme. An allocation of Taka 807·75 lakh (Table XII-I) with a foreign exchange of Taka 37·50 lakh has been made for completion of these projects during the First Plan period.

The on-going scheme for construction of housing for the low-income groups is the major public sector programme included in the Plan. This envisages construction of 45,000 multistoried flats and shelters in the three Metropolitan cities and other selected urban centres. A plan allocations of Taka 6500·00 lakh with a FEC of Taka 1300·00 lakh (Table XII-1) has been provided for this programme.

The "Pilot scheme for introduction of precast and prefabricated structures with ordinary and pre-stressed Steel" is an on-going scheme for which most of the machineries and equipments have been procured. This scheme will help to minimise the cost of construction as well as to speed up the time-process. As such there is an urgent need to make this project operational by importing the rest of the machineries, spare parts and installation/construction workshop and yardage facilities. An allocation of Taka 75·00 lakh with a FEC of Taka 25·00 lakh has been provided for this project in the First Plan.

Under the on-going schemes of Public Servants' Housing both by Buildings Directorate and BPWD the construction works that are now in progress are to be completed in the three metropolitan cities of Dacca, Chittagong and Khulna. The on-going schemes for other areas are to be implemented in full. This policy is adopted to remove the illogical distinction between public servants housing and the general housing to be taken up under the Public Sector. Another objective of this policy is to indirectly persuade and encourage public servants to organise themselves into housing co-operatives. The on-going schemes in outlying areas are to be completed in view of the limited prospects of co-operative housing development in these places. The First Plan Allocation for these schemes is Taka 576·37 lakh of which the FEC is Taka 141·66 lakh. The total addition to the stock of public servants' housing through this programme is expected to be 1,500 units.

The on-going programmes of housing that are being implemented by the Urban Development Agencies (DIT, CDA & KDA) are in fact land development schemes for housing estates. The financing policy with regard to these schemes in the past has been to provide loans from the Public Sector which were to be repaid with interest charges. This policy has now been revised and these schemes are to be financed through funds directly borrowed by these Agencies from the Banks, Insurance Companies and other sources. The policy with regard to disposal of land developed under these schemes will be parcelling of land into sizable blocks and allocations to housing co-operatives from whom the cost will be realised on mutually agreed upon terms and condition. This in other words means that the Urban Development Agencies shall henceforth be required to operate as corporate land developers with the provision, that they would operate on a non-profit basis and allocate developed lands to Housing Co-operatives. Government shall, however, assist

them in acquiring the land for housing development. Since the institutional developments of housing co-operatives and also financing institutions and policies will take sometime, the on-going schemes of the Urban Development Agencies will continue to be financed out of public sector allocations for the first year of the FFYP period. An allocation of Taka 129·41 lakh with a FEC of Taka 14·50 lakh has been provided for this purpose in the ADP, 1973-74.

The total allocation for the on-going schemes of the housing sub-sector amounts to Taka 8088·53 lakh which has a FEC of Taka 1518·66 lakh (Table XII-1).

The allocation for additional land compensation for the scheme "Development of Urban land and construction of Public Housing-Phase I" at Dacca is required to finally settle the claims of affected landowners who, for various reasons, could not get their full compensations during the past years. This issue, which affects a large number of people was taken up at the highest level and the decision was taken that the claims of the affected people should be finally settled with despatch. Since the original scheme provided for a much smaller component of land compensation and since the scheme has been virtually completed, it was decided that instead of revising the scheme final settlement should be done through a separate new scheme. The total allocation for this purpose is Taka 500·00 lakh which does not involve any foreign exchange.

The Housing Directorate will be required to execute a massive programme of low-income housing for which corresponding administrative and technical services will have to be expanded at the Headquarter level. This will require additional office space for this Directorate. As the existing office building of the Housing Directorate has the structural provision of vertical expansion by another two floors, it is economical to provide for a scheme for construction of these additional floors. This will also optimise the original investments in foundations, structures and services made in this building. An allocation of Taka 14·00 lakh with a FEC of Taka 3·50 lakh has been made for this new scheme.

There are only three new schemes of Public Servants' Housing included in the Plan. Of these one scheme alone accounts for Taka 400·00 lakh out of a total allocation of Taka 429·00 lakh (Table XII-1). This scheme envisages construction of Public Servants' Housing primarily for the Class III and Class IV employees in areas other than the three metropolitan cities of Dacca, Chittagong and Khulna. The physical target set for these schemes are:

(i) Construction of 1600 units of flats.

(ii) Gas connection to Government staff quarters.

(iii) Construction of six Officers flats at Bangabhavan.

The total allocation of Taka 429·00 lakh includes FEC of Taka 91·80 lakh.

Under the programme of Pilot projects for Model Villages and Rural Service centres a total number of 17 model villages are to be built—5 in the coastal areas and 12 in other regions of the country. Under the model village programme the following physical work is envisaged for each one of the 400 family strong nucleated settlements:

(i) Acquisition and development of 40 acres of land.

(ii) Construction of CARE type nucleus houses.

(iii) Community water supply and sanitation facilities.

(iv) Village roads and drainage works.

(v) Organised space for schools, playgrounds, shopping and community centre.

While the actual financing and construction of these model villages are to be done through Public Sector Agencies, it is expected that organisation, motivation and management will be handled by the Co-operative institutions. Each one of these model villages is expected to cost Taka 30·00 lakh on average.

Under the Rural Service centre programme the following works are envisaged with the view to create nucleus for new townships:

(i) Physical reorganisation and extension of some key markets with potentials for rapid growth to be selected by Zilla Boards.

(ii) Acquisition and development of 10 acres of land for cottages, Industrial sites, sites for community institutions such as schools, colleges and community centres, etc.

(iii) Acquisition and development of 10 acres of land for residential purposes.

(iv) Provision of services and utilities including electrification.

The financing and construction of the above facilities are to be done through the Public Sector. Organisation, motivation and management in this case are to be handled by appropriate Co-operative institutions. A total number of 20 such centres are to be taken up for development during the First Five-Year Plan. Each of these centres may cost Taka 30·00 lakh on average. The total allocation for the Pilot Projects of Model villages and Rural services centres amounts to Taka 1125·00 lakh with a FEC of 110·00 lakh.

The programme for development of temporary urban settlements is in reality the low-cost sites and services schemes that are to be implemented with the primary objective of relocating the urban squatters in and around the metropolitan cities. Physical work on the selected sites must be preceded by organisational and technical feasibility studies for which technical assistance from UNDP is likely to be available.

The key works that are envisaged under this programme are tentatively identified as under:

(i) Acquisition and development of land in sizeable blocks.

(ii) Laying of main services network along the periphery of these residential blocks.

(iii) Demarcation of 80 sq. yd. size plots within the blocks for settlement by the squatter families.

(iv) Building of some 'core' houses.

(v) Essential community facilities such as schools, health centres, markets, etc.

The total allocation on this account is Taka 1000·00 lakh of which the FEC is Taka 100·00 lakh (Table XII-1). The sub-sectoral allocation for on-going and new housing schemes stands at Taka 11156·53 lakh with a FEC of Taka 1823·96 lakh.

C. *Government Offices and Institutional Buildings.*

The major on-going schemes being executed by the Buildings Directorate and the B. P. W. D. under this programme are:

(*i*) National Assembly Building Complex.

(*ii*) National Secretariat Complex.

(*iii*) Development of Sher-e-Bangla Nagar.

(*iv*) Construction of District and Subdivisional HQs.

(*v*) Government Office Buildings in the Metropolitan cities as well as in the outlying areas.

(*vi*) Martyrs' memorial at Savar.

(*vii*) Development of Suhrawardy Uddyan, Ramna Park, etc.

The total allocation for the on-going schemes is Taka 2703·38 lakh which includes a FEC of Taka 789·92 lakh.

The over-riding consideration for austerity precludes launching of any sizable programme of new offices and institutional buildings. Only a few new schemes have found place in the Plan of which the major one is acquisition of land for future expansion of Sher-e-Bangla Nagar. The other schemes are construction of a mausoleum over the graves of National leaders; miscellaneous office, storage and godown spaces essentially needed for implementation of the Plan programmes. An allocation of Taka 893·98 lakh of which the FEC of Taka 96·34 lakh has been made in the Plan for these purposes.

D. *Community Services and Utilities*

1. Public Health Engineering.

Under the rural water supply programme there are three on-going schemes which, after completion, will raise the existing stock of drinking water tubewells to a total of 2,85,000 shallow tubewells and 1,200 deep tubewells. The major inputs for sinking 1,60,000 tubewells are being provided by the UNICEF as an outright grant under the reconstruction programme. The deep tube-wells in the coastal areas are also financed by the UNICEF as part of the 1970 cylone Reconstruction Programme. A total allocation of Taka 711·80 lakh with FEC of Taka 343·00 lakh has been made for these projects (Table XII-1).

Under the on-going urban water supply programme provision is there for water supply systems for Khulna and Rajshahi and 21 other municipalities. The total allocation of Taka 371·89 lakh with a FEC of Taka 139·26 lakh (Table XII-1) accounts for the above schemes and some overhead expenditures such as consulting services etc. The total allocation for the on-going schemes of DPHE amounts to Taka 1083·69 lakh which includes a FEC of Taka 482·26 lakh (Table XII-1).

Under the rural water supply programme a major effort has been made to ensure safe drinking water supply to the rural inhabitants who constituted the overwhelming majority of our population. In addition, for the first time elementary rural sanitation in the form of supply of water-sealed slabs is being introduced on a massive scale to give such

coverage to as much as a quarter of our rural population. The three major schemes of water supply envisage sinking of 1,54,000 shallow tubewells and 21,900 deep tubewells during the next five years. The cost of these tubewells are to be shared in accordance with the following principles :

- In the case of shallow tubewells the cost of manufactured materials and technical supervision is to be borne by the Public Sector and the local costs of tools and equipments for sinking, local materials and hand tools, skilled and unskilled labours and other incidental expenditures will be borne by the beneficiaries/ Local Government.

- In the case of deep tubewells, the total cost will be borne by the Government excepting for the cost of local materials, hand tools, unskilled labour and accommodation and shelter which will be borne by the beneficiaries/Local Government. The same principle will apply for maintenance of these tubewells where the Government will supply spare parts for maintenance of these tubewells and supervision and the cost, labour, etc., will be the responsibilities of the beneficiaries/Local Government.

The total public sector investment for the new rural water supply and sanitation programmes amounts to Taka 3677·13 lakh which includes a FEC of Taka 1118·17 lakh.

Under the new programme for Urban Water Supply the following major projects find place in the Plan:

(*i*) Augmentation of the Water Supply Capacity in 7 important towns by way of extending the networks and improvement of water sources.

(*ii*) Installation of water supply systems in 38 urban centrs which includes all the district and subdivisional headquarters.

(*iii*) Establishment of Public Health Engineering Institute and PHE Laboratories.

(*iv*) Water pollution control activities.

With the completion of this programme almost all the urban centres of significance will be provided with the nucleus of a modern water supply system which in successive plan periods could be expanded into comprehensive systems for serving the needs of the total urban population in these centres. An allocation of Taka 1153·42 lakh with a FEC of Taka 424·40 lakh has been provided in the plan for this purpose. The total allocation for new programmes of DPHE amounts to Taka 4830·55 lakh which has a FEC of Taka 1542·57 lakh.

2. Dacca WASA

Revised Dacca Water Supply and Sewerage project is the only on-going schemes of Dacca WASA. This project is being implemented with credits from the IDA for the import of materials, equipments as well as for providing consulting services. Out of the estimated cost of Taka 3030·00 lakh (FEC 696·5 lakh), an amount of Taka 1603·6 lakh (FEC Taka 398·79) lakh has already been spent on the project. The rest of the amount needed for completion of the project has been provided in full which amounts to Taka 1426·40 lakh and has a FEC of Taka 259·20 lakh.

Among the new schemes of the Dacca Water Supply and Sewerage Authority that are included in the Plan, the following are the major ones;

(*i*) Improvement of distribution system in Dacca City and extension of the system to Sher-e-Bangla Nagar and old Airport areas.

(*ii*) Improvement of sewerage system in Dacca City and extension of the system to Sher-e-Bangla Nagar and adjacent areas.

(*iii*) Extension of water supply and sewerage system to Mirpur Areas.

These new schemes seek to supply water as well as to extend sewerage network into those areas which have already become highly urbanised but are outside the territorial scope of the on-going IDA financed scheme. Even after implementation of those schemes there will remain many other areas within the city which suffer from lack of modern water supply system. Again, the rate at which the city is growing, inescapably points to the need of a much bigger programme for development of the water supply system in the coming years. The total demand for water would be of such a magnitude that indefinite reliance on ground water sources could prove unworkable. Because of this, alternative surface water sources must be developed. During this Plan Period provision has been made for feasibility studies, planning, engineering designs, etc., in connection with construction of a surface water treatment Plant at Dacca.

The total allocation for the new schemes of Dacca WASA is Taka 844·30 lakh which has a foreign exchange component of Taka 336·30 lakh (Table XII-1).

3. Chittagong WASA

Chittagong Revised Water Supply Scheme is the Only on-going scheme of Chittagong WASA. As in the case of the on-going Dacca WASA project, this is a IDA credit financed scheme. The scheme envisages installation of a water supply network for the port city along with development of water sources including construction of a surface water treatment plant. Out of the estimated cost of Taka 1895·89 lakh (FEC Taka 588·54 lakh an amount of Taka 775·39 lakh (FEC Taka 176·72 lakh) has already been spent on the project. The rest of the amount will be utilised for completion of the supply network construction of elevated reservoirs and a surface water treatment plant at Mohra on the river Halda. The total estimated cost of the remaining works is Taka 1120·50 lakh (FEC Taka 369·19 lakh which has been fully provided for in the Plan.

Only two new schemes are to be taken up by Chittagong WASA during the Plan period. These are :

(i) Chittagong Water Supply (II Phase).

(*ii*) Chittagong Sewerage Scheme.

The city of Chittagong has far outgrown its original size for which the on-going Water Supply Scheme is under implementation. New industrial areas and urbanised zones have sprung up along the major highways necessitating extension of the existing networks as well as installation of new capacities. The Chittagong Water Supply Scheme (2nd Phase) envisages extension of the water supply to these areas and more intensive coverage within the city limits.

There is no sewerage system in Chittagong. A city of this size can hardly function without a modern sewerage system. Although the necessity for such a system is unquestionable but because of resources constraints, this cannot be taken up during this Plan period. However, preliminary works on feasibility surveys, engineering designs, etc., has been programmed so that from the beginning of the next plan actual work can commence. An allocation of Taka 500 lakh has been (Table XII-1) provided for these two new schemes during this Plan period.

4. Fire Services

There are four on-going schemes under implementation by the Directorate of Fire Services. These schemes relate to construction of a National Headquarters organisation build up, improvement of fire fighting capabilities and extension of fire protection coverage to 44 urban areas and important business centres. An allocation of Taka 268·30 lakh has been made for achieving the above objectives.

There are five new schemes for the development and extension of Fire Services included in the Plan. The first one of these schemes relates to establishment of a Fire Station at Joypurhat which is fast becoming an important industrial centre and has already started functioning as a subdivisional headquarters. The second scheme provides for a land and river fire station at Patuakhali.

Establishment of 44 new Fire Stations in important urban and business centres and establishment of a Reserve Depot of fire equipments and appliances are the two major new schemes which together account for 80% of the total allocation for new schemes. Provision has also been made for construction of static tanks and acquisition of existing tanks in the urban areas to ensure supply of water at times of emergency. A total allocation of Taka 879·30 lakh (FEC Taka 469·07 lakh) (Table XII-1) has been made in the Plan for the above purposes.

E. *Local Bodies*

1. Dacca Improvement Trust

There are 10 on-going schemes of Dacca Improvement Trust included in the First Five Year Plan. Of these 3 schemes relate to road construction in the metropolitan region which accounts for 40 per cent of the total allocation for the on-going schemes. The other schemes relate to commercial and industrial land development and construction and improvement of markets. The major road building projects are:

(i) Construction of road over Dholai Khal.

(ii) Widening and improvement of 12 major roads in Dacca and Narayanganj.

(iii) Arterial North-South Road.

Construction of these roads is a part of the responsibility of DIT that has been assigned to it in connection with the implementation of the Master Plan.

The other schemes are mostly concerned with commercial and industrial development. Of the 7 schemes there are two schemes for market improvement and construction and the rest are for commercial and industrial land development. An allocation of Tk. 545·00 lakh (foreign exchange Tk. 96·33 lakh) has been made in the Plan for these purposes.

Only four closely inter-related schemes are to be taken up by the Dacca Improvement Trust during the Plan period. These are:

(i) North-South Road from existing Railway Track upto river Buriganga.

(ii) Development of Buckland Bund (Phase 1).

(iii) Construction of road from Shambazar to Postagola.

(iv) Development of foreshore land along river Buriganga.

All these projects are located in the old parts of Dacca city. The schemes primarily envisage establishment of an efficient linkage between the old and new city and development of the River Front at Sadarghat with a view to develop and reorganise the principal supply point of the city for optimum functional efficiency. The other objectives are establishment of a road linkage between the developed Buckland Bund and Postogola and development of foreshore land as river side recreation space where the Tourism project of a Boat club is likely to be located. The total allocation for the new schemes of DIT amounts to Tk. 636·40 lakh (foreign exchange Tk. 81·99 lakh Table XII-1) for the First Plan period.

2. Chittagong Development Authority

There are twenty on-going schemes of Chittagong Development Authority included in the First Five Year Plan. Out of these 8 schemes relate to Master Plan road constructions and accounts for 42 per cent of the total allocation for the on-going schemes. The other schemes relate to commercial and industrial land development and market construction. All the road projects are in fairly advanced stages of construction. With the completion of these road schemes the acute traffic problem of the city will be eased. The other schemes are related to development of industrial estates for heavy, light and noxious industries in such locations as Kalurghat, Fouzdarhat, Sholoshahar, etc. The rest of the schemes are concerned with commercial land development and market constructions at different locations within the city.

The total allocation for the on-going schemes of Chittagong Development Authority is Taka 470·05 lakh which has a foreign exchange component of Taka 65·61 lakh.

The new schemes of the Chittagong Development Authority relate to construction and improvement of Master Plan Road and other city roads. The schemes are—

(i) Link Road from Patengabazar to Airport.

(ii) Construction of other major roads around the city and improvement of existing roads.

The link road project is in fact extension of the on-giong Saltgolla-Patengabazar road. Completion of this new road will provide the essential alternative route from the city to the Airport. Implementation of this project will also provide easy connection with the large industrial units that are being established in the Patenga area and will facilitate development of the seashore areas for industrial and recreation purposes. The second scheme envisages construction of a few other Master Plan roads within the city region.

The city, for its balanced development, needs to be connected with the left bank by a permanent bridge over the river Karnafully. The link that was established for a very brief period through the floating bridge, clearly established the viability and need for such a link. Although due to resources constraint, it is not possible to take up construction of the bridge in this Plan period, the need for this is nevertheless recognised. An allocation of Taka 50·000 lakh (foreign exchange currency 30·00 lakh) has, therefore, been provided in the First Plan for the feasibility studies, planning and structural design during the Plan period so that construction works can be taken up right from the beginning of the Second Plan period.

The total allocation of Taka 501·90 lakh (foreign exchange Taka 111·00 lakh) has been made (Table XII-1) in the First Plan for the new schemes of Chittagong Development Authority.

3. Khulna Development Authority

Thirteen on-going schemes of Khulna Development Authority find place in the Plan. Out of these, six schemes relate to Master Plan road constructions and account for almost 60 per cent of the total allocation for the on-going schemes.

Other schemes relate to development of industrial and commercial areas as well as construction of markets. The major road construction projects that have been provided for are—

(i) Outer By-pass Road.

(ii) Majgunni Main Road.

(iii) Daulatpur Outer By-pass Road.

(iv) Boyra Main Road.

Among the schemes for industrial and commercial development the construction of a market at Daulatpur, commercial area around Jessore road and Daulatpur and establishment of of an industrial area are of major importance.

The total allocation for the on-going schemes of Khulna Development Authority is Taka 318·02 lakh with a foreign exchange of Taka 32·45 lakh.

The new development programmes of KDA relate primarily to construction of major Master Plan roads in Khulna. The road schemes account for 65 per cent of the total allocation for the new schemes.

In addition to the road construction programme, KDA will implement a scheme for construction of hawkers markets in different locations of the city. This is needed to relocate the squatter shopkeepers to organized market places and to have the roadside lands vacated for further development purposes.

The total allocation for new schemes to be implemented by KDA is Taka 150·00 lakh which has a foreign exchange of Taka 15·50 lakh (Table XII-1).

F. *New District Headquarters*

The Government's policies of reorganization of the present 19 districts into 58 new districts by way of converting the existing Sub-divisions into new districts, is likely to generate additional needs for physical infra-structure facilities for Administration in the new district headquarters. Depending on the reorganization and territorial redistribution, the necessity of creation of a few more entirely new district headquarters may also arise. In addition, some of the existing subdivisional headquarters, if converted into new district headquarters, may need some additional district level facilities.

For meeting the minimum needs arising out of these eventualities, a block allocation of Taka 1000·00 lakh with a foreign exchange of Taka 100·00 lakh has been kept in the First Plan for the above purposes (Table XII-1).

12.6 TOURISM

A. *Role of Tourism*

In the modern world tourism has assumed the dimensions of the largest single foreign exchange earner in the world trade. The Global tourist earnings jumped from 5 billion in 1968 to 17 billion in 1970 which accounted for 6 per cent of the total value of world trade.

The introduction of speedy and cheap air-transport systems, mass use of automobiles and development of other means of transport, are primarily responsible for the huge increase in tourist trade. This added growing affluence and increasing leisure available to the population of the developed countries caused the spectacular growth rate experienced in the sixties which still continues unabated.

Tourism today is not confined to a few countries of traditional tourist interest; more and more tourists are now avoiding the overcrowded beaten track and heading for new areas. This tourist behaviour was identified and exploited by many countries by developing their own tourism infra-structures. The economy of Bangladesh can also derive benefit in respect of considerable foreign exchange earning through the development of necessary infra-structures.

In the past studies have been made to determine the tourism potentials of the then East Pakistan. The Master Plan for the development of tourism and the report of the Battale Institute of Germany confirmed that development of Tourism was an economically profitable proposition for earstwhile East Pakistan. The emergence of the sovereign state of Bangladesh will have a much more favourable impact on the Tourism potential established by earlier studies.

The cost benefit analysis undertaken by some of the countries of South-East Asia show that the ratio stands at 1 : 5·8. The investment multiplier co-efficient of tourism in former Pakistan (1961) was estimated to be 3·3 compared to the national average of 2·9. In terms of 'value added' also, tourism compares favourably with many other sectors. For instance, gross added value from the tourism sector was estimated at 70 per cent of total production. Marginal value added of per rupee investment in former Pakistan during 1965—70 was 4·84 in tourism sector compared to 1·96 in the manufacturing sector. Moreover, the marginal value added generated by each full time worker in the tourist industry was estimated to be increasing per year @ 5·5 per cent whereas the rate was 1·7 per cent in Agriculture, 3 per cent in consumer goods industries, 4.2 per cent in construction industry and 3 per cent for the national economy as a whole. This implies that employment created in the tourist sector contributed to the increase in GNP more rapidly than employment created in many sectors of the country.

According to the study by M/S. SEMA, an economic Consultant Firm of Paris, Bangladesh will benefit in the following ways by developing her tourist industry:

(i) Balance of payments will improve through tourism in larger measure considering the investment-contribution rates.

(ii) The tax revenues will be several times higher than the investments.

A significant benefit in the post-liberation period will be the potential for developing the Chittagong Hill Tracts where the main emphasis will be placed for the tourism sector. This area which was sadly neglected under colonial rule has tremendous promise for tourism. Expansion of tourism will provide part of vital programme for generating income and employment for the inhabitants of this region.

B. *Review*

According to the IUOTO (International Union of Official Trade Organisation), a body affiliated to the United Nations, the high points that attract tourism are:

(i) Beaches

(ii) Scenic beauty

(iii) Tribal life

(iv) Archæological remains

(v) Wild life

(vi) Entertainment including souvenirs, shopping and night life.

(vii) Religion

(viii) Mountains

(ix) Health

From the above it can be clearly seen that Bangladesh is endowed with most of the natural motivational factors for the growth of tourism. The attractions that are inadequate or non-existent in Bangladesh are, by and large, man-made and can be created with determination and effort at various levels of national life.

This country is already well known in the world because during the liberation war, Bangladesh received an unprecedented attention of the international press. This has created an enormous world interest in Bangladesh which will greatly help the tourism promotional campaigns in the international market.

The emergence of Bangladesh as a sovereign state has automatically increased the tourism potential of the country manifold. The foreign embassies, the various international organisations and commercial organisation that are already established and continue to grow in number will also make a great contribution to the total tourist traffic.

In addition, a large number of business tourists arrive everyday for short visits. In the absence of basic facilities such as accommodation, transportation and recreation the full benefit of this fraction of tourist traffic cannot be derived. Most of the people who are stationed here

tend to spend their free time in nearby countries where these facilities are offered to them. The business tourists, on the other hand, try to shorten their stay as much as possible for the same reason.

With adequate care and planning it will be possible to prolong the stay of these visitors which will provide a valuable opportunity to diversify and enhance foreign exchange earnings. Depending on our ability to provide adequate facilities, we will be able to attract a large number of foreign visitors from the international tourist flow from UK, USA, Germany, Canada, Australia, East and West European countries, Middle East, Africa and South East Asian regions. That the growth potentials of tourism in this country is no fantasy is proved by the rate of growth of tourism in the South-East Asian countries where Bangladesh is located; while tourist traffic in the European countries grown at the rate of 9 per cent per annum, the tourist traffic in the South-East Asian region grew by 14 per cent per annum.

It is estimated that by 1978 approximately 8,12,800 visitors will come to Bangladesh and thereby create demand for a total of 20,32,000 Hotel nights. If we assume that on an average every tourist will spend Taka 100·00 per night then the total projected tourist spendings by 1978 will be Taka 20 crores.

Achievement of this target will require careful planning, sufficient allocation of resources and optimum utilization of the allocated fund in accordance with a carefully worked out strategy.

C. *Strategy*

Full development of the tourist potential of Bangladesh would require investments of a very high magnitude. Tourism being still in a nascent stage of development in the country and the necessary initial investments being comparatively higher, private sector investments in the tourist trade will only be marginal during the First Five-Year Plan. On the other hand the competitive demand for the Public Sector resources precludes the possibility of mobilisation of sufficient resources for the full development of the tourist trade in this Plan period. The investments will, therefore, have to be of a highly selective nature for ensuring optimum use of the available resources.

The main efforts are required to be directed towards the optimum development of acceptable tourist accommodations and tourist transports the two basic infra-structural components of the tourist trade. Acceptable standards of accommodation are to be made available in the three cities of Dacca, Chittagong and Khulna as well as in the tourist resorts.

The main development activities should be concentrated in the three touristically important areas of the country which are already attracting international tourism. These areas are the Cox's Bazar and Off-shore Islands Complex, the Kaptai-Rangmati Lake Region and the Khulna-Sundarbans Region.

Recreational facilities need also be provided in and around the metropolitan cities and in the areas likely to be frequented by the tourists. In keeping with our natural facilities, the main emphasis should be in the fields of water sports, water borne transportation and recreational arrangements including cultural shows, night life, etc.

Wild life sanctuaries and National Parks need also to be created to cater for international and domestic tourist interests. Possibilities of wild life observation and seasonal licensed shooting in selective areas will greatly enhance the interest of special groups of international tourists. This, however, will have to be taken up by the Ministry of Forest and Fisheries.

Development of domestic tourism is equally important as this constitutes a basic infra-structure for international tourism. Domestic tourism is doubly important in the sense that this sustains the tourist trade during the slack seasons of international tourism. Resource constraints compels diversion of resources to more urgent domestic needs so that domestic tourism must await subsequent plan periods for fuller development. For First Plan, only limited facilities in the form of accommodation in youth hostels, motels, cottages, camping sites and equipments and recreation will, therefore, be provided in the touristically important areas of the country.

Basically, however, the First Five-Year Plan period will be a period for making a modest start in development of the organisational infra-structure which will eventually lead to full-scale development of the tourist industry in the subsequent Plan periods. This implies that maximum effort should be made in the fields of market research, tourism promotion, training of necessary man-power research and preparation of feasibility studies and Master Plans for development of the different regions.

Some of the infra-structure for tourism such as communications, development of National Parks, services and utilities are the responsibilities of different Ministries. Successful implementation of tourism development programmes will necessitate inter-ministrial coordination. This may best be achieved by the Planning Commission through dovetailing the time schedule of the programmes of the different Ministries.

D. *Policies and Institutions*

International investments in tourism development is to be encouraged during this plan period especially in view of our limitation of resources as well as lack of experience in organising and managing related services and facilities. A favourable international investment climate needs to be created through policies of concessional tax rebates and liberal terms for repatriation of profits, etc.

The rigorous entry and exit formalities that are being followed now need to be relaxed in case of international tourists. This liberalisation may be effected either through bilateral agreements with the countries of tourist origin or as a blanket policy adopted unilaterally.

In matters of promotion of international tourist flow as well as in sharing in the growing tourist trade in the region, inter-regional co-operation agreements should be reached with neighbouring countries.

Investment in the tourism industry is almost a frontier activity for our private entrepreneurs. Special promotional policies are, therefore, needed to induce private sector involvement into this highly dynamic sector. These may be in the form of technical advice, extension services, tax rebates and exemption and liberal licencing policies for import of capital goods for the industry.

Public sector investment programmes in tourism should be so oriented that the cost of these facilities remain within the reach of the average tourists.

The policy for utilisation of the recreational facilities such as water transport and water sports shall be to reserve a major portion of these facilities exclusively for the international tourists during the tourist season.

In many countries a separate Ministry of Tourism have been created in order to formulate policies and execute programmes related to the industry. Eventually, in Bangladesh creation of such a Ministry will be necessary. However, the present organisation (Bangladesh Parjatan Corporation) should be so organised and developed that in course of time it can be elevated into a full-fledged Ministry.

There is an absolute lack of trained manpower for promotion, management and operation of tourist services and facilities in the country. An institute for Tourism should be immediately established initially with technical assistance from international sources.

Steps are to be taken to train up Bangladesh Parjatan Shangstha personnel in related fields abroad so that in a few years time the foreign technical assistance can be done away with.

E. Tourism

The programme envisages the construction of the following different categories to cater for the varying accommodation needs of the international as well as internal tourists:

Serial No.	Types of accommodation.	Dacca.	Cox's Bazar.	Kaptai/ Rangamati.	Khulna/ Sundarban.	Rajshahi/ North Bengal.	Others.
1	5-Star Hotels	150 rooms	100 rooms	..	..	..	
2	3-Star Hotels	100 rooms	..	..	..	..	..
3	Motels	..	100 rooms	25 rooms	..	75 rooms	50 rooms.
4	2-Rooms Cottages		20 Nos.	10 Nos.	3 Nos.	..	..
5	Holiday Houses for youth tourism. ..		100 beds	100 beds	..	25 beds	25 beds.
6	Hostel type accommodation ..		..	100 beds	..	..	..

The total investment target for creation of all these facilities has been set at Taka 1030·00 lakh of which the foreign exchange component is Taka 308·75 lakh (Table XII-1).

A fleet of 111 cars, 13 air conditioned coaches, 10 jeeps, 34 microbuses, one paddle-steamer, 2 launches and 22 sea-cruisers will be procured during the plan period.

The cars thus acquired will be utilised to organise a rent-a-car facility, in different locations depending on the estimated tourist inflow and expected demand for these facilities. The air conditioned coaches, microbuses and the jeeps are to be utilized for guided tours, excursions, hunting trips, etc. The paddle steamer will ply between Dacca and Khulna/Sundarbans regions once every week following a picturesque route and shall have internationally acceptable standards of accommodation and cuisine offered to the international as well as domestic tourist in the form of a package tour. The launches and river cruisers will cater to the other identified travel needs of the tourists.

The distribution of these facilities in different locations will be as under:

Serial No.	Types of facilities.	Locations. Dacca.	Cox's Bazar/ Chittagong.	Kaptai/ Rangamati.	Khulna/ Sundarban.	Rajshahi/ North Bengal.	Others.
		Nos.	Nos.	Nos.	Nos.	Nos.	
1	Rent-a-Car	50	20	15	16	18	
2	Air Conditioned Coaches ..	4	5	..	2	2	
3	Micro-buses	12	12	..	4	2	
4	Jeep	..	5	5	..	..	
5	Paddle-Steamer	1	..	..	..	..	
6	Launches	2	..	..	..	..	
7	River-Cruisers	8	..	..	..	..	

The investment target for this sector is Taka 300·00 lakh with a foreign exchange component of Taka 180·00 lakh.

Recreational facilities shall be limited to 2 boat clubs, one Boatel, 35 speed boats, 60 sail boats, 15 canoes, 15 rowing boats, 20 specially designed sampans, 20 water scooters, 10 house boats and mini-golf courses. The distribution of these facilities will be as under:

Serial No.	Types of facilities.	Locations. Dacca.	Cox's Bazar/ Chittagong.	Kaptai/ Rangamati.	Khulna/ Sundarban.	Rajshahi/ North Bengal.	Others.
		Nos.	Nos.	Nos.	Nos.		
1	Boat-clubs	1	..	..	1	..	..
2	Boatel	..	..	..	1	..	..
3	Speed Boats	10	..	20	5	..	..
4	Sail Boats	20	20	20	..	..	..
5	Canoes	5	..	10	..	..	..
6	Rowing Boats	5	..	10	..	..	..
7	Sampan	..	..	20	..	..	..
8	Water Scooter	10	..	10	..	..	..
9	House Boats	..	..	10	..	..	.
10	Mini-golf course ..	—	1	1		..	..

The total investment envisaged for the above Taka 180·00 lakh with a foreign exchange component of Taka 50·00 lakh.

Special projects in the tourism sector include development of Sitakund as a health Spa, floating restaurant at Kaptai, development of Kaptai lake islands as Camping and picnic spots, 5 way-side restaurants at conveniently located places along the major Highways, duty

free shops at International Airports and establishment of travel agencies at Dacca, Chittagong, Khulna and Sylhet. An allocation of Taka 200·00 lakh with a foreign exchange component of Taka 62·00 lakh has been provided for this programme.

A publicity and promotion campaign involving publication and distribution of tourist literature, feature films, establishment of offices in foreign countries, promotional tours by travel-trade personnel, photography, advertisement, package tours, international co-ordinations, etc., is to be launched as an essential part of the overhead facilities that have been programmed for. An allocation of Taka 145·00 lakh with a FEC of Taka 65·00 lakh has been made in the first five year plan.

Establishment of a Tourism Institute for specialised training in the field of hotel management, management of tourist recreation and transportations facilities, group tours handling and tourism development planning has been programmed for in the First Five Year Plan. Foreign technical assistance for this purpose and also for feasibility surveys are envisaged and provided for. The total allocation on account of the above amounts to Taka 65·00 lakh of which the FEC is Taka 31·00 lakh. Public sector allocation for the entire tourism sub-sector amounts to Taka 1920·00 lakh with a foreign exchange component of Taka 696·75 lakh.

TABLE XII-1

Abstract of First Five-Year Plan Allocations.

(Taka In lakh.)

Sl. No.	Agency/Sub-Sector.	Allocations.				Group/Agencywise Total.	
		On-going.		New.			
		Total.	F.E.C.	Total.	F.E.C.	Total.	F.E.C.
1	2	3	4	5	6	7	8
	A. Institutional Development.						
1	Physical Planning ..	140·00	85·00	210·00	60·00	350·00	145·00
2	Housing and Building Research.	150·00	50·00	..	..	150·00	50·00
3	Urban and Rural Housing Surveys.	..	..	20·00	2·00	20·00	2·00
	Sub-Total ..	290·00	135·00	230·00	62·00	520·00	197·00
	B. Housing.						
1	Development of Urban land and construction of low-cost public housing.	807·75	37·50	..	..	807·75	37·50
2	Low-income public Housing. Construction of 45,000 Apartments Shelters.	6500·00	1300·00	..	..	6500·00	1300·00
3	Additional land compensation	..	..	500·00	..	500·00	..
4	Pilot Scheme for introduction of pre-cast and pre-fabricated structures.	75·00	25·00	..	..	75·00	25·00
5	Extension of the Housing Directorate Buildings.	..	..	14·00	3·50	14·00	3·50

TABLE XII-1—*Concld.* (*Taka in lakh.*)

Sl. No.	Agency/Sub-Sector.	Allocations. On-going. Total.	On-going. F.E.C.	New. Total.	New. F.E.C.	Group/Agencywise Total. Total.	Group/Agencywise Total. F.E.C.
1	2	3	4	5	6	7	8
6	Public Servant's Housing:						
	a. Buildings Directorate	456·43	99·59	429·00	91·80	885·43	191·39
	b. B.P.W.D. ..	119·94	42·07	..	..	119·94	42·07
7	Pilot Projects for Model Villages and rural service centres.	..	..	1125·00	110·00	1125·00	110·00
8	Temporary Urban Settlements	..	..	1000·00	100·00	1000·00	100·00
9	Residential Land Development Schemes of the Urban Development Agencies:						
	a. Dacca Improvement Trust.	65·00	8·50	..	..	65·00	8·50
	b. Chittagong Development Authority.	22·00	..	..	..	22·00	..
	c. Khulna Development Authority.	42·41	6·00	..	..	42·41	6·00
	Sub-Total ..	8088·53	1518·66	3068·00	305·30	1,1156·53	1823·96
	C. Government Offices and Institutional Buildings						
1	Buildings Directorate ..	1110·55	237·02	225·75	54·43	1336·30	291·45
2	B.P.W.D. ..	1592·83	552·90	668·23	42·00	2261·06	594·90
	Sub-Total ..	2703·38	789·92	893·98	96·43	3597·36	886·35
	D. Community Services and Utilities						
1	Public Health Engineering:						
	a. Rural Water Supply and Sanitation.	711·80	343·00	3677·13	1118·17	4388·93	1461·17
	b. Urban Water Supply and Sanitation.	371·89	139·26	1153·42	424·40	1525·31	563·66
2	Dacca WASA	1426·40	259·20	844·30	336·30	2270·70	595·50
3	Chittagong WASA ..	1120·50	369·19	500·00	200·00	1620·50	569·19
4	Fire Services ..	268·30	88·15	611·00	380·92	879·30	469·07
	Sub-Total ..	3898·89	1198·80	6785·85	2459·79	1,0684·74	3658·59
	E. Urban Development Agencies.						
1	Dacca Improvement Trust ..	545·00	96·33	636·40	81·99	1181·40	178·32
2	Chittagong Development Authority.	470·05	65·61	501·90	111·00	971·95	176·61
3	Khulna Development Authority.	318·02	32·45	150·00	16·50	468·02	48·95
	Sub-Total ..	1333·07	194·39	1288·30	209·49	2621·37	403·88
	F. New District Headquarters	..	..	1000·00	200·00	1000·00	200·00
	G. Tourism	..	..	1920·00	696·75	1920·00	696·75
	Grand Total ..	1,6303·87	3836·77	1,5196·13	4029·76	3,1500·00	7866·53

CHAPTER XIII

COMMUNICATION

13.1 BANGLADESH TELEGRAPH AND TELEPHONE DEPARTMENT

13.1.1 Historical Development

In 1947 telecommunication services in Bangladesh consisted of only about a thousand telephones in the country. There were very few telegraph and telephone long distance circuits. Since then the growth of telecommunication services in the country had been unsatisfactory. All efforts by the local staff of the Department for the allocation of more funds for development were systematically being frustrated, and some projects could not be completed for years due to non availability of foreign exchange.

The projects were taken up haphazardly and piece-meal. The results were that in cases where projects were completed and made operative, the services were found to be unsatisfactory and inefficient. The growth of telephones in the past years had been very slow. Only about 50,000 telephones were installed within a span of 24 years, *i.e.*, a little more than 2,000 lines per year. The development of domestic and international long distance telegraph and telephone services were so limited that the telephone subscribers had to wait hours together for maturing a telephone call. A telegram often takes more than a day to reach its destination. Poor growth of this vital sector of the economy is mainly due to low investment made by the erstwhile Pakistan Government for the last 24 years. Only about Taka 50—60 crores (book value) were invested during the last 24 years which means a meagre amount of 2 crores per year. Due to this low rate of investment coupled with improper piece-meal planning of the schemes, the present telecommunication system in the country is not able to provide satisfactory services. An effort has to be made to remove the anomaly and provide the means for adequate services during the First Plan Period.

13.1.2 Present Position

The present position of Telecommunication facilities in the country can be summarised as under:

Number of Telephones	..	66,000
Number of Telephone Exchanges		
Automatic	..	22
Manual	..	215
Number of inland trunk circuits	..	286
Number of inland telegraph circuits	..	99
Number of overseas telegraph circuits	..	7
Number of overseas trunk circuits	..	10
Number of overseas telex circuits	..	6
Subscriber trunk dialling	..	9 places
Number of telegraph offices	..	568
Number of public call offices	..	700
Total staff of T & T Department	..	about 10,000

The Telegraph and Telephone Department, under their control, have two factories which have started production and which will take about a year or so to reach full production.

1. Telephone Industries Corporation:

(a) Value of assets	..	Tk. 3·70 crores.
(b) Capacity	..	Production of 20,000 lines exchange equipment and assembly of 30,000 telephone instruments.

2. Cable Industries of Bangladesh:

(a) Value of assets	..	Tk. 2·39 crores.
(b) Capacity	..	225,000 conductor kilometer of telephone cables per year.

Both these factories were established to enhance installation of telephone exchanges in the country and to save foreign exchange by local production.

As mentioned earlier, the services provided by the T&T Department are far from adequate. There are extreme congestions on the local telephone service. Recorded pending demand for telephones is about 20,000. In addition, there is a considerable hidden demand which will show up on provision of service. In Dacca and Chittagong alone, the number of new applicants for telephones are recorded at the rate of 1,270 per month. With the present number of 66,000 telephones in the country, the number per 1000 inhabitant comes to 0·9 which is one of the lowest in the world. For comparison, the number of telephones per 1000 inhabitants in India is about 2·1. Such inadequacy exists in all branches of telecommunication services in the country.

13.1.3 Objectives and Programmes

The basic object of the sector programmes is the availability of the means of communication and public services to the most desired locations and geographical areas which need the facilities. The telecommunication authorities have proposed to embark upon a modest programme during the next five years to improve the present situation. The important aspects of the programme consist of:

- Installation of 70,000 telephones, thereby increasing the number of telephones per 1000 inhabitants by the end of First Plan to 1·6. This includes opening of automatic telephone exchanges in about 50 more places and increasing the number of exchanges by about 400. The strategy will be to provide automatic exchanges in almost all the future District Headquarters, manual exchanges in most of the Thana Headquarters and public call offices in about a total of 500 Union Headquarters.

- Expansion of domestic long distance telephone and telegraph network. This means, high capacity microwave or coaxial cable network between major traffic centres, medium capacity Microwave or VHF network for connecting other important places and low capacity land line or single channel/3 channel VHF network up to Thana Headquarters and other business centres. Another aspect of this development is to provide reliable telecommunication facilities to the cyclone prone coastal areas in Bangladesh.

- Reliable overseas telephone, telegraph and telex network with UK, USSR, Japan, Hongkong, India, Burma, Nepal, Singapore, Switzerland, Germany, U.S.A. and other countries as per traffic requirement. This will materialise after installation and commissioning of the Satellite Earth Station in Chittagong as well as with the existing High Frequency equipment available in the country.

- Expansion and diversification of the existing two telecommunication factories particularly, the telephone factory so that most of the domestic demands of telephone exchanges and cables are produced within the country. The Telephone factory is at present manufacturing about 60 per cent of the various parts of exchange equipment and the rest 40 per cent being imported. At the end of the Plan period the factory will manufacture almost all the parts and components of the exchange as well as telephone instruments. For the Cable Factory after necessary balancing of the installation, efforts have to be made to look for export market since T & T alone will not be able to consume the full produce of the factory.

- Some of the major physical targets that will be achieved during the First Five-Year Plan are given below:

Number of telephones	..	70,000
Number of Telephone Exchange		
Automatic	..	50
Manual	..	400
Number of inland trunk circuits Number of Inland telegraph circuits	..	1,600 Approx.
Number of overseas telegraph circuit Number of overseas trunk circuit	..	25
Subscriber trunk dialling (and Nationwide dialling)	..	40 places
Number of telex subscribers	..	1,500
Number of telegraph offices	..	700
Number of Gentex	..	150
Number of public call offices	..	500
Number of employees	..	2,500

13.1.4 Organisation and Policy

A. *Organisation*

The Telegraph and Telephone Department is run on commercial lines, under the framework of Government rules and regulations. The Revenue and Capital budget of the Department are separate and no revenue is allowed to be reinvested. Moreover, though the Department is supposed to earn a substantial revenue in comparison to the investment, there is hardly any incentive or otherwise for good or bad performance by individuals, as in the case of industries, banks, etc. In most of the countries, Telecommunications (in some cases Post Office as well) are run under the management of an autonomous Board with wide powers and responsibilities. Even the World Bank loan, recently secured for the Department, envisages reorganisation of the Department. Successful implementation of the programme and provision of satisfactory public service will, therefore, depend to a great extent on early reorganisation.

It is, therefore, proposed that the T&T sector reorganise itself on the following principles:

- An autonomous T&T Board should be formed for the management of all T&T services, with wide administrative and financial authority.

- Separate Budget (Revenue and Development) should be prepared for T&T annually. With the approval of the Ministry this should be submitted for incorporation in the annual budget. Part of the revenue surplus be allowed to be reinvested for development work. The Agency should continue to pay a fixed return to Government on capital borrowing.

- Revenue budget should include as staff incentive both collective and individual as well as staff welfare and housing provisions.

B. *Policy issues*

Because of the size of the civil engineering works, it would be advantageous for the Agency to have its own Civil Engineering Cell. At present, all such works are carried out by the P.W.D. by charging 17½ per cent on the cost of work. Since PWD is the general construction agency of the Government, often this Department fails to complete the works according to programme. Same holds good for the Post Office Department. The T&T and P.O. Departments under the Ministry of PT&T have proposed a programme of more than 10 crores for the construction of various buildings, during the First Plan. With this volume of work the Ministry may like to have its own construction cell for timely implementation of its programmes, where the actual work will be carried out through Consulting Engineering Firms at a much lesser fees and greater pace in comparison to P.W.D.

13.1.5 Investment Programme

The Telegraph and Telephone Sector Development Programme envisages an investment of Taka 80·63 crores during the First Five-Year Plan with a foreign exchange component of Taka 31·73 crores. Besides these amounts a telephone factory and a cable factory, provided for in the industry plan, are an integral part of the programme for the development of the Communication Sector. These will cost a total of Taka 4·47 crores in the First Plan with a

foreign exchange component of Taka 1·44 crores. Table XIII-1 shows the summary of investment programme in the sector during the First Five-Year Plan. Table XIII-1·1 shows the investment of the sector included under Industry Plan.

TABLE XIII-1

Investment Programme: Bangladesh Telegraph and Telephone

(Taka in crore.)

Agency.	No. of Schemes.	Estimated Cost.		Estimated Expenditure up to June, 1973.		First Plan Allocation.		Carried over to Second Plan.	
		Total.	F. E.	Total.	F. E.	Total.	F. E.	Total.	F. E.
Bangladesh Telegraph and Telephone :									
On-going ..	23	66·34	27·84	9·06	2·56	53·94	23·18	3·34	2·10
New ..	21	60·45	20·96	..	..	25·59	7·98	34·86	12·98
Reconstruction ..	..	4·79	3·81	3·69	3·24	1·10	0·57	..	..
Total ..	44	131·58	52·61	12·75	5·80	80·63	31·73	38·20	15·08

TABLE XIII-1·1

Investment Programme: Telephone and Cable Industry (Included under Industry Plan.)

(Taka in crore.)

Agency.	No. of Schemes.	Estimated Cost.		Estimated Expenditure up to June, 1973.		First Plan Allocation.		Carried over to Second Plan.	
		Total.	F. E.	Total.	F. E.	Total.	F. E.	Total.	F. E.
Bangladesh Telegraph and Telephone :									
On-going ..	2	4·74	1·20	4·02	1·01	0·72	0·19	..	..
New ..	2	6·00	2·00	..	..	3·75	1·25	2·25	0·75
Total ..	4	10·74	3·20	4·02	1·01	4·47	1·44	2·25	0·75

13.2 POST OFFICE

13.2.1 Historical Development

The development of postal services in the country has been very limited. From 1947 till liberation, the number of post offices in Bangladesh rose from 2,932 to 6,592. The policy of the former British Government was apathetic towards the expansion of rural services because such services were to be run at a considerable loss. Later on the British Government and subsequently the erstwhile Pakistan Government in principle decided to open rural post offices incurring

losses. In India, however, this principle was executed as well. This is demonstrated by the fact that the increase in the number of post offices in rural areas from 1947 to 1968 in India was 500 per cent and in erstwhile Pakistan 200 per cent. The position of Bangladesh was however much worse.

13.2.2 Present Position

The present position in Bangladesh is that there are about 6,600 post offices in the country. This means about one post office for 12,000 people. Comparative figures for some other countries are:

Country.	Number of Post Office.	Population covered by one Post Office.
India	1,25,000	4,300
Pakistan	8,600	5,820
U. K.	25,000	2,000

The present value of assets of Post Office Department has been estimated to be about Tk. 8·00 crores with a staff of about 25,000 (including 11,000 part time employees).

13.2.3 Programme and Objective

The First Five-Year Development Programme envisages opening of about 3,725 new post offices—out of which 3,200 will be in the rural areas. This will mean one post office for 8,200 people by 1978. Simultaneously, it has been proposed to improve the delivery system and mail transportation system (partially) by the procurement of a suitable number of motor vehicles and scooters. Other items of importance is the mechanisation programme under which different types of machines are proposed to be obtained.

The objective of the Plan is to provide modern facilities in order to improve the efficiency as well as quality of various postal services. About 20 per cent of the existing Post Offices are proposed to be accommodated in departmental buildings. It has also been proposed to construct about 750 staff quarters for various categories of postal employees. The planned expansion of postal services in Bangladesh is expected to create between 12,000—15,000 jobs during the Plan period of which nearly 3,000 will be full time regular posts. It has been proposed to increase philatelic activities by opening new philatelic bureaus in important places. For providing adequate training to its staff, existing training centres have been proposed to be upgraded and new training centres opened. A number of staff welfare schemes are proposed to be materialised during the period. Total Investment Programme in this sector will be Taka 9·11 crores with a foreign exchange component of Taka 1·08 crores against the physical target of opening of 3,725 new post offices of which 3,200 will be in the rural areas. This programme will create additional job opportunity for 12,000 people during the Plan period. Breakdown of the investment in this sector during the First Five-Year Plan can be seen at Table XIII-2. On full implementation of the Plan, the revenue of the Department is expected to rise by Tk. 3·5 crores per annum. However, there will still be a net operating annual loss for the Department. This loss can be made up by increasing postal charges on items such as insurance, parcel, registration etc. and international postage, etc., which are not generally used by common people.

TABLE XIII-2

Investment Programme: Bangladesh Post Office. (*Taka in crore*)

Agency.	No. of Schemes.	Estimated Cost.		Estimated Expenditure up to June, 1973.		First Plan Allocation.		Carried over to Second Plan.	
		Total.	F. E.	Total.	F. E.	Total.	F. E.	Total.	F. E.
Bangladesh Post Office:									
On-going ..	11	1·22	..	0·68	..	0·54	..	..	..
New ..	16	16·83	1·22	..	..	8·47	1·08	8·36	0·14
Reconstruction ..	..	0·29	..	0·19	..	0·10	..	..	..
Total	27	18·34	1·22	0·87	..	9·11	1·08	8·36	0·14

13.2.4 Policy Issue

No major policy issue is involved in the implementation of the programme. The programme has been prepared in line with the broad objectives of the Government to provide adequate and efficient postal services for the people in general and for the industries, trade and commerce and the Government in particular. In implementing the programme for opening 3,200 Rural Post Offices, the Department will incur an anticipated maximum operating loss of approximately Taka 0·66 crores in five years. In this connection it may be necessary for the Government to allow an increase in the loss per post office per year from Taka 600 to Taka 1,000. Another important point for consideration will be the pace of construction work. A considerable amount has been provided for the construction of buildings. The Department has to formulate a clear policy in consultation with the Ministry of Works regarding setting up of an efficient mechanism for rapid completion of building works.

13.3 BANGLADESH TELEVISION

13.3.1 Historical Development

Television in this region came in the year 1964, with the commissioning of a Pilot Station in an improvised studio at the DIT building. Subsequently, two major projects were undertaken for the development of TV in this region:

(i) Dacca Television Bhavan at Rampura at an estimated cost of Tk. 4·7 crores for which equipment worth Tk. 1·02 crores was imported. Other work in this project includes two big studios and three small news booths, auditorium, studio for educational television, one film production unit and one staff training institute.

(ii) The second project consists of four Satellite Stations for rebroadcast. For this work, equipment costing Tk. 0·62 crores was imported earlier but a part of the consignment was damaged during the Liberation War.

13.3.2 Present Position

Work on the first phase of Rampura Television Bhavan with two big studios and three small studios are in progress. The programmes are now being transmitted from the Rampura TV transmitters which were commissioned in 1968. A microwave link exists between DIT studio and the Rampura transmitter. The Television authorities have the required number of management, technical and programming personnel available to cater for their immediate need. The present assets of the TV are of the order of Tk. 1·8 crores with 320 staff employed.

13.3.3 Programmes and Objectives

The programmes proposed by the Television Authorities for the First Five-Year Plan assures availability of TV facilities to rural areas. The objective is not only to generate programmes for entertainment but also produce educational, health and agricultural programme for the benefit of the rural population. There are three aspects of the schemes: Firstly, to radiate programmes in such a way that a major part of the area of the country is covered; Secondly, proper people oriented programmes are produced for the real benefit of the country; Thirdly, proper arrangement for the reception of the programme is to be made in the rural areas. By the end of the Plan period the following targets are expected to be achieved :

(i) About 8-10 hours of programmes per day.

(ii) 80 per cent of the population will be brought under TV coverage.

(iii) Infrastructure for the transmission of multichannel transmission.

13.3.4 Investment Programme

Total financial outlay in this sub-sector during the First Five-Year Plan will be Taka 4·56 crores with a foreign exchange component of Taka 2·89 crores. Details of this programme is exhibited at Table XIII-3. Major schemes that will be undertaken for implementation during the First Five-Year Plan are:

(i) Completion of Dacca Television Bhavan including one modern auditorium, studio for Educational TV, one film production unit and a Staff Training Institute.

(ii) In addition to the proposed 4 Satellite Stations for rebroadcast for which equipments are partially available, TV authorities have projected to start works of 5 more Satellite Stations within the Plan period.

TABLE XIII-3

Investment Programme: Bangladesh Television.

(Taka in crore.)

Agency.	No. of Schemes.	Estimated Cost.		Estimated Expenditure up to June, 1973.		First Plan Allocation.		Carried over to Second Plan.	
		Total.	F. E.	Total.	F. E.	Total.	F. E.	Total.	F. E.
Bangladesh Television:									
On-going	2	7·22	4·30	3·17	1·81	3·80	2·29	0·25	0·20
New	1	1·65	1·30	..	..	0·76	0·60	0·89	0·70
Total ..	3	8·87	5·60	3·17	1·81	4·56	2·89	1·14	0·90

13.3.5 Policy Issues

So far as Television is concerned implementation of the programmes will depend on some policy issues.

Firstly, it has to be decided as a matter of policy whether Television will be used extensively in the rural areas for educational, health and agricultural purposes. If the decision is in affirmative then details will have to be worked out regarding the production of such programmes in consultation with the relevant Ministries. This question of policy is already under the consideration of the Government and the Ministry of Information and Broadcasting are looking into the problem.

Secondly, development of mass TV implies mass distribution of TV sets down to the village level where transistorised TV has to be introduced. This will mean mass import/local production of TV sets. At present there is a ban on the import of TV sets, If the policy on TV is changed, it follows that both import and production policies should be changed.

13.4 RADIO BANGLADESH

13.4.1 Past Development and Present Situation

Radio is the most widely used mass communication medium. The socio-economic value of Radio is enormous since various development-oriented programmes on education, health and agriculture can be cheaply disseminated to the masses which will indirectly effect the economy of the country. Moreover, with a simple and cheap radio receiver, the programmes can be heard at almost any place thus making the services versatile and ensuring efficient and effective mass communication.

The major Broadcasting Station in Dacca was started before 1947. However, the development since then has been very slow and inadequate. The station had to be worked with minimum facilities. Five more Radio Stations at Chittagong, Rajshahi, Sylhet, Khulna and Rangpur were also installed before liberation mainly for relaying the broadcast from Dacca. Among these Rajshahi and Chittagong had independent broadcasting facilities as well, though ill equipped.

At present Radio Bangladesh has approximate assets of Tk. 2·5 crores and a staff strength of 1,300. These assets are a broadcasting house at Dacca, a low power transmitter at Mirpur and a high power transmitting station at Savar. There are 5 Radio Stations at Chittagong, Rajshahi, Sylhet, Khulna and Rangpur. Rajshahi and Chittagong have a 10 KW transmitter each with an independent broadcasting house. Rangpur has one 10 KW transmitter with two emergency studios. Similar facilities existed at Khulna but these were damaged beyond repair by the Pakistan Army. Khulna is now functioning only as a relaying station with an emergency 1 KW transmitter. One 5 KW old transmitter at Mirpur, installed in 1938, needs immediate replacement. A High Power Station, Savar, one 100 KW medium wave transmitter and two 100 KW short wave transmitters are working. Broadcasting studio facilities as well as relaying facilities are also very meagre. Work is in progress for the installation of a 1000 KW medium wave transmitter at Nayarhat, received from USSR.

With the completion of installation of the 1000 KW transmitter at Nayarhat, the whole of Bangladesh will be covered by a single channel Dacca medium wave programme and it will be possible to broadcast in the External Services in the medium wave band for the neighbouring countries.

13.4.2 Plan Programmes

A National Broadcasting House has been planned to be included in the First Plan. This will be a multistoried building and will contain 25 to 30 studios for home services, farm broadcast, educational broadcast, commercial broadcast, news and all external services to be started from the capital. Besides, this building will accommodate the office of the Director General.

Radio Bangladesh does not have facilities for external broadcast due to lack of high power transmitters and aerial system. This is an essential programme for an independent country and therefore provision has been made for four 250 KW short wave transmitter to be procured in

two phases. This will enable us to beam external broadcasts in 4 channels round the clock for various countries. High power short wave transmitters will override the problems of interference and jamming and will ensure reliability of service.

A single 100 KW medium wave transmitter for each at Chittagong, Khulna and Rajshahi has been included.

A 20 KW transmitter at Sylhet and replacement of the 5 KW transmitter at Dacca (channel B) are also programmed.

Full-fledged broadcasting houses for Khulna, Rangpur and Sylhet have been included in the Plan. Further, provision has been made for a training institute, communication equipment and mobile vans required to meet urgent demand of the stations.

13.4.3 Investment Programme

An investment of Taka 15·75 crores with a foreign exchange component of Taka 6·73 crores has been envisaged for the implementation of these programmes during the First Five-Year Plan. Table XIII-4 shows the detailed break-down of the investment programme in this sector.

TABLE XIII-4

Investment Programme: Radio Bangladesh.

(Taka in crore)

Agency.	No. of Schemes.	Estimated Cost.		Estimated Expenditure up to June, 1973.		First Plan Allocation.		Carried over to Second Plan.	
		Total.	F. E.	Total.	F. E.	Total.	F. E.	Total.	F. E.
Radio Bangladesh:									
On-going ..	13	15·51	6·91	1·98	0·43	9·76	4·51	3·77	1·97
New ..	14	16·23	5·30	..	..	5·48	2·17	10·75	3·13
Reconstruction ..	..	0·87	0·34	0·36	0·29	0·51	0·05	..	..
Total	27	32·61	12·55	2·34	0·72	15·75	6·73	14·52	5·10

13.5 METEOROLOGICAL DEPARTMENT

13.5.1 Present Position

The devastations caused to lives and properties by the tropical cyclones, tidal bores and Norwesters in Bangladesh in the past years are too well known to need recapitulation. The death toll of November 1970 cyclone alone was estimated to be about 10,00,000 in the coastal districts in addition to the damage to crop, cattle and other movable and immovable properties worth many crores of Taka. The Meteorological Department is responsible for issuing advance warnings of such calamities for the safety of lives and properties on land, air and sea. In addition, the

Meteorological Department is required to prepare and furnish climatological information about meteorological elements such as rain, wind, temperature, humidity, etc., which information is necessary for the planning, design and development of almost all types of projects. The importance of the proper functioning of this Department cannot be under-estimated since a timely warning can save many lives and perhaps properties and availability of necessary Meteorological data will ensure proper planning of projects.

As in the case of many other organisations, the Meteorological Department headquarters and most of the assets were not properly utilized for Bangladesh before liberation. Even though Bangladesh is subjected to frequent natural calamities and shortage of Meteorological data, little effort was made to organise and establish the department with the necessary equipment and installations. Studies of the problem were made by international experts after 1960 and necessary recommendations were made. But due importance was not then attached for obvious reasons and only a very small programme was taken in hand, which was quite inadequate.

At present, Meteorological Department has a modest organisation having its total assets of about Taka 0·6 crore, and a staff complement of 754 numbers. The main facilities consist of one Storm warning centre, two Radar Stations, 12 First Class Meteorological Observatories, 8 Pilot Balloon Observatories, 3 Rawinsonde Observatories, one Seismic Observatory and 4 Forecasting Centres along with some other installations.

These are extremely inadequate to meet the requirements in the country and therefore, should be enhanced quickly.

13.5.2 Plan Objectives

The facilities requested for in this Plan will allow the Meteorologists to issue more accurate and precise forecasts for cyclone warning, route forecast for National and International air services, Long Range and Short Range forecasts for the promotion of agriculture.

Elaborate rainfall data and climatological information of various meteorological elements will allow the Government to assess agricultural conditions pertaining to food production.

In addition to meeting the requirements of the country, the Meteorological Department will have to fulfil some international obligations as well. These include transmission of meteorological data to other countries, serving international airlines with meteorological information, reception and transmission of such information from other countries.

13.5.3 Financial and Physical Programme

An investment programme for the development of this sub-sector has been drawn up at a total cost of Taka 3·45 crores with a foreign exchange component of Taka 0·34 crore over

the Plan period. Details of this programme can be seen at Table XIII-5. Some of the major schemes that will be undertaken during this period are given below:

(i) Development in the Network of Synoptic Meteorological Observatories.

(ii) Improvement in the Network of Upper Air Observatories.

(iii) Improvement of Aviation Meteorology.

(iv) Improvement in the Telecommunication Service.

(v) Establishment of Training Institute.

First Plan schemes consist in setting up of :

(i) Opening of 39 surface Meteorological Observatories.

(ii) Opening of 10 Observatories on board the ships.

(iii) Rain-gauge station in 430 Thana.

(iv) Establishment of 2 Seismic Observatories.

(v) One Pilot Balloon Observatory.

(vi) Two Rawinsonde Observatories.

(vii) Two Weather Surveillance Radar.

(viii) Strengthening of Main Meteorological Office.

(ix) Procurement of Telecommunication Equipment.

TABLE XIII-5

Investment Programme: Meteorological Department.

(Taka in crore)

Agency.	No. of Schemes.	Estimated Cost.		Estimated Expenditure up to June, 1973.		First Plan Allocation.		Carried over to Second Plan.	
		Total.	F. E.	Total.	F. E.	Total.	F. E.	Total.	F. E.
Meteorological Department:									
On-going ..	20	1·96	0·26	0·70	0·18	1·26	0·08	..	..
New ..	9	2·19	0·26	..	..	2·19	0·26	..	..
Total	29	4·15	0·52	0·70	0·18	3·45	0·34	..	..

CHAPTER XIV

EDUCATION AND MANPOWER

14·1 EDUCATION

14·1·1 Historical Background

A. *Introduction*

The system of education prevalent in the subcontinent before 1947 was not geared to the needs of an independent nation or of a growing economy. Its purpose was primarily to produce a number of educated people who could assist the British colonial administration in the country. In fact, the small section of people who were educated under this system acquired a set of values which, on the one hand, alienated them from their own people, and on the other, developed in them a distaste for all forms of manual labour.

During the period 1947—55, the traditional system continued but with general deterioration resulting from mass scale exodus of qualified teachers. After 1955, attempts were made to rectify the situation by adoption of education expansion programmes. These programmes succeeded in raising the absolute numbers of educated people in different strata but failed to respond commensurately to the manpower requirements in various fields. The supply of trained manpower of some categories went up without being matched by that of other categories thus causing an imbalance between the demand for and supply of total trained manpower. The philosophy of education or its content was not appreciably changed to suit the requirements of a developing nation. Our educational system thus conspicuously failed to inculcate consciousness in the minds of the educated people of their obligations towards the less fortunate masses. The educated few in Bangladesh have remained oblivious of their debt to the society which has really borne the cost of their education.

As regards financing of education, there was a gradual increase of the amounts allocated to education in the public sector for development programmes of the erstwhile Government of Pakistan although private contributions to education were also substantial. But though Government expenditure on education went up in absolute terms, as a percentage of total allocation this remained more or less the same. This percentage varied between 5 and 6 in the successive five-year plans of Pakistan. The comparative neglect of the education sector failed to facilitate the development of requisite skills in the country. It also evoked serious discontent among the people. High priority to higher education rather than primary and teacher education led to educated unemployment, thus creating an imbalance in the education sector and generating considerable social tensions in the country.

B. *Primary Education*

In spite of the growing social demand for universal primary education, necessary steps to provide it were lacking. In fact, the percentage of illiteracy increased from 78·90 per cent to 82·39 per cent during 1951—61 even though enrolment in primary schools rose from 26 lakh to 60 lakh between 1947 and 1973. About 58 per cent (Table XIV-1) of the present primary age-group population are enrolled in schools. The apparent paradox of simultaneous increase in illiteracy and enrolment at primary level can be explained on the one hand, by the growth of school-going population as a result of the rapid growth of the country's population and on the other hand, by the high rate of drop-out of school-goers

specially girls before acquiring literacy. The number of primary schools declined from 29,633 in 1947-48 to 26,665 in 1960-61. During the sixties attempts were made to reverse this trend. The number of primary schools was 30,446 in 1972-73 (Table XIV-1). Since the mid-fifties efforts have been going on to reconstruct about 15,000 of the primary schools and to provide each of them with at least five teachers. The financial provision for instructional materials, text-books, qualified teachers and their training has been extremely inadequate all through.

C. *Secondary Education*

In the sphere of secondary education, however, a considerable expansion took place in terms of both number of schools and enrolment during the decade 1960—70. Most of the junior schools were upgraded into high schools, and new secondary schools having classes VI—X were established which brought the number of high schools to 4,172 in 1972. Simultaneously, however, the number of junior schools (*i.e.*, covering classes VI to VIII) declined from 2,175 to 1,811. The total student enrolment in the secondary stage also increased appreciably during the same period. In spite of this expansion in secondary education only 17 per cent (Table XIV-1) of the age-group 11—15 are now enrolled in the secondary schools of the country. Secondary education was inordinately tilted towards humanities in the past, although some innovations in curricula, mode and method of teaching were introduced along with bilateral and multilateral streams within the system to create facilities for teaching science and other diversified subjects.

At present, 770 secondary schools offer mainly two options: humanities and science, and 221 secondary schools offer multilateral options which include, besides humanities and science, industrial arts, commerce, agriculture and home economics.

D. *Teacher Education*

Teacher education has been a neglected sector in the past. Expansion of facilities for teacher training did not match the expansion of pupil enrolment. Opportunities to enter the teacher training institutions have also been inadequate in proportion to the rapid increase in the number of teachers although the absolute number of teacher training institutions have increased during the period. As a consequence, the number of untrained teachers has increased from 61,900 to 88,200 over the period 1947—72, resulting in the deterioration of the quality of instruction. In 1972, thirty-nine per cent of the primary teachers were untrained, and at the secondary level, the corresponding figure was seventy-two per cent.

Further, due to neglect of the teaching profession, the social image of teachers has been gradually eroded. It has now become extremely difficult to recruit young school leavers to the teaching profession. Young people do not feel sufficiently attracted to the profession due to the fact that income is low and social status is on the wane. Moreover, they do not relish the idea of living in the rural areas, where most of the schools are situated.

E. *College Education*

College education expanded mainly in response to popular demand and the bulk of the expansion occurred during the sixties. Enrolment rose from 0·18 lakh in 1950-51 to 3·28 lakh in 1972. The number of colleges increased from 59 to nearly 500 (Table XIV-1). The expansion in college education, however, has been more pronounced in the case of institutions known as intermediate colleges offering higher secondary certificate courses. Formerly only 21 of such institutions existed in the country. The establishment of a large number of intermediate colleges in the rural areas of the country has facilitated the Secondary School Certificate holders to continue academic activities which are of negligible value from the point of view of national manpower requirements. Most of these colleges are privately managed but recognised by the Government. These again are crammed for space and starved of facilities. During the sixties grants were made by the Government to these institutions primarily to meet their development needs and also to improve the quality of instruction.

F. *University Education*

University education has been elitist and formal. The number of general universities increased from one to four, while two universities of professional nature, one for agriculture and the other for engineering, were established. Physical development centred primarily round science and science-based fields and other related disciplines, strategically important to the economy. However, traditional disciplines also received attention. At present, all the universities, except Jahangirnagar and Chittagong, are capable of meeting both quantitatively and qualitatively the requirements of high level manpower envisaged under the Plan although point of concern will be the increasing cost of their maintenance. The universities have, over the years, succeeded in creating a basic infra-structure for research but this is yet to be utilised productively. Financial allocation to university education has been disproportionately high compared to the lower levels of education. Expenditures for construction of physical facilities at the universities were also rather exorbitant.

G. *Technical Education*

Since 1960, technical and engineering education has been receiving greater attention. The existing engineering college at Dacca was upgraded into a university, and two new engineering colleges were established at Chittagong and Rajshahi. Construction of one more college at Khulna is nearing completion. Enrolment in these institutions now stands at 3,000 compared to 125 in 1947.

Technical education at the diploma level was also encouraged. Twenty polytechnic institutions were established with an enrolment capacity of 10,900. All the polytechnic institutes are now functioning and annually turning out 2,800 diploma holders.

Certificate level institutions were established to produce skilled workers, but their development has not kept pace with that of the diploma and degree level institutes. It is natural to expect that along with industrialisation the need for skilled workers would go up. Corresponding facilities are, therefore, required to impart skills to the industrial workers. But the facilities which have been created in the country during the last few years are not being utilized. Of the 3,400 places available in the country for certificate level courses, 1,700 in 22 vocational training institutions and another 1,700 in 13 polytechnic institutions (evening courses), no more than 1,500 students are completing training each year.

H. *Scholarships*

An elaborate scholarship programme covering all levels exists at the moment. With increased enrolment anticipated during the Plan, a re-examination of the scholarship programme is required to improve its administration and effectiveness.

Foreign training of teachers and other high-level manpower has provided a large number of trained personnel to the economy within a short time. However, a significant percentage of such trained manpower either did not return to the country or migrated abroad soon after their return. While training abroad is absolutely necessary to meet critical shortage of high level manpower, suitable measures must be adopted to check the brain-drain.

I. *Arts and Culture*

In every nation, culture has an important role to play in defining national identity and in establishing a rightful place for the nation in the comity of nations. Unfortunately, this aspect was not given due importance in the past programmes and plans resulting in a gradual decline of cultural levels and degeneration of cultural and ethical values.

Publication of books and their distribution through libraries were not encouraged. No serious attempt was made to make people aware of the heritage of the country through the development of galleries or museums. Our own arts and music were played down, and deliberate attempts were made to spread an alien culture in these fields. Facilities for physical education and sports were almost absent.

J. *Literacy and Adult Education*

Literacy and adult education were also given very little attention. In order to mobilise the people for large scale development activities it is essential that the masses are made conscious of their role in the development of the country. This can only be achieved through a massive programme of functional literacy.

TABLE XIV-1

Development of Education in Bangladesh from 1950 – 1972

Level of Education (with age-group)	Year	Enrolment (In lakh)	Percentage increase/ decrease over the previous period	Age-group population (In lakh)	Percentage of age-group in schools	Institutions	Percentage increase/ decrease over the period
Primary (6—10)	1950-51	24·49	—	60·17	41	26,352	—
	1960-61	33·30	35·97	76·30	44	26,665	0·01
	1972-73	60·00	80·15	102·60	58	30,446	14·12
Secondary (11—15)	1950-51	5·14	—	46·10	11	3,507	—
	1960-61	5·33	3·55	59·90	9	3,140	(—)10·47
	1972-73	17·00	219·07	98·90	17	6,000	191·08
College—Intermediate (16-17)	1950-51	*0·13	—	18·40	0·69	23	—
	1960-61	0·37	185	22·20	1·67	21	(—)8·70
	1972-73	2·30	522	35·50	6·48	300	1328·57
College—Degree (18-19)	1950-51	0·05	—	14·80	0·34	**36	—
	1960-61	0·14	180	16·60	0·84	**60	66·67
	1972-73	0·98	600	34·31	2·86	200	233·33

14·1·2 Objectives and Strategies

A. *Introduction*

Socio-economic aspirations of a society can be realised only when the objectives and strategies in the education sector are made consistent with such aspirations. The following fundamental principles of State Policy have been incorporated in the Constitution of the People's Republic of Bangladesh:

> "The State shall adopt effective measures for the purpose of:
>
> —establishing a uniform mass-oriented and universal system of education and extending free and compulsory education to all children of such stage as may be determined by law;
>
> —relating education to the needs of society and producing properly trained and motivated citizens to serve these needs; and
>
> —removing illiteracy within such times as may be determined by law."

The Government have set up an Education Commission to examine the various problems of educational development of the country and also to prepare a comprehensive report on education reforms. The Commission will not only indicate the future structure of education and the curricula but also the manner in which education can be brought close

*Enrolment shown includes the number of students attending the intermediate section in the degree colleges.
**Includes intermediate section.

to the environment. Naturally, such an enormous task cannot be completed within a very short time. Government policy on education, however, can only be determined after the completion of the work of the Education Commission, and till now the Commission has only submitted an interim report to the government. While education must be responsive to social and economic needs, a socialist democracy like Bangladesh cannot allow creation of an elite class as in the past. Simultaneous attempts must, therefore, be made to change the values which a boy or a girl imbibes along with his or her training and education. In this context, the content of education assumes greater importance than the methods of education. The Education Commission will no doubt suggest measures for making our education system more efficient. They will also formulate proposals for making the 'content' consistent with the desired goals and values of the nation.

B. *Objectives*

The educational programmes of the First Five Year Plan has been framed within the spirit of the following objectives:

(i) Education must be responsive to the specific requirements of the nation. It must have relevance to future work and life, and must provide adequate preparation for productive employment.

(ii) The system should produce, whether through formal or non-formal education, a cadre of skilled manpower required for development needs of the country. It must no longer turn out scores of 'educated' men who remain mostly unemployed or unemployable.

(iii) All citizens should have an inherent right to a minimum level of education and be able to receive it at any age convenient to them. An 'open' educational system should, therefore, be developed which would widen the range of choices available to the learners and permit them to move both horizontally and vertically. All children must, however, be assured of basic formal education at least of the primary level.

(iv) Educational facilities of a basic minimum standard will be made available to all seats of learning regardless of whether they are located in the rural areas or in the cities, and whether they are managed by the government or private individuals.

(v) The educational system must do away with the strict compartmentalisation of primary, secondary and higher education and instead aim at reaching a 'spectrum of education' which would be open to all, through innovative measures. In other words, the educational system must be viewed as a totality and the goals of all the different layers must be one.

(vi) Education, broadly viewed, must be able to enrich the cultural attainments of the people.

While adopting a strategy for attaining the objectives outlined above, the following considerations will have to be taken into account.

First, how far will it be feasible to expect a complete breakaway from the existing educational system within a very short time even if such an overhaul were considered desirable? An abrupt breakaway, instead of facilitating the growth of educated and skilled manpower may, in fact bring about a disruption of the system thus discrediting the innovative measures. This, however, should not prevent us from adopting measures which are urgently necessary for the educational development of the country.

Second, the social demand for education is so great that a strict application of the cost-benefit analysis, cost-effectiveness or rate of return approach, cannot be made while determining the direction and magnitude of educational development in the country.

Third, so long as earnings of high-school and college educated youths are higher than those with only primary education and so long as the opportunities for acquiring skills outside formal schooling remain limited and social status of skilled workmen remains lower than that of college graduates, children of poor families or with limited academic promise, will continue to flock to colleges for higher education.

Fourth, in the past, comparatively large sums were contributed by philanthropists for educational development. In a socialist society where there is neither a landed aristocracy nor industrial magnets with huge funds at their disposal such contribution must necessarily be small. The well-to-do persons in the rural areas can at most be persuaded to donate land on which to erect school buildings or provide local building materials and some labour. The magnitude of such contributions cannot but be modest.

Fifth, it is difficult to draw up educational and training programme strictly on the basis of manpower projections with inadequate knowledge about the exact requirements of skilled manpower in the various sectors of the economy and the precise nature of technological transformation which will inevitably take place in a growing economy.

Once these limitations are overcome, it will be possible to hasten structural changes in the educational system.

C. *Strategies*

The following strategies will be adopted in the First Five Year Plan in pursuance of the aforesaid objectives :

(i) Efforts will be made to improve the quality of education by making an optimum use of the available facilities and increasing the number of trained teachers, particularly at the primary and secondary levels. Facilities such as teachers and teaching materials, will be increasingly channelised to these institutions so that better education and larger enrolment can be secured simultaneously. Larger enrolment will be made possible through double shifts in most cases.

(ii) Science education in both schools and colleges will be strengthened through the provision of well-equipped laboratories and more practical lessons.

(iii) Vocational and technical training at different levels will be given greater emphasis with provision for enlarged on-the-job training. These training facilities will help to take care of the school drop-outs.

(iv) The central laboratories and community workshops attached to schools and vocational training institutions will provide additional facilities to enable out-of-school people, irrespective of age, to receive training in various skills and trades.

(v) Higher education will be made selective; only capable young men and women would be encouraged to go into universities. Highly trained people will be turned out by universities only in such numbers as would be required by the different sectors of the growing economy.

(vi) Steps will be taken to spread effective adult literacy throughout the country. Use will be made of the secondary and college level student population in this regard as well as mass-media such as radio and television.

(vii) Sports and cultural activities, will be encouraged in all educational institutions and outside.

(viii) Female education will be given special attention particularly with the objective of turning out teachers for the primary and secondary schools.

TABLE XIV-2

Education and Training

Financial Allocation and Breakdown of Costs by Sub-Sectors.

(Taka in crore)

Sub-Sectors	Total	Percentage of allocation.	Private subsistence investment.	Percentage of private investment as against allocation.
1	2	3	4	5
1. Primary Education ..	57·722	17·91	4·021	7·00
(a) Construction and consolidation ...	33·000			
(b) Instructional materials	8·342			
(c) Text-books	7·380			
(d) Salaries of additional teachers for double shift programme	9·000			
2. Secondary Education ..	59·880	18·58	3·407	5·70
(a) Construction, consolidation and upgrading ..	24·950			
(b) Teaching materials	0·210			
(c) Text-books	5·720			
(d) Diversification of the curricula ..	9·000			
(e) Central Laboratories	20·000			

1		2	3	4	5
3. College Education		24·700	7·66	2·717	11·00
(a) Setting up of Intermediate Colleges	..	2·000			
(b) Rationalisation of Intermediate Colleges	..	6·000			
(c) Upgrading of Intermediate Colleges into Degree Colleges	..	2·400			
(d) Rationalisation of Degree Colleges	..	4·000			
(e) Setting up of 'Science Wings'	..	8·000			
(f) Setting up of 'Home Management Wings'	..	0·300			
(g) Upliftment of College Education	..	2·000			
4. Teacher Education		16·000	4·97	...	...
(a) Primary Teachers' Training Institutes	..	10·500			
(*i*) New (15)	..	7·500			
(*ii*) Consolidation	..	3·000			
(b) Secondary Teachers' Training Institutes	..	3·000			
(*i*) New (4)	..	2·000			
(*ii*) Consolidation	..	1·000			
(c) Education Extension Centre (New- 1)	..	0·500			
(d) Institute for Diversified Curricula (1)	..	0·500			
(e) In-service Training of Primary and Secondary Teachers	..	1·500			
5. Technical Education		50·000	15·51	3·164	6·33
(a) Degree	..	5·000			
(b) Technical	..	9·000			
(c) Commercial	..	2·000			
(d) Trade and Craft	..	17·000			
(e) Community Workshops (200)	..	11·000			
(f) Educational Equipment Bureau	..	0·500			
(g) Teacher Training	..	0·500			
(h) Scholarships	..	5·000			
6. University Education	..	35·000	10·86	...	...
(a) Post-Graduate Studies and a College of Agriculture at Dinajpur	..	3·500			
(b) Universities	..	31·500			
7. Other Educational Activities	..	30·000	9·31	...	...
(a) Sports and Physical Education	..	5·000			
(b) Special Schools	..	1·000			
(c) Scholarships	..	14·000			
(d) Archives & Museums	..	2·000			
(e) Cultural Activities	..	4·000			
(f) Libraries	..	2·500			
(g) Institute of Performing Arts	..	1·500			
8. Non-formal Education including Adult Literacy and Mass Education	..	40·000	12·41	20·000	50·00
9. Educational Radio and Television	..	1·000	·31	...	...
10. Educational Planning & Management Academy	..	2·000	·62	...	...
11. Social Science Research Council	..	2·000	·62	...	...
12. Bangladesh Institute of Development Economics	..	2·500	·78	...	...
13. Research and Planning	...	1·500	·46	...	...
Total (Education)	..	322·302	100·00	33·309	..
14. Labour Welfare and Training		27·698	...	...	...
Total (Education and Manpower)	..	350·000	...	33·309	

TABLE XIV-2·1

Education and Training

First Five Year Plan Targets

Stage	Stock in June, 1972 (In lakh)	Additional enrolment (In lakh)	Stock in July, 1978 (In lakh)	Percentage increase	Per cent of total student enrolment	Percentage of the age-group	Total investment (Taka in crore)
Primary	60·00	25·94	85·94	43	72·4	73	57·722
Secondary	17·00	9·62	26·62	57	22·5	23·5	59·880
Lower Secondary (VI-VIII) ...	11·73	7·72	19·45	66			
Secondary (IX-X)	5·27	1·90	7·17	36			
Teacher Education	0·10	0·15	0·25	150	0·2	—	16·000
College	3·28	1·72	5·00	52	4·2	—	24·700
Intermediate	2·30	1·20	3·50	52			
Degree	0·98	0·52	1·50	53			
Technical Education	0·18	0·31	0·49	172	0·4	—	50·000
Universities	0·24	0·15	0·39	63	0·3	—	35·000

14·1·3 Primary Education

A. *Introduction*

The main objective of primary education is to teach three R's to a child for increasing his capacity to assimilate information and communicate with others. It also opens up for him the vast world which is outside his immediate experience. Depending on the course content he also learns the elements of personal hygiene, discipline and group behaviour; all of which make him a better worker and also a better citizen.

Provision of universal primary education, however, requires an enormous investment, mostly capital, for construction of permanent school buildings in abundance. The alternative is to have school buildings with local materials the costs of which are lower than those of pucca structures and to introduce measures that would increase the efficiency of the existing facilities. In many developing countries the school systems are now going for inexpensive but functional school construction programmes. To assist universal primary education, it is necessary that we go for such inexpensive semi-pucca construction by using the materials that are used by the local community for their own housing requirements.

One important economy measure in this level as well as for other levels is to operate the schools on a double shift basis. The measure would increase enrolment capacity, and would reduce *per capita* development and recurring costs. The Primary

schools should operate for 220 days in a year, and should be used for two shifts with teachers teaching in both the shifts. Each teacher would teach groups of 50 pupils, each shift receiving an average of three and a half hours of instruction per day.

Most of our primary schools are five-teacher institutions. To relieve pressure on them, they would be manned by seven teachers in schools which will introduce double shift during the Plan. New teachers would be preferably female.

TABLE XIV-3

Primary Education: Projected Enrolment

(In lakh)

Year	Enrolment (I-V)				Age-group Population			Enrolment as % of age-group Population			Additional Enrolment		
	Total	Boys	Girls	Ratio	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
1972-73	60·0	40·0	20·0	67:33	102·6	52·7	49·9	58	76	40	—	—	—
1973-74	66·3	44·4	21·9	67:33	105·8	54·0	51·8	63	82	42	6·3	4·4	1·9
1974-75	72·0	47·5	24·5	66:34	108·8	55·5	53·3	66	86	46	5·7	3·1	2·6
1975-76	77·2	50·2	27·0	65:35	111·7	57·0	54.7	69	88	49	5·2	2·7	2·5
1976-77	81·9	52·4	29·5	64:36	114·6	58·5	56·1	71	90	52	4·7	2·2	2·5
1977-78	85·9	54·1	31·8	63:37	117·5	59·9	57·6	73	90	55	4·0	1·7	2·3

B. *Objectives*

The following objectives have been kept in view while formulating the programmes of this sub-sector (Tables XIV-3 and XIV-3·1):

(i) The total enrolment will go up by about 26·0 lakh from a base of 60·0 lakh to 85·94 lakh.

(ii) The percentage of primary age-group students attending schools will increase from 58 per cent to 73 per cent in 1978.

(iii) Ninety per cent of the boys of primary age-group will be given access to primary education during the Plan, compared to 76 per cent now attending the schools.

(iv) Participation of girls will be accelerated. At present, 40 per cent of the girls of primary age-group attend schools; this will be raised to 55 per cent during the Plan. This will lead to an increase in the actual enrolment of girls in the system by 11·8 lakh compared to 14·1 lakh for boys.

(v) The curriculam at the primary level will be revised to make it more relevant to real life obtaining in the country.

(vi) Text-books, writing and instructional materials will be supplied to all children free of cost or at subsidised rates.

(vii) Drop-out rate will be reduced from 63 per cent to 52 per cent by undertaking supplementary and non-formal measures such as well-designed educational programmes through radio and television. Innovative measures such as provision of feeder schools, child feeding, female teachers, sports and

recreational facilities and synchronisation of holiday with crop seasons, will be introduced to reduce drop-out between Class I and Class II, where the problem is more acute;

(viii) Educated housewives will be encouraged to teach in primary schools.

C. *Programmes*

The following are the programmes of primary education:

(i) Double shift will be introduced in 5,000 primary schools, for which existing facilities will be expanded and developed. In doing so, schools which were not developed previously will be given preference. The schools will enrol a total of 20 lakh, of which 10 lakh will be additional enrolment.

(ii) 5,000 new schools will be established to cater to the enrolment of 10 lakh pupils. Facilities for double shift programme will also be available in these schools, although immediately they may operate on a single shift basis due to non-availability of students within the vicinity of the schools.

(iii) The programmes of the 15,000 primary schools which have already been developed will be consolidated to permit optimum enrolment (250). The remaining 10,500 schools will operate at the current level (175). The total enrolment in these schools will be 55·9 lakh including the additional enrolment of about 6·0 lakh.

(iv) Of the 35,500 primary schools at the end of the Plan period, 71 per cent will be fully developed. The schools thus developed with full facilities for a double shift operation will provide a base to permit universal primary education during subsequent Plan periods.

(v) All primary schools will receive necessary teaching materials to improve the quality of instruction.

(vi) One transistor set would be made available to each primary school for receiving the instructional programmes of the Bangladesh Radio.

(vii) Elementary courses on sanitation, health, nursing, population education and ethics will be introduced in the primary schools.

(viii) The projected enrolment of additional 26 lakh can be ensured by increasing participation of girls. To achieve this end, a conducive climate of opinion will be created in the country by concerted social and political efforts and through non-formal activities.

(ix) About 9 per cent of the students of primary schools are over-aged. This percentage will decrease with the increase in retention rates and intake of boys and girls in the school system at the age of six.

A sum of Tk. 57·722 crore which is about 18 per cent of the total allocation in the education sector has been earmarked for the development of primary education during Plan (Table XIV-2). Of this, Tk. 4·021 crore is expected to be contributed by the private sector in the form of land donated for schools. Ten per cent of the materials required for reconstruction of old schools and establishment of new schools are also expected to be donated by the villagers. They are also expected to contribute 25 per cent of the labour charges for such work.

TABLE XIV-3·1

Primary Education : Class-wise Breakdown of Projected Enrolment

(In lakh)

Year	Class-I			Class-II			Class-III			Class-IV			Class-V		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
1972-73	22·8	14·2	8·6	13·2	9·0	4·2	10·2	7·0	3·2	7·8	5·6	2·2	6·0	4·2	1·8
1973-74	23·9	15·1	8·8	15·1	10·1	5·0	11·6	8·0	3·6	8·9	6·3	2·6	6·8	4·9	1·9
1974-75	25·1	15·6	9·5	15·8	10·4	5·4	13·3	9·0	4·3	10·1	7·0	3·1	7·7	5·5	2·2
1975-76	26·4	16·0	10·4	16·6	10·8	5·8	13·9	9·3	4·6	11·5	8·0	3·5	8·8	6·1	2·7
1976-77	27·8	16·6	11·2	17·4	11·1	6·3	14·6	9·6	5·0	12·1	8·2	3·9	10·0	6·9	3·1
1977-78	29·1	17·2	11·9	18·3	11·5	6·8	15·3	9·9	5·4	12·7	8·4	4·3	10·5	7·1	3·4

14. 1. 4 Secondary Education

A. Introduction

With the advancement of technology and economic development, secondary education no longer remains merely a preparatory stage for higher education. Since students vary widely in ambition and in abilities, many of them may not continue with their studies, due to lack of finance, motivation or facilities, and may like to enter the labour market directly or through a vocational training institution.

To meet this changing demand secondary education has to be diversified with provision of courses adapted to the needs of those who will terminate their formal education at this stage, and wish to acquire skills needed to earn their living. There should, therefore, be a special emphasis on science and vocation-oriented courses and training at this level. The secondary students should also be aware of the implications of a rapidly growing population on economic and social development. This can be done by providing, *inter-alia*, appropriate contents on population education, dynamics, and planning within the curriculum.

Secondary level education and the training, specially in science, technical and vocational subjects would be developed in keeping with the demand of the labour market. The programme would be flexible and responsive to the needs of industry, commerce and agriculture of the country. Most of the equipment and training materials required for practical work and on-the-job training would be organised through co-operation of the prospective employers. Laboratories and workshops would be adequately equipped to supplement the facilities already available with the employers and would be standardised to provide training.

Because of high density of population it is possible to economise in the use of laboratory equipment by setting up central laboratories and community workshops which will expedite the growth of diversified and vocational education in Bangladesh. Central laboratories established in rural and urban centres, will cater to the needs of science and diversified education. This is the only alternative to separate laboratories in each of the secondary schools offering diversified education. These laboratories will have teachers and teaching facilities for science, agriculture, home management, nursing and other allied subjects. Students of classes IX and X will go to a central laboratory once or twice a week, to attend practical classes, while theoretical instructions would be imparted in their own schools. The total instruction would also be supplemented by radio and television lessons wherever possible. The laboratory would be manned by qualified full time staff and will operate for 6 days a week for 8 to 10 hours a day.

Community workshop will primarily supplement lower secondary education (class-VIII) and would be available to those who would not go for higher education and to the out-of-school youths. The community workshops will cater to the needs of three groups of people:

(i) Practical training for Industrial Arts group at secondary level;
(ii) Vocational training to class VIII leavers in various trades and crafts; and
(iii) Improving skills of out-of-school youths with little or no formal education. Participants would spend most of their time on job training and comparatively less time on classroom instruction.

Community workshops would not be a part of the formal school system but would be closely related to it. If necessary, school facilities would be available beyond regular school hours for theoretical instruction for the participants of the community workshops. Regular instructors and staff would be employed to maintain these workshops. The training programme may range from four months to one year depending on the need of individual groups and regions and will include programmes such as constructions, carpentry, electrification, masonry and power pump operation. This may also cover home management, health, cottage crafts and other vocational trades as per skill needs of the area.

Further innovations like change of basic instructional unit, individualised instruction in science and vocational education, and modification of the roles of students and teachers by encouraging the senior students to undertake some teaching will also be attempted on an experimental basis.

Some of the secondary schools have already adopted double shift system to meet the demand for increased enrolment. The double shift system economises the use of physical facilities but not in the use of teachers. To meet the existing acute shortage of science teachers, particularly in secondary schools, suitable non-conventional teaching methods may be adopted. In addition, attempts will be made to utilise the services of science graduates employed outside the school system to teach science on a part-time basis.

B. *Objectives*

The objectives of the secondary education programme are stated below :

(i) to increase enrolment by 9·62 lakh. The total enrolment will increase by 56 per cent, *i. e.*, from 17·0 lakh to 26·62 lakh (Tables XIV-4 & XIV-4·1);

(ii) to raise the ratio of enrolment of the children in the secondary age-group from 17·2 per cent to about 23·5 per cent (Tables XIV-4 & XIV-4·1);

(iii) to provide science and vocational education to 40 per cent of the students enrolled in classes IX and X, from the existing 30 per cent;

(iv) to integrate vocational education with academic education ;

(v) to establish central laboratories and community workshops in growth centres.

C. *Programmes*

During the next five years the number of new entrants in classes VI—VIII will be far larger than that in classes IX-X. Provision would be made for an additional enrolment of 7·72 lakh at the junior level, *i. e.* from 11·73 lakh in 1972 to 19·45 lakh in 1978 (Table XIV-4·2). This represents an increase of 66 per cent. The following measures would be adopted to absorb the additional enrolment :—

(i) Establishment of 625 new junior high schools to create facilities for about 0·93 lakh students ;

(ii) Double shifts in 50% of urban schools (600) and 19% of rural schools (935) to absorb 3·1 lakh students : (Table XIV-4·2) ;

(iii) Introduction of classes VI—VIII instructions in 1530 primary schools in the afternoon where there would be no double shift for primary education to accommodate additional 2·3 lakh students (Table XIV-4·2);

(iv) Consolidation of existing 4,000 junior and secondary schools to achieve an optimum class room size of 50, to accommodate an additional 2·0 lakh students.

In the upper level (classes IX-X), expansion would be relatively moderate. Compared to 66 per cent at the middle level only 36 per cent increase is envisaged at the upper level. An additional enrolment of 1·9 lakh will raise the enrolment level from 5·3 lakh to 7·2 lakh. The thrust would be on science and diversified education. Enrolment in science would increase by 70 per cent, agriculture by 355 per cent, home management/nursing by 275 per cent, industrial arts by 150 per cent and commerce by 36 per cent in the plan period (Table XIV-4·2).

During the Plan about 127,500 places will be created to meet the needs of science and diversified education. Of these, 64,000 will be for science, 19,500 for agriculture, 22,000 for home management/nursing, 3,000 for industrial arts and 19,000 for commerce. In order to meet the targets of enrolment, central laboratories (200) and community workshops (200) will be established in growth centres. Science teaching units will be provided in schools which does not have access to central laboratories. Wireless receiving sets will be supplied to all high schools of Bangladesh. Television will also be provided to schools with electricity.

A sum of Tk. 59·880 crore which constitutes about 18·58 per cent of the amount allocated to the Education Sector has been earmarked for the development of secondary education (Tables XIV-2). The local communities are also expected to contribute to this development, the value of which has been estimated to be about 3·407 crore. Fifty per cent of all the lands required for building new schools are expected to be donated by the villagers themselves. As in the case of the primary schools, they are also expected to donate materials and labour for reconstruction of old schools and building of new schools.

TABLE XIV-4

Secondary Education : Projected Enrolment

(In lakh)

Year	Total Enrolment VI-X				Age-group Population			Enrolment as % of Age-group Population			Additional Enrolment		
	Total	Boys	Girls	Ratio	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
1972-73	17·00	14·28	2.72	84:16	98·90	50·85	48·05	17·2	27·6	5·7	...	...	...
1973-74	17·90	14·86	3·04	83:17	102·00	52·00	50·00	17·5	28·8	6·1	0·90	0·58	0·32
1974-75	19·31	15·83	3·48	82:18	104·00	54·00	50·00	18·5	29·3	6·9	1·41	0·97	0·44
1975-76	21·08	17·07	4·01	81:19	107·70	55·40	52·30	19·6	30·8	7·7	1·77	1·24	0·53
1976-77	23·52	18·82	4·70	80:20	110·77	57·00	53·77	21·2	33·0	8·7	2·44	1·75	0·69
1977-78	26·62	21·03	5·59	79:21	113·30	58·30	55·00	23·5	36·1	10·2	3·10	2·21	0·89

TABLE XIV-4·1

Secondary Education : Class-wise Breakdown of Projected Enrolment.

(In lakh)

Year	Class-VI			Class-VII			Class-VIII			Class-IX			Class-X		
	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls	Total	Boys	Girls
1972-73	4·42	3·62	0·80	3·74	3·00	0·74	3·57	3·03	0·54	2·72	2·39	0·33	2·55	2·24	0.31
1973-74	4·80	3·89	0·91	3·89	3·07	0·82	3·59	3·02	0·57	3·04	2·64	0·40	2·58	2·24	0·34
1974-75	5·43	4·30	1·13	4·22	3·33	0·89	3·72	3·09	0·63	3·05	2·62	0·43	2·89	2·49	0·40
1975-76	6·18	4·88	1·30	4·78	3·73	1·05	4·05	3·31	0·74	3·17	2·69	0·48	2·90	2·46	0·44
1976-77	7·04	5·49	1·55	5·44	4·19	1·25	4·59	3·72	0·87	3·44	2·89	0·55	3·01	2·53	0·48
1977-78	8·03	6·18	1·85	6·20	4·71	1·49	5·22	4·19	1·03	3·90	3·24	0·66	3·27	2·71	0·56

TABLE XIV-4-2

Secondary Education : Requirement of Additional Facilities (1973—78)

(In lakh)

Classes	Stock in June, 1973	Stock in July, 1978	Additional places within Plan period	Percentage increase over the period
VI—VIII	11·730	19·450	7·720	66
IX & X	5·275	7·170	1·895	36
(a) Humanities	3·680	4·300	0·620	17
(b) Commerce	0·530	0·720	0·190	36
(c) Science	0·910	1·550	0·640	70
(d) Agriculture	0·055	0·250	0·195	355
(e) Industrial Arts	0·020	0·050	0·030	150
(f) Home Management and Nursing	0·080	0·300	0·220	275

Note 1. Additional places will be created by—

(a) consolidation of existing High and Junior Schools (4,000)

(b) Double shifts in 50% urban schools (600) and 19% of rural schools (935).

(c) Initiation of classes VI—VIII in 1,530 Primary Schools where there will be no double shifts.

(d) Establishment of 625 new Junior High Schools.

2. Additional places in diversified education would be created by establishing central laboratories, teaching units and community workshops.

14·1·5 Teacher Education

A. Introduction

Next to students, teachers are the most important and the most expensive factor of an educational system, and teacher training is the heart of any educational plan. The efficiency and performance of the educational system entirely depend on the quality of instruction imparted, which in turn, rests on the quality of teachers. Standard of education can be raised more easily and with much lower cost through effective teacher training than any other activity. But, in the past we paid inadequate attention and funds to teacher training. The programme for the supply, training, recruitment and utilisation of teachers, was not given desired priority nor were measures taken to build up the under-privileged and low status teaching profession. In the Plan it is proposed to correct the previous gaps and to provide utmost attention to teacher education.

Schools face difficulties in recruiting qualified teachers in science and in technical subjects, due to their limited availability and higher demand elsewhere in the economy. In order to ease the situation, the concept of non-conventional teaching would be brought within the formal system. This would be attained :

- by allowing technicians and skilled workers to offer practical instructions in schools, in central laboratories and in community workshops as part-time instructors ;
- by inviting and by creating a pool of talent available in the school community as parents, guardians, patrons, in respect of science, agriculture, veterinary, health and related disciplines and to make them a regular component of the school teaching programme ; and
- by utilising the services of the retired but experienced officials, teachers, etc. who are prepared to teach for the pleasure of it.

For the purpose, part-time posts would be created and funds would be allocated in the development budget.

At the primary level the percentage of women teachers is only three, while at the secondary level it is eight. Most of these women teachers are teaching in schools located in the urban areas. Some sample surveys indicate that at the primary level, the female teachers are mostly fresh entrants and are still unmarried, while at the secondary level many of the teachers are housewives. There seems to be a direct correlation between the employment of women teachers and enrolment and attendance of girls in schools. In order to attract the girls to schools, women teachers, specially housewives, will be encouraged to return to schools. If necessary, academic qualifications will be relaxed to attract more of them. Further, they would be absorbed only in schools which are not far from their homes.

Many of the trained teachers are obliged to carry on duties in schools which have no direct bearing on teaching. These vary from administrative matters to some routine work which can be performed by non-trained teachers. It would be desirable to relieve the trained teachers of those non-academic duties and use them exclusively for teaching.

Teachers are usually low paid and even then the teaching profession has always attracted some bright people. Proper incentives are necessary to retain them in the teaching profession. Some of the proposed measures are :

— The salary of a teacher should be fixed on the basis of his qualifications and not on the post alone. If necessary, special posts may be created for particularly able teachers to enable them to get adequate remuneration.

— The dependents of the teachers should be allowed to enjoy free studentship.

— The teachers should be provided with opportunities to improve their qualifications and get promoted to higher positions.

Many of the primary school teachers enter the profession because of their inability to go for higher studies due to financial difficulties. The possibility of vertical movement within the profession would serve as a great incentive for them. Trained teachers from the Primary Training Institutes with about 3 to 5 years of teaching experience should be allowed to go for higher education, to improve their employment opportunities.

With increased enrolment of about 85·94 lakh, the number of primary teachers would increase from 1·24 lakh to 1·87 lakh. (Table XIV-5), an increase of about 51 per cent over the Plan period. In absolute terms, it would be an addition of only 63,500 but the number of new recruits will be about 93,000; the additional 29,500 teachers are required to replace those who will retire or leave the profession. At present, about 66 per cent of the teachers numbering about 82,000 are trained. Of this, at least 16,000 trained teachers would be affected by the normal turnover during the Plan. The 48 primary training institutions with existing capacity can produce about 40,000 trained teachers. Therefore, the total number of trained teachers will be not more than 1,06,000 which is only about 56 per cent of the proposed total teaching force. It is, therefore, necessary to increase substantially the primary teacher training facilities in the country, even to maintain the present rate of trained teachers.

The situation is similar with secondary teachers. Requirement for secondary will go up by about 50 per cent *i. e.* from 60,500 to 90,600 by 1978 (Table XIV-5.1). In addition, 14,000 will be required to meet the replacement demand. Only 29 per cent of the existing teachers numbering about 18,000 are trained. The current training capacity of the 12 Teachers' Training Colleges is 2,500 annually (Table-XIV-5·3) which, together with the existing number of trained teachers, will comprise 34 per cent of the teaching force. This means that with the existing training facilities alone, the percentage of trained teachers will rise only slightly (5%) during the next five years. Raising the percentage of trained teachers from 29 to 43 constitutes a foremost objective of the Plan.

A large portion of the new entrants in classes IX & X will join science, commerce and vocational groups. The requirement for specialised teachers will be about 4,250 of whom 2,133 will be for science, 650 for agriculture, 734 for home management and nursing, 100 for industrial arts and 633 for commerce.

In spite of large requirement of trained teachers, the outturn of the Primary Training Institutes and the Teachers' Training Colleges have to remain idle for months before entry into the teaching profession, mainly due to the inefficiency of the recruitment procedure. In this process of waiting some of them get absorbed elsewhere resulting in their loss to teaching profession altogether. In order to avoid this wastage, the possibility of offering them advance employment or guarantee for re-employment, even before they have completed their training, should be carefully considered.

B. *Objectives*

The following objectives have been kept in view in formulating programmes of teacher education.

(i) To increase the number of primary and secondary teachers by 5 per cent *i. e.* from 1,84,500 teachers to 2,78,000 teachers within the plan period.

(ii) To accelerate recruitment of female teachers and to increase their number by 289 per cent *i. e.* from 9,500 to 37,000 teachers.

(iii) To raise the number and proportion of trained teachers, by establishing new training institutions and by adopting suitable measures for the maximum use of the existing facilities.

(iv) To increase the number of graduate science teachers from 1,200 to 5,000. At present there are about 3,200 teachers teaching science subjects of whom only 1,200 are science graduates. During the Plan only science graduates will be employed to teach science in all Schools.

(v) To provide in-service training of various forms and durations during vacations or other appropriate times in existing schools and colleges, to the teachers for improving their instructional ability.

(vi) To provide facilities for long term training of science and diversified teachers.

(vii) To provide instructions over radio and television to supplement the teaching in schools which will also upgrade the teachers' own knowledge.

C. *Programmes*

The following are the programmes of teacher education :

(i) To establish additional 15 primary training institutions with about 6,000 pupil places of which 3 would be exclusively for female teachers (Table XIV-5·2).

(ii) To establish 4 new teachers' training colleges with a training capacity of 2,000 of which one would be exclusively for training of science teachers (Table XIV-5·3).

(iii) To establish one new institute to train teachers in agriculture, commerce, home management and industrial arts.

(iv) To establish a new Education Extension Centre preferably in North Bengal to cater to the need of that region, special short term and long term courses would be instituted for the teacher training at the PTI's and TTC's and research experimentation on the curriculum would be encouraged.

(v) To provide residential facilities for about 50 per cent of the primary and secondary teachers undergoing training. Semi-permanent structures using local materials will be constructed for such residential accommodation.

TABLE XIV-5

Teacher Education : Requirement of Primary Teachers

Item		1973-74	1974-75	1975-76	1976-77	1977-78
Stock at the beginning of the year	T	124,146	134,246	145,546	158,546	173,246
	M	120,146	127,026	134,706	143,586	153,666
	F	4,000	7,220	10,840	14,960	19,580
Wastage @ 4% (death, retirement, migration)	T	4,966	5,370	5,822	6,342	6,930
	M	4,806	5,081	5,388	5,744	6,147
	F	160	289	434	598	783
Net Stock	T	119,180	128,876	139,724	152,204	166,316
	M	115,340	121,945	129,318	137,842	147,519
	F	3,840	6,931	10,406	14,362	18,797
Fresh Entry	T	15,066	16,670	18,822	21,042	21,330
	M	11,686	12,761	14,268	15,824	15,527
	F	3,380	3,909	4,554	5,218	5,803
Total Stock at the end of the year	T	134,246	145,546	158,546	173,246	187,646
	M	127,026	134,706	143,586	153,666	163,046
	F	7,220	10,840	14,960	19,580	24,600

TABLE XIV-5·1

Teacher Education : Requirement of Secondary Teachers

Item		Bench Mark June, 1972	1973-74	1974-75	1975-76	1976-77	1977-78
Stock at the beginning of the year	T	60,500	63,000	65,600	69,600	74,700	81,700
	M	55,000	57,000	59,000	62,364	66,253	71,589
	F	5,500	6,000	6,600	7,236	8,447	10,111
Wastage @ 4 per cent (death retirement, migration)	T	2,200	2,500	2,624	2,784	2,988	3,268
	M	2,000	2,250	2,360	2,495	2,652	2,864
	F	200	250	264	289	336	404
Net Stock		58,300	60,500	62,976	66,816	71,712	78,432
Science Teacher	T	1,200	1,300	2,400	3,000	4,000	5,000
	M	900	975	2,097	2,600	3,150	4,000
	F	300	325	303	400	850	1,000
Stock at the end of the year	T	63,000	65,600	69,600	74,700	81,700	90,600
	M	57,000	59,000	62,364	66,253	71,589	78,216
	F	6,000	6,600	7,236	8,447	10,111	12,384

TABLE XIV-5·2

Teacher Education : Projected Supply of Trained Teachers for Primary Level

(all figures are cumulative)

Year	Supply From			Stock of Trained Teachers excluding wastage	Total Teacher requirement	Percentage of Trained Teacher
	Existing source	Introduction of double shift	New P.T.I's under Plan			
1972-73	...	...	...	82,000	124,146	66
1973-74	8,000	...	...	88,770	156,746	56
1974-75	16,000	1,400	...	96,151	162,046	59
1975-76	24,000	4,200	...	104,983	169,046	62
1976-77	32,000	8,600	2,000	117,464	177,746	66
1977-78	40,000	14,600	6,000	133,593	187,646	71

TABLE XIV-5·3

Teacher Education : Projected Supply of Trained Teachers for Secondary Level

(all figures are cumulative)

Year	Supply From			Stock of Trained Teachers excluding wastage	Total Teacher requirement	Percentage of Trained Teacher
	Existing Source	Introduction of double shift	New T.T.C's under Plan			
1972-73	...	...	...	18,000	60,500	29·7
1973-74	2,500	...	...	20,050	62,600	30·6
1974-75	5,000	800	...	22,912	69,600	33·0
1975-76	7,500	2,400	...	26,585	74,700	35·6
1976-77	10,000	4,800	1,600	32,668	81,700	40·0
1977-78	12,500	7,200	3,600	39,162	90,600	43·2

(vi) To introduce double shift instruction in all the 48 primary training institutes on a phased programme.

(vii) To consolidate the programmes and facilities of the existing 12 teachers' training colleges. Double shift teaching at teachers' training college will be synchronised with double shift classes of adjoining secondary schools for increasing the output of teachers from the existing teachers' training colleges. For example, while one group will attend classes in the morning shift and will have practical teaching in the afternoon, the other group will undertake practice teaching in the morning and receive instructions in the afternoon from the teachers' training colleges. Implementation of this programme will be phased over the Plan period.

(viii) To organise short term in-service training programmes for primary and secondary teachers. A corps of teacher trainers will be recruited and trained for this purpose. In such courses, female teachers would be given preference.

(ix) To decentralize the activities of the Education Extension Centre by organising courses at thanas and sub-divisional headquarters. The centre will pay greater attention to in-service training programmes for the science and diversified teachers;.

(x) To organize special courses for appropriate teachers on class-room use of the instructions provided by the educational broadcasts.

A sum of Tk. 16·00 crore comprising 5% of the Plan allocation to education sector has been earmarked for teachers' education (Table XIV-2).

14.1.6 College Education

A. *Introduction*

The number of institutions imparting higher secondary and college education has increased phenomenally during the last two decades. There are now about 500 colleges in Bangladesh of which as many as 300 teach only up to higher secondary level. Many of these colleges do not possess the minimum necessary facilities to function properly. The mushroom growth of these institutions took place particularly during the sixties. The absence of sufficient avenues of employment coupled with the unwillingness to enter family occupations like farming, on the part of the secondary and higher secondary certificate holders created a tremendous demand for college education. The unemployed degree holders sometimes took initiative in starting such colleges in the rural areas both in the hope of finding employment and with the ideal of rendering some service to the local community. But the major initiative came from the local philanthrophists and other elite as well as Government administrators who wanted to accelerate development in small communities through the establishment of colleges.

In the Plan it is hoped to divert the bulk of the school leavers to institutions where they can receive job-oriented training instead of spending several years on education which is of little worth to their prospective employers. Such a diversion will not be easy to achieve as long as the job opportunities and training facilities for school leavers are limited. Unless public opinion is mobilised, standards of admission tests are raised, and people with inadequate qualifications are prevented from becoming college teachers, the growth in the number of colleges and students cannot be restricted. It will be our endeavour to rationalise and consolidate the existing facilities of the colleges rather than expanding them or adding to their number. Only 10 new intermediate colleges are proposed to be established in Bangladesh during the Plan. No encouragement to unplanned expansion of college education will be given but equal opportunity for higher education will be assured to those who have the merit and the potential for academic excellence. Our aim will be to maximise utilisation of the existing resources and facilities.

In the past, there has been a tendency to upgrade secondary schools into colleges although material facilities for such upgrading and financing were not available. This practice would be discouraged. Of the 500 colleges, not more than 300 offer science courses at intermediate level and enrol only 220 science students per college. The colleges are without sufficient space and lack adequate laboratory facilities. About 100 offer science at the degree level, but their facilities are also totally inadequate. During the Plan, the aim would be to improve standards, especially in science, so that they become an effective base for producing graduates with a solid science bias.

At present, about 3·28 lakh students are on the roll of different colleges in Bangladesh and this is likely to go up to 5·00 lakh during the Plan period. Of this, 3·50 lakh would be for intermediate level and 1·50 lakh for degree level. The increased flow will be channelled to science, commerce and home management education. At intermediate level, academic facilities for science would be increased by 80 per cent, for commerce by 72 per cent and for home management by 483 per cent while for humanities it would be only 22 per cent (Table XIV-6). At the intermediate level, the additional requirements would be about 1,20,000 places; of that 53,100 places would be in science, 22,600 in humanities, 38,500 in commerce and 5,800 in home management education (Table XIV-6). Terminal year requirements of teachers for intermediate and degree level of education are 7,777 and 5,000 respectively (Tables XIV-6·1 and XIV-6·2).

At the degree level, attention would be given to places for science and home management with 111 per cent and 541 per cent increase respectively. Out of 52,000 new places, 20,480 would be for science, 19,782 for commerce, 10,472 for humanities, and 1,266 for home management (Table XIV-6).

At present, 4 Cadet Colleges altogether admit only about 300 students at higher secondary level. Students residing in their own homes would be admitted wherever possible to ensure proper and maximum utilisation of the facilities in these colleges. With proper rationalisation of the facilities, the Cadet Colleges would be able to accommodate about 1,000 day students at this level.

B. *Objectives*

The following objectives will be kept in view while drawing up the development programmes for the colleges :

(i) To allow 52 per cent expansion in enrolment at the intermediate and degree levels;

(ii) To restrict the expansion to science, commerce and home management education;

(iii) To raise the percentage of enrolment of girl students from 8·5 to 14·0 ;

(iv) To improve the standard of science teaching by providing better laboratory and staff facilities ;

(v) To modify the programmes of "home economics" education by relating it to rural homes and home management needs.

C. *Programmes*

The programmes for this sub-sector are as follows :

Intermediate Level

(i) Ten new intermediate colleges would be established at district level each with 1,000 places to cater exclusively to science, commerce and home management education. Of that, half would be for science teaching (500) and the remaining would be shared by home management (200) and commerce education (300).

(ii) A "science wing" comprising a complex of laboratories and class-rooms would be annexed to 100 existing intermediate colleges to accommodate 20,000 science students.

(iii) Enrolment in science courses in the existing 200 intermediate colleges would be raised to 320 per college from the present number of 220 to accommodate 20,000 additional students. Rationalisation of the facilities will be achieved, and where required, laboratory, library and other ancillary facilities will be provided.

(iv) "Home management wing" each with 120 places would be annexed to about 30 colleges to cover both the intermediate and degree level students.

(v) Double shifts would be introduced in 100 selected colleges for 250 students in each for commerce and other courses.

(vi) The facilities in the existing colleges would be consolidated and where possible, double shifts would be introduced to provide enrolment of additional 21,000 students in humanities, 13,000 in commerce and 10,000 in science.

Degree Level

(vii) 100 degree colleges which now offer science instruction on an average of 180 students would be consolidated to attain economies of scale. The most economic size for a science wing appears to be 320 students. The programme will thus accommodate 14,000 additional students.

(viii) Separate shifts would be introduced in the above 100 degree colleges, with 200 students in each shift to accommodate 20,000 commerce students.

(ix) 40 intermediate colleges having science courses would be upgraded to accommodate 160 students each for 6,400 degree students.

(x) The facilities at the existing degree colleges would be consolidated to accommodate the remaining students including those studying humanities.

A sum of Taka 24·7 crore which is about 7·60 per cent of the allocation to the education sector has been earmarked for development of college education during the First Five Year Plan (Table XIV-2). The private sector is expected to contribute Taka 2·717 crore in the form of land, materials and labour charges.

TABLE XIV-6

College Education : Projected Enrolment

Level and Discipline	ENROLMENT				Additional enrolment over the Plan period.		ENROLMENT							
	1972-73		1977-78											
	Number	Percentage distribution	Number	Percentage distribution	Number	Percentage increase over the Plan period	1973-74	Percentage distribution	1974-75	Percentage distribution	1975-76	Percentage distribution	1976-77	Percentage distribution
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Intermediate ...	**2,30,000**	**100**	**3,50,000**	**100**	**1,20,000**	**52**	**2,48,000**	**100**	**2,69,000**	**100**	**2,93,000**	**100**	**3,20,000**	**100**
Humanities ...	1,05,400	45·8	1,28,000	36·6	22,600	22	1,08,180	43·6	1,13,190	42·1	1,16,080	39·6	1,21,860	38·1
Science ...	65,900	28·7	1,19,000	34·0	53,100	80	74,058	29·9	82,875	30·8	94,530	32·3	1,06,379	33·2
Commerce ...	57,500	25·0	96,000	27·4	38,500	72	63,778	25·7	70,100	26·1	78,288	26·7	86,174	26·9
Home Management ...	1,200	0·5	7,000	2·0	5,800	483	1,984	0·8	2,835	1·0	4,102	1·4	5,587	1·8
Degree Pass	**98,000**	**100**	**1,50,000**	**100**	**52,000**	**53**	**1,05,000**	**100**	**1,14,000**	**100**	**1,25,000**	**100**	**1,37,000**	**100**
Humanities ...	49,528	50·6	60,000	40·0	10,472	20	50,490	48·1	51,920	45·5	54,605	43·7	56,910	41·5
Science ...	17,830	18·2	38,310	25·5	20,480	111	20,772	19·8	24,303	21·3	28,465	22·8	33,509	24·5
Commerce ...	30,408	31·0	50,190	33·5	19,782	67	33,270	31·7	37,124	32·6	41,055	32·8	45,322	33·1
Home Management	234	0·2	1,500	1·0	1,266	541	468	0·4	653	0·6	875	0·7	1,259	0·9

TABLE XIV-6·1

College Education : Requirement of Teachers for Intermediate Level

Item	1973-74	1974-75	1975-76	1976-77	1977-78
Stock at the beginning of the year	5,111	5,511	5,977	6,511	7,111
Wastage @ 2% due to death, retirement & migration	102	110	120	130	142
Net stock	5,009	5,401	5,857	6,381	6,969
Fresh entry	502	576	654	730	808
Total stock at the end of the year	5,511	5,977	6,511	7,111	7,777

TABLE XIV-6·2

College Education : Requirement of Teachers for Degree Level

Item	1973-74	1974-75	1975-76	1976-77	1977-78
Stock at the beginning of the year	3,266	3,500	3,800	4,166	4,566
Wastage @ 2% due to death, retirement & migration	65	70	76	83	91
Net stock	3,201	3,430	3,724	4,083	4,475
Fresh entry	299	370	442	483	525
Total stock at the end of the year	3,500	3,800	4,166	4,566	5,000

14·1·7 Technical and Vocational Education

A. *Introduction*

Technical and vocational education facilitates economic development by providing required skills to the new entrants and to the current labour force. The effectiveness of the training is reflected through the trainees' capacity to use their required skill and also in their ability to adopt innovations that foster productivity and growth. Therefore, technical education should be fully co-ordinated with the development programmes and related with the demands generated by broadened access to primary and secondary education.

The limited capacity of the formal training system has resulted in a shortage of intermediate level technicians and craftsmen. As a consequence many school leavers regardless of their training or subject specialisation, were absorbed in technical jobs. Further, due to inefficiencies in labour recruitment, imbalances in the supply of and demand for various kinds of technical personnel have occurred. But the demand for technicians and skilled workers continues to be high. The requirements of technicians, skilled workers, artisans and craftsmen during the Plan have been estimated to be about 75,000. Most of them will be for the agriculture and water sector as pump drivers, tractor drivers and mechanics. Transport, construction, telecommunications and waterways would also need many trained workers.

Evidence of unemployment among technicians has been observed for some time. There are various reasons for such unemployment. Apparently they do not find the salary sufficiently attractive or the work conditions commensurate with their level of training. The employers, on the other hand, do not consider them properly qualified to handle practical problems.

For producing intermediate level technicians and skilled workers, the programmes of technical education, administered by the Directorate of Technical Education, would be co-ordinated fully with the training programme of the Directorate of Public Instruction and the Directorate of Labour. Such co-ordination will help reduce the costs of training. Instruction on double shifts wherever possible, specially in Polytechnic and Monotechnic Institutes, will increase the output of these institutions.

For the acceleration of science and technical education, production of scientific and technical materials within the country will have to be encouraged. The Educational Equipment Development Bureau now functioning under the Directorate of Technical Education has been producing laboratory materials for science and technological education which can be multiplied in great numbers within the country. The Educational Equipment Bureau would be strengthened and made autonomous, and their programmes would be rationalised in consultation with the related industries to meet the new needs.

In many countries, the responsibility of technical training in the form of on-the-job training and apprenticeship is entrusted to the industries in preference to the technical institutions mainly on the argument that the training in the technical institutions is not often geared to the specific needs of the industries. Bangladesh is peculiarly disadvantaged in this regard. Our industries are so few in number, limited in size and inadequate in facilities that it would not be possible for them to undertake this responsibility. Nor would the existing training institutions, despite their updatedness in equipment and in teaching materials, be able to keep pace with the rapid change of technology in the operative industries.

The obvious way to meet the situation would be to organize technical training on a co-operative basis between the operative industries and the training institutions. While the training institutions can take care of the major component of the curricula, the industries can impart at least a part of the practical training. In order to be successful, this arrangement has to be planned and formulated in respect of each institution and for each level of training. To achieve such an objective, the Planning Commission proposes formation of a high powered committee consisting of representatives from the Planning Commission and the Ministries of Education, Labour and Industries, as well as representatives of employers, who would devise the necessary functional mechanism. These representatives must be senior persons with experience in actual training and production management. This Committee would also suggest a mechanism for co-ordinating the training programmes of the various ministries referred to earlier.

B. *Objectives*

The following objectives will be kept in view while adopting development programmes in the field of technical education :

(i) Technical education will be geared to the skill requirements of the country. Efforts will be made to attain self-sufficiency in essential skills required for industry, commerce and modern agriculture within 10 years;

(ii) The annual output of graduate engineers will be increased by about 300 per cent so as to satisfy the requirements of engineers for the plan period.

(iii) The facilities for the production of intermediate level technologists will be expanded by 38 per cent. and those of accountants and secretarials by 113 per cent.

(iv) The facilities for the production of skilled workers will be expanded on a mass scale *i.e.* by about 1,860 per cent, to satisfy the immediate needs of the economy.

(v) An optimum use of all instructional facilities will be effected.

(vi) Student enrolment at the degree level will be raised by 125 per cent, at the diploma level (technical) by 35 per cent, at the diploma level (commerce) by 105 per cent and at the vocational level (skilled workers) by 710 per cent (Table XIV-7). The annual output at the end of the plan period will be 560 graduates at the degree level, 3,862 technicians at the diploma (technical) level, 2,200 technicians at the diploma (commerce) level and about 30,000 skilled workers at the certificate level.

(vii) To facilitate the proposed expansion, the requirement of new teachers will increase by 89 per cent at the degree level, 19 percent at the diploma (technical) level, 105 per cent at the diploma (commerce) level and by about 333 per cent at the certificate level. Teachers' training programmes will accordingly be strengthened.

C. Programmes

The development programmes in the field of technical education are detailed below :

1. Degree Level Engineers
   (i) All development and expansion work of the three Engineering Colleges at Rajshahi, Chittagong and Khulna will be completed.
   (ii) Residential accommodation will be created for 1,216 additional places to accommodate 80 per cent of the student population.

2. Diploma Level Technicians
   (i) Four new Polytechnic Institutes with 1,500 student places will be established.
   (ii) Six existing Technical Institutes will be upgraded into Polytechnic Institutes.
   (iii) Fourteen existing Polytechnic Institutes will be consolidated and completed.
   (iv) Residential accommodation will be created for additional 3,080 places to cover 80 per cent of the enrolment; the total facility will be for 11,800 students.

3. Diploma Level Commerce
   (i) Ten new Commercial Institutes will be established in major commercial areas and will enrol 2,000 additional students by 1978.
   (ii) Existing 16 Commercial Institutes will be consolidated and completed.
   (iii) The existing 16 Commercial Institutes will gradually introduce courses in Bengali Shorthand and Typewriting, while 10 new institutes will offer courses exclusively in Bengali Shorthand and Typewriting.

4. Certificate Level Skilled Workers
   (i) One hundred and twelve Vocational Training Institutes with 22,400 total places will be established in areas where the need for skilled workers is evident.
   (ii) Twelve of these institutes will be set aside for disabled freedom fighters, and special programmes will be devised for their rehabilitation.

(iii) The new institutes will be so coordinated with the secondary schools that the facilities available at these institutes can also be used by students enrolled in the secondary schools. The new institutes will also be developed in close coordination with the community workshops, so that there can be common instructional facilities wherever possible.

(iv) Existing 22 Vocational Institutes will be consolidated and completed.

(v) Thirteen Vocational Institutes already under construction will be completed.

(vi) Three existing Monotechnics functioning under Directorate of Technical Education in glass and ceramics, textiles and leather technology will be expanded.

5. Training of Technical Teachers.

(i) Programmes for the training of teachers will be initiated in keeping with the needs of increased enrolment and of the newly established vocational institutes.

(ii) In-service training programmes now provided by the Institute of Advancement of Science and Technology teaching will be strengthened.

TABLE XIV-7

Technical Education : Targets and Requirement of Additional Facilities

Level	Position in June, 1973		Position in June, 1978		Additional Places	Percentage increase	
	Capacity	Output	Capacity	Output		Enrolment	Output
Degree :							
Engineers	1,220	140	2,740	560	1,520	125	300
Student accommodation	976		2,192		1,216	125	
Teachers	95		180		85	89	
Diploma :							
Technicians	10,900	2,796	14,740	3,862	3,840	35	38
Student accommodation	8,720		11,800		3,080	35	
Teachers	827		985		158	19	
Commercial :							
Accountants and Secretarials	2,550	1,030	5,230	2,200	2,680	105	113
Teachers	127		261			105	
Vocational :							
Skilled workers ...	3,700	1,530	30,000	30,000	26,300	710	1860
Teachers	300		1,300		1,000	333	

TABLE XIV-7.1

Technical Education : Teacher Requirement

Year & Level	Stock at the beginning of the year	Wastage @4% due to death, migrations, etc.	Net stock	Fresh Entry	Stock at the end of the year
1973-74					
Degree	95	4	91	5	96
Diploma (Technician)	827	33	794	33	827
Commercial	127	5	122	30	152
Vocational	300	12	288	212	500
1974-75					
Degree	96	4	92	20	112
Diploma (Technician)	827	33	794	33	827
Commercial	152	6	146	31	177
Vocational	500	20	480	220	700
1975-76					
Degree	112	4	108	24	132
Diploma (Technician)	827	33	794	76	870
Commercial	177	7	170	35	205
Vocational	700	28	672	228	900
1976-77					
Degree	132	5	127	29	156
Diploma (Technician)	870	35	835	88	923
Commercial	205	8	197	35	232
Vocational	900	36	864	236	1,100
1977-78					
Degree	156	6	150	33	183
Diploma (Technician)	923	37	886	99	985
Commercial	232	9	223	38	261
Vocational	1,100	44	1,056	244	1,300

A sum of Tk. 50·00 crore constituting 15·5 per cent of the total allocation of the Education Sector has been earmarked for technical education during the First Five Year Plan. Private sector will be expected to donate land and also some labour and materials for reconstruction of community workshops and vocational institutes. The value of this contribution is expected to be Tk. 3·164 crore.

14·1·8. University Education

A. *Introduction*

While fostering the growth of university education in the country, no conscious attempts were made in the past to co-ordinate their activities in determining the courses of studies and student enrolment in terms of high level manpower requirements. Notwithstanding the allocation of comparatively large sums of money during the last decade, the universities had not succeeded in significantly raising the standards of education and research. Several factors were responsible for this. First, even during the period of British colonial rule, the universities and other institutions of higher learning were centres of protest against

foreign domination and oppression. During the last decade the university students and teachers were held in distrust by the ruling circles of Pakistan because of their undisguised opposition to anti-democratic, authoritarian and illiberal policies followed in the country. The universities were continuously subjected to all kinds of pressures to prohibit free thinking and discussion of the relevant issues of the day. The various attempts at denying academic freedom to these institutions slowly led to a situation where these could no more hope to grow as centres of excellence.

Second, the tremendous pressure of admission into the universities generated by a large number of college leavers with High School Certificates and B. A. & B. Sc. (Pass) degrees with no other opportunities of acquiring a useful skill or employment, made it impossible on the part of the university authorities to limit the number of the university entrants. Many of these students did not have sufficient interest in the subjects they were supposed to study nor did they possess sufficiently high academic background to follow a rigorous course of studies. Their presence in the class-rooms and the laboratories prevented both teachers and the brighter students from making full use of the facilities. Moreover, expansion of student population took place at such a rapid pace that it was not often possible for the universities to recruit highly qualified teachers in adequate numbers or make enough provisions for advanced training for university teachers as a result of which courses had to be given by teachers who did not possess any research experience or advanced training in any field. Teachers were left with very little time for any research because of heavy teaching load.

Third, the teacher-student ratio also fell below 1 : 20 and in many arts subjects it went beyond 1 : 40 or so. This made it impossible for the teachers to organise tutorial classes or pay adequate attention to their students' problems in lecture rooms and laboratories. They could establish very little personal contact with their students outside class-rooms. Lack of any opportunity to enter into serious discussions on the academic problems prevented the students from developing a genuine interest in their subjects. It also did not help the teachers to keep alive their own interests through seminars, discussions, or research activities.

Fourth, the development programmes of the universities in the past primarily related to building modern structures with expensive building materials. The construction programmes for aesthetically satisfying structures have not always led to economising on materials and space. Consequently, larger portion of development expenditure went on bricks and mortars rather than larger faculty, advanced training facilities for faculty members or research. In several disciplines such as physics, chemistry and economics an insufficient number of able scholars was available in the country to establish post-graduate schools exclusively for imparting advanced training up to doctorate level. Necessary facilities were not created because neither the universities nor the Government showed sufficient interest in such ventures.

Development of University education in Bangladesh should not be confined within the limits of will defined campuses. We should throw open the doors of higher education to all those who wish to broaden their intellectual horizon without having to go through the traditional routine of lectures, tutorials at certain fixed hours of the day and also in certain months of the year. Lectures over radio and television by recognised authorities,

correspondence coureses and tutorials by groups of teachers specially appointed for these purposes should be provided. These will help the universities to distinguish those who join the university to get a degree in the hope that such a degree, whatever their preference or performance may be, will open the doors of employment which are otherwise closed to them, from those who come to acquire specialised knowledge. If higher education is not to remain as a preserve of those who have the necessary funds and time to throng the corridors of the university, the innovative measures suggested above will have to be considered.

An urgent need in the field of higher education is the strengthening of post-graduate studies and research and channelling the limited resources effectively for this purpose. The University Grants Commission will draw up schemes in consultation with universities to establish Institutes/Advanced Centres for training and research in certain selected fields. The schemes should aim at encouraging the pursuit of excellence and team work in studies and research and achieve realization of international standards in specific fields. With these objectives in view, it is proposed to make separate allocation of funds for development of Institutes/ Advanced Centres in the universities and put it at the disposal of the University Grants Commission.

The allocation for university education is Taka 35·00 crore including Taka 3·5 crore for post-graduate studies and research and a College of Agriculture at Dinajpur attached to Rajshahi University (Table XIV-2). The allocation represents 11 per cent of the sectoral allocation. The universities at present have about 0·30 per cent of the total student enrolment and as the relatively high allocation reflects the attention paid to the sub-sector for continuance of opportunities and maintenance of standards of higher education. The magnitude of expansion of university education in Bangladesh has to be determined wihin the context of availability of resources for the current Plan. Within such constraints, attempts will be made to reach economies of scale but not at the sacrifice of standards.

B. *Objectives*

The following objectives have been kept in mind while formulating the pattern of development of university education in the country during the First Plan:

(i) To allow growth in enrolment in the older universities which can admit students without embarking on a large scale building programme for providing residential accommodation to the staff and students.

(ii) To facilitate development of the new universities so as to enable them to reach the desired size within the First Plan.

(iii) To encourage the technical universities to develop their full potential so that they can meet the high level technological manpower needs of the country.

(iv) To set up new affiliating universities which will prepare syllabi, courses of studies and conduct examinations of the colleges under them. This is necessary to help the existing universities to grow as centres of excellence through revision of syllabi and courses of studies, introduction of new teaching methods and admission of only such students who can cope with high standards of education in the universities.

(v) To increase enrolment by about 13 per cent per annum. The total increases would be 64 per cent over the Plan period. In absolute terms, it would mean an increase from a base of 23,726 to 39,000 (Table XIV-8).

(vi) To follow 3 basic principles while expanding enrolment in various disciplines:

—accelerated expansion of under-graduate and post-graduate levels in science and technological fields ;

—normal growth in disciplines where manpower demands are relatively moderate;

—maintenance of existing enrolment levels in disciplines where surpluses are evident.

(vii) To narrow the gap between science and arts students by raising the ratio of student population to 37 : 63 from existing 32 : 68 by the end of the Plan period.

(viii) To meet the existing critical shortage of science and science based manpower. The under-graduate programmes of the universities (and in colleges where such courses are offered) would pay attention to these requirments as expeditiously as possible. A major share of the financial allocation for the universities would be directed to this end. With the expansion programme now envisaged, it would be possible to meet the demand for science-graduates by 1985.

C. *Programmes*

The Plan target for university education is detailed below :

(i) In four general universities enrolment will be increased by 71 per cent from 19,300 in 1972 to 33,000 in 1978 (Table XIV-8).

(ii) Of the additional 13,700 student places, at least 43 per cent *i.e.* 5,900 places will be created for science subjects in order to reach a ratio of 37:63 between science and humanities by 1978, compared to 32:68 of 1972.

(iii) Enrolment in science will increase by about 94 per cent while that in humanities will be increased by 60 per cent.

(iv) For Engineering University, the projected increase in enrolment is 28 per cent *i.e.* from 1,944 to 2,500 ; this excludes enrolment in the Engineering Colleges.

(v) Engineering University will devote greater attention to post-graduate studies and research.

(vi) In the Agricultural University, enrolment will be increased by 40 per cent *i.e.* from 2,500 to 3,500. Of the additional enrolment, 50 per cent will be for agricultural extension and rural programmes.

(vii) The number of university teachers will increase by 75 per cent and would reach the target of 2,453 in 1978 from 1,403 in 1972.

(viii) Three hundred fellowships will be arranged for advanced training of the faculty members.

(ix) The ratio of resident and non-resident students will be raised from the existing 40:60 to 50:50. Preference will be given to students taking science and technological courses in allotting residential accommodation.

New schools for post-graduate studies and research have been proposed by various universities. The following are considered to be of special significance for Bangladesh :

Dacca University	:	Institute of Social Science, and Institute of Natural Science
Chittagong University	:	Institute of Atmospheric Studies and Occanography
Rajshahi University	:	Institute of Bangladesh Studies
Jahangirnagar University	:	Institute of Rural Studies
Engineering University	:	Institute of Flood Control

As mentioned earlier, the University Grants Commission will consider these proposals and schemes will be formulated in consultation with the Universities. The proposal to create a College of Agriculture at Dinajpur attached to the University of Rajshahi will also be examined by the University Grants Commission. A separate allocation of Taka 50·00 lakh has been made for the purpose.

TABLE XIV-8

University Education : Projected Enrolment and Requirement of Teachers

Universities	Enrolment : 1972-73			Enrolment : 1977-78			Percentage increase			No. of teachers 1972-73			No. of teachers 1977-78			Percentage increase		
	Total	Science	Arts & others	Total	Science	Arts & others	Total	Science	Arts & others	Total	Science	Arts & others	Total	Science	Arts & others	Total	Science	Arts & others
Dacca University ...	10,084	2,925	7,159	15,000	5,000	10,000	49	71	40	454	210	244	833	333	500	83	59	105
Rajshahi University ...	6,624	2,568	4,056	10,000	4,000	6,000	51	56	48	280	126	154	567	267	300	102	112	95
Chittagong University...	2,174	501	1,673	5,000	2,000	3,000	130	299	79	160	46	114	283	133	150	77	189	32
Jahangirnagar University	405	283	122	3,000	1,200	1,800	641	324	1,375	44	30	14	170	80	90	286	166	543
Sub-Total	19,287	6,277	13,010	33,000	12,200	20,800	71	94	60	938	412	526	1,853	813	1,040	98	97	98
Engineering University ...	1,944	...	...	2,500	...	...	28	...	...	197	...	...	250	...	...	27	...	...
Agricultural University ...	2,495	...	...	3,500	...	...	40	...	...	268	...	...	350	...	...	31	...	...
Total ...	23,726	...	...	39,000	...	...	64	...	...	1,403	...	...	2,453	...	...	75	...	...

14.1.9 Female Education

Investment in the education of women provides a wide range of private and social benefits. Their contribution towards rearing of children and management of household economy is significant. The level of schooling of women determines the efficiency of household management. Educated women pay greater attention to nutrition, health and childcare than the uneducated one. Further higher schooling of women offers substantial social benefits in respect of (a) the quality of educational and social preparation provided to the children, (b) the willingness as well as the necessity to raise the age of marriage of girls[1] (c) the ability of women to comprehend and accept family planning techniques, (d) the upliftment of the status of women, and (e) the competence of women to perform productive functions outside their homes. An effective participation of women in the development of the country can be ensured only by putting them to suitable productive work. Women of our society must acquire a sense of equality with men which can be promoted by providing equal opportunities, including that of education to men and women alike.

While the women in our country constitute half the nation's total population, the incidence of their illiteracy is much higher than that of the male population. The percentage of female students in the total student population is extremely low (28·5) at different levels and stages of education. At the primary stage, out of 60·00 lakh students, only 20·00 lakh (33 per cent) are girls. At the secondary level, the number of girl students is only 2·72 lakh (16 per cent) out of a total of 17·00 lakh. At the higher education level the percentage of female students is not more than 8. Social motivation for participation of girls in education is extremely poor and the rate of drop-out is alarmingly high. No programme for universal primary education during the First Five Year Plan and lower secondary education by the Second Five Year Plan will be possible unless the retention of girls in the educational institutions is increased substantially through incentives and motivations. In the First Five Year Plan, maximum priority has been accorded to female education at all levels.

The following measures are suggested to encourage increased participation of women in education :

(i) All the primary schools will be gradually staffed with female teachers with requisite qualifications and training. Initially, however, female teachers with lower educational qualifications may be appointed to teach in the lower classes.

(ii) Educated village women will be persuaded and induced to teach on a part-time basis those girls who would not go for formal education in schools. Instructions in such informal classes will mainly be on the three R's and the common house-

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Note 1 : In the rural areas of Bangladesh the peasants want to marry off their daughters soon after they attain puberty. This can be discouraged if the girls attend schools and thereby keep themselves engaged for some length of time even after attaining puberty. This will automatically shorten their effective reproductive age and thus curtail the number of births, having a direct impact on the growth of population.

hold skills, such as sewing, embroidery, cooking, food preservation, etc. Syllabi for such instructions will be framed by a committee under the aegis of the Bangladesh Academy for Rural Development (BARD). Management of this education will be the responsibility of the local government bodies.

(iii) Women should not necessarily confine themselves within home management subjects; they will also be welcome in science, commerce, vocational and technical subjects. Their active participation in these fields will definitely add to the economy of the country.

(iv) Co-operation of women's organisations, urban and rural community development organisations and other social humanitarian workers would be sought to accelerate female education in the country.

14.1.10 Non-Formal Education

A. *Introduction*

Non-formal education refers to any organised learning activity outside the graded, age-specific and certificate-oriented formal system. A non-formal programme offers a diversity of learning activity prepared to meet a diverse clientele with different objectives and at all ages. It may take various forms such as literacy programme for adults and youths, health education, nutrition and family planning programmes, occupational skill training for youths and adults, youth clubs with sustained educational activities. It is designed to complement, follow up and/or substitute the formal instructional programme. Another feature is that it is usually inexpensive and based on local initiative.

Interest in non-formal education has been generated mainly from the recognition that the formal educational system, however strong and adequately financed, would be eventually incapable of meeting the total demands for education and would cover a limited part of the learning system, while non-formal education will be intensified to meet the gap in the education process as a whole. Despite lack of coherent and well organised programme, non-formal education is attracting increasing attention of the developing countries. Non-conventional educational programmes are being organised mostly for farmers' training, agricultural extension, training of entrepreneurs, rural artisans and craftsmen. These include multi-purpose programmes for out-of-school youths and educational activities for family and community lives.

There are various modes of non-formal education. Two essential components of non-formal education are (i) the programme has been planned to fit the unique need, characteristic and interest of the locality, and (ii) the programme has been planned by local people in contrast to the formal system where the responsibility of planning and execution rests primarily on the central authority. Adaptability, variety and creativity are the main criteria of non-formal education. Non-formal education may be supported by various ministries and departments. In addition, grants from local bodies, private organisations, volunteer agencies, individuals and earning from services and products produced by trainees, etc. can be used for supporting non-formal education.

In Bangladesh, non-formal education is now in its infancy but can play a bigger role in view of the inadequacy of the existing institutions and the high costs of running a conventional school system. During the Plan we envisage that 73 per cent of the children of the primary age-group, 24 per cent of the secondary age-group and about 0·1 per cent of the adults will be undertaking instruction in the formal system. If the remaining are to receive any education or training at all this can only be imparted through a well-organised non-formal system.

Non-formal education in order to be successful should be planned at the local level and the steps involved in such planning are to : (i) diagnose the socio-economic context, (ii) identify priorities, (iii) define objectives for each programme, (iv) determine the impact, advantages, cost and disadvantages of such training programme, (v) identify the clientele, and the training group, (vi) design the training in relation to the existing educational and developmental activities and (vii) use in most cases the training facilities available in the locality. To assist such local level planning, a committee for non-formal education comprising representatives from the Ministries of Planning, Education, Rural Development and Co-operatives and Local Government will be set up under the auspices of the Bangladesh Academy for Rural Development. This committee will identify priorities at regional level and will determine the mechanism for such education. The Integrated Rural Development Programme (IRDP) would be the vehicle of non-formal education.

The thrust for non-formal educational activities would be in three directions:

(i) Provision of skills to out-of-school youths and adults; this has been elaborated in connection with the programmes of secondary and vocational education;

(ii) Spread of mass education and functional literacy; and

(iii) Education related to development needs through the extensive use of educational technology.

B. *Functional Literacy*

The major component of an adult literacy programme is functional literacy which should be consistent with our priorities and production needs. Although contribution of functional literacy to production and growth has been proven, yet no uniform method, structure or technique to educate the masses has been evolved. Different countries are experimenting with different methods and even within a single country various methods are being tried. In Bangladesh several experimental projects are being carried on in the districts of Sylhet, Comilla, Chittagong and Rajshahi. In fact, a successful programme of mass education requires diverse form and content to suit the needs of different age-groups, sex, interest, employment and region.

Techniques for implementing mass education programmes vary. Teaching methods require adaptation to meet the psychology and habits of the adults accustomed to different ways of life and employment. Techniques for creating motivation are dependent on qualified teachers, volunteers, non-conventional means of communication and use of educational technologies like radio, television and newspapers. Local participation and generation of local leadership are dependent on the existence and functioning of the local government institutions, co-operatives, trade unions, local societies, industrial firms, youth workers, women organisations, religious

associations, voluntary agencies and local education authorities. The focus also varies with the eed and availability of finance. Usually, priorities are adjusted in favour of an age-group that is engaged or about to be engaged in production.

The organisation of functional literacy for attaining mass education is a stupendous task. Most of the developing countries which have undertaken such programmes have not always succeeded in translating the objectives into meaningful operational programmes. Many of them have tried to teach the adults in the same manner as the children, which is obviously unworkable. The task requires imaginative planning, coordination and participation by all development agencies functioning at the grass-root level. In most of the countries such programmes are undertaken by the Ministry of Education in cooperation with other agencies, while in some countries Ministries dealing with rural institutions carry on such programmes. In our country, such programmes, to be successful, should be developed jointly by the Ministries of Education and Rural Development. Utmost attention will be paid to the spread of mass education during the Plan and necessary funds will be provided to achieve the targets.

C. *Educational Technology*

Educational technology is a systematic process to use personnel, materials and equipment to disseminate knowledge. In Bangladesh, the concept so far has been limited to the provision and use of audio-visual aids, films, charts and text books. The use of educational technology in a wider sense, with radio, television and newspaper, has not been successfully explored.

The communication media specially radio and television while used as an integral part of the education and training system, is most effective in introduction of new curricula, improvement of the teaching ability of teachers and in most efficient use of the limited stock of able teachers. The concept can be more meaningfully applied in Bangladesh where trained and educated teachers are short in supply, curricula are ill-adapted to life, equipment is lacking, teaching aids are rare, contemporary teaching methods are unknown, most of the adults are illiterate, drop-out rate is high, quality of instruction is poor and teacher-pupil ratio is low. It is difficult to increase teacher training facilities due to lack of required manpower and financial resources. Further retraining of the entire teaching force is costly, it dislocates normal functioning of the schools and offers no guarantee that newly acquired knowledge would be applied during teaching. To meet such constraints instructional television and radio offer the best possible advantage. However,it is necessary that the best teachers are used for such instruction, maximum students are reached and teachers are retrained simultaneously with the education of students.

Television is usually expensive but in our country, the density of population offers a rare opportunity for the use of television for instructional purposes. Since plans are being made to cover the whole of Bangladesh by the television network, the instructional television requires extra funding only for preparation of educational programmes and for distribution of television sets. The cost of such a programme would be less than five paisa per-pupil-day now and would be even less than 0·20 per cent of the total development expenditure on education, when the entire net-work is completed. It will also enhance the efficiency of the instructional system and economize on the cost of training of teachers and production of text books.

The communication media would also provide extensive programmes for population education, family planning, health, sanitation and agricultural extension.

D. *Programmes*

The following programmes will be undertaken during the Plan for non-formal education :

(i) "People's Schools" would operate in each district during vacations and slack seasons to impart useful skills to the youths and adults of the rural areas of Bangladesh. Physical facilities already exist in some rural areas, e. g. in sugar mills, Government farms, experimental research centres, ADC farms and workshops, etc., which are not utilised throughout the year. These facilities will be used during slack periods for imparting training in crop technology, accounting, farm mechanics and processing of farms products, etc. The training content and the mechanism of training will be determined in consultation with local governments and the relevant agencies. The same committee on non-formal education referred to earlier will be responsible for organising the programmes.

(ii) "Youth Camps" will be organised in the rural areas in appropriate seasons for the students and other young people to enable them to take part in the local development efforts through manual work.

(iii) "Literacy Schools" will be established, and these will be attached to the 500 colleges now functioning within Bangladesh. The "schools" will be the centres of community service to be rendered by the college students, and teaching in such schools will form a regular component of their academic programme.

(iv) "Women's Education Centres" will be set up for imparting education in family planning, farm and home management and other related matters to the rural women.

(v) The existing "Youth and Cultural Centres" will be given increasing support.

(vi) "Feeder Schools" will be established and given due encouragement.

(vii) "Non-formal Vocational Training Centres" will be established by the industries. Some industries in Bangladesh have already adopted the programme, while some others have expressed considerable interest in it. The training effort will be concentrated in major industrial regions and in rural areas covered by IRDP. They will provide training to the workers and technicians for the textiles, agro-business, electrical, mechanical, building, automobile and oil industries, and the trainees will be drawn mostly from out-of-school-youth.

(viii) "Workers' Schools" will be organised by the mills, the factories, and the industries.

(ix) Radio and television broadcasting will be adopted as a basic teaching tool, and in co-ordination with text books and printed materials it will be widely used to impart knowledge through both formal and non-formal system.

A sum of Taka 40·00 crore comprising 10·42 per cent of the Plan allocation has been earmarked for meeting the expenditures under non-formal programmes (Table XIV-2). Since non-formal education is expected to be organised and implemented mostly by the local authorities and the private sector, the contribution from the participating community has been estimated at 50 per cent of the costs.

14.1.11 Other Educational Activities

A. *Physical Education and Sports*

Physical education is an essential element for the development of health, team spirit and leadership qualities of an individual. Facilities for such programmes in our educational system are not properly organised and need strengthening. During the Plan, emphasis would be given on the development of indigenous and traditional sports and games. Coaching centres will also be created for national games and sports.

A sum of Taka 5·00 crore has been earmarked (Table XIV-2) for development of sports, recreation and physical education in the country and to strengthen the activities of the National Sports Control Board for men and women.

B. *Library*

Development of library facilities will form an important component of our education programmes. Efficient library service will be designed to supplement all stages and levels of education. Library facilities are at present grossly inadequate and ill organised. The reading habits among the members of the public including students are declining due to the non-availability of books and periodicals in sufficient numbers. New programmes will ensure reorganisation and remodelling of the existing libraries and setting up of new ones in areas where such facilities are needed. School and college libraries will be improved. Mobile libraries will be introduced on an experimental basis. A sum of Taka 2·50 crore has been allocated for development of libraries and library education. (Table XIV-2).

C. *Culture and Heritage*

To preserve and develop our culture and heritage, institutions like Bangla Academy, Museums, Art Galleries, etc. would be developed. Private efforts for the promotion of arts and culture would also be supported to supplement Government efforts in these fields. A National Institute of Performing Arts will be established to sustain, foster, and develop our traditional culture and heritage specially in fine arts, music and dance. The programme of the College of Fine Arts also will be strengthened.

A sum of Taka 7·50 crore has been provided (Table XIV-2) for cutural activities including an allocation of Taka 1·50 crore for the Institute of Performing Arts.

14.1.12 Scholarships

A comprehensive and properly organised system of scholarships is likely to go a long way towards identifying talents and channelling them towards most desired fields. It is imperative to see that the real talents are not denied opportunities for further education only because they are not able to pay for it. So long as the State is unable to provide free or inexpensive education for all, it should try to bear necessary educational expenditure for those who are most deserving of it and who will be able to contribute most to the development of the nation. It is through such a system of scholarships that we can make the most meaningful equalization of educational opportunities.

The programme for award of scholarships will be based on merit and will be expanded to meet the increasing demand for science and technology needed for the country's future development. Efforts will be made to evolve a more reliable criteria and technique for identifying genuine talents through the reform of the examination and evaluation system. The rates and coverage of the awards would be appraised. Due emphasis would be given for scholarships on research at higher level of education. To provide additional incentives to female education, certain number of scholarships would be reserved for them. A programme for training abroad of the teachers, instructors, administrators and planners will also be accommodated within the Plan provision.

A programme of loan-scholarship particularly at the higher level of education may also be experimented. The main features of the programme would be as follows:

(i) The system will be supplementary to outright scholarships. This is likely to lessen the financial burden of talented students during their study and it would also economise the state contribution. The repayment of the loan would begin after the incumbents get into jobs and begin earning.

(ii) In the initial stage the programme will be kept confined to the students of science and professional courses where the chances of employment and levels of earnings are comparatively better.

The programme is expected to prevent wasteful expenditure on the part of the students and it would help build up character and sense of responsibility in them.

The scholarship programme will cover about 2,50,000 students from all stages, levels and forms of education during the Plan. A sum of Taka 19·00 crore has been allocated in the Plan for this purpose (Table XIV-2).

14.1.13 Educational Planning and Management

In our country planning and management within the educational institutions is weak. As a consequence unplanned educational expenditures intensify the strain on the limited financial resources. Efficiency in the management of the institutions is extremely poor, mainly due to lack of training of the administrators (principals, headmasters, development officers) in financial management and institutional planning. Unless a concerted effort is made to increase the efficiency of the administrators in this regard, an enormous wastage in financial and manpower resources will take place during the First Five Year Plan and thereafter.

At present, Bangladesh has 40,000 educational institutions including about 6,000 secondary schools, 500 colleges and 70 technical and vocational institutions, catering to 80,00,000 students. Around 85 per cent of these institutions are privately managed, although about 25 per cent of their expenditures are borne by the Government in the form of grants. While expenditures on these institutions consume a great portion of the resources available to the Government, the poor efficiency of the institutions coupled with large student enrolment and inadequate utilisation of the available physical facilities will be a handicap to future development efforts.

The Government is at present considering decentralisation of the administration by transferring a major segment of the governmental responsibilities to the regional authorities. Education is also expected to be decentralised under this programme. Therefore, the educational

administration and planning which are now centralised in order to be effective should move to the administrative zones. To assist the concept of grass-root planning a large number of able educational administrators and planners will be required. To build these personnel, effective steps are imperative.

During the Plan, an Academy for Planning and Management of Education would be established, attached to the Ministry of Planning with an allocation of Tk. 2·00 crore. The Academy will convey to the administrators concepts of management and planning in relation to their particular institutions through in-service course which will effect qualitative improvement of the institutions and will increase their efficiency. The proposed Academy would also train officers connected with education development at various levels and would arrange seminars for senior educationists and officials of the Ministry of Education and of the Universities. Since the institution would be training a large number of people of various levels, it should be manned by competent and senior personnel and headed either by a university professor or by a government official not below the rank of a Secretary. To assist this programme, International Planning Bodies like UNESCO, and International Institute for Educational Planning may offer capital and technical assistance.

The Plan envisages a number of ways and mechanisms to ensure effective utilisation of existing physical facilities and to increase the efficiency of the system. The measures would reduce the cost of construction and would divert the savings for qualitative improvement. The innovative programmes such as (a) organisation of in-service teacher training programme during vacations at secondary schools and colleges, (b) use of primary school facilities for middle level education, (c) use of facilities of the technical and vocational institutes for diversified education imparted at secondary level, (d) provision of central laboratories and community workshops, would require grass-root planning and effective co-ordination among the various ministries, directorates and institutions. To ensure optimum utilisation of all educational facilities available within the region, a co-ordination authority for education may be created to work out such method of co-ordination in consultation with the regional education authorities.

In a developing country like ours, the chief components of any educational development programme comprise buildings and equipment *i. e.* investment on bricks, mortars and machineries. Materials required for such programme are usually expensive and mostly imported. Nearly, two-thirds of the development budget are accounted for this. However, a well planned programme for efficient construction provides substantial contribution towards congenial atmosphere and functional utility of the educational institutions.

In some educational system, special cells have been created to prepare and execute programme for planned adoption of uniform designs, norms and scheduling of premises in respect of class-rooms, laboratories and workshops. The task of the School Building Cell comprising of architects, engineers, economists and educationists, is to prepare an investment frame to provide an adequate but planned programme for net investment in school buildings. The cell examines various aspects of the construction programme,

(a) to effect the most optimum and functional use of the existing space;

(b) to determine more intensive use of class-rooms and laboratories for technical and scientific instructions;

(c) to identify the unused capacity of the existing stock of space; and

(d) to predict the technical change or measures which may increase the efficiency of the resources now being used.

Dependent on such analysis, the cell advises the educational authorities on siting and physical planning of the schools, procurement of land, labour, school size, location, costing, and equipment. They also prepare appropriate design for the institutions.

The School Building Cell where functional, has achieved substantial savings on investment costs which has been diverted for qualitative improvement of instructions in the educational system. It is proposed that such a policy and planning cell for school building should be functional in our country during the Plan. The Directorate of Public Instructions has already a small wing to advise on engineering and reconstruction programme. It is proposed that the scope of the wing be broadened and strengthened so that it may undertake the responsibility and functions mentioned in preceding paragraphs.

14.1.14 Social Science Research Council (S.S.R.C.)

A. *Introduction*

Bangladesh is passing through a phase of rapid socio-economic change. There are challenging socio-economic problems like population explosion, unemployment, poverty and exploitation, rural development, labour participation in the management of enterprises, and many others which call for long range studies requiring a multi-disciplinary approach. Research into the social and economic problems is needed for formulation of appropriate and effective strategies for social action, and for development plans to be realistic, scientific and capable of full realisation.

Unfortunately, the present state of research activities in the socio-economic problems of Bangladesh is very unsatisfactory. There are very few institutions or individual scholars engaged in research programmes. The universities emphasize teaching and the little research done therein is, generally, discipline-based. Problem-oriented research is even more neglected. Communication between researchers and the 'users' of research results is very loose. One reason for this state of affairs is that there is no central institution to promote social research, to provide channels for communication between researchers and 'users', and to give financial and technical support to research institutions and individual research workers.

It is important that social scientists deal with real issues and get involved in problem-solving works. Significant research contributions have to go beyond the boundaries established by individual disciplines. Inter-disciplinary research is difficult to organise by *ad-hoc* committees or institutions specialised in a particular area. Often research on relevant social, economic and political problems is not undertaken because there does not exist an infra-structure to encourage such research. It is felt that a social science research council will help to meet this need for such infra-structure.

B. *Objectives*

The objectives of SSRC of Bangladesh will be :

(i) to promote research in social sciences, particularly in problem-oriented and action-oriented fields;

(ii) to facilitate utilization of research in formulating plans, policies and programmes of national, regional and community development;

(iii) to promote better understanding between social scientists and decision-makers; and

(iv) to promote communication and co-ordination between different social scientists in different institutions.

C. *Functions*

The functions of the Council (which will be incorporated in its Memorandum of Association) will be:

(i) to review the progress of social science research, and to identify gaps and priority areas;

(ii) to sponsor social science research progammes and projects, administer grants to institutions, centres and individuals, to give financial support to professional associations and to encourage publication of professional journals;

(iii) to provide help in designing multi-disciplinary projects;

(iv) to arrange for training in research methodology;

(v) to develop a documentation and dissemination centre;

(vi) to administer fellowships in Bangladesh, foreign fellowships and international relations in connection with social sciences; and

(vii) to advise the government, as requested, on any matter related to promotion of social science research and its utilisation.

The following social sciences will be recognised for the purpose of research grants and fellowships:

(i) Economics, including Agricultural Economics;

(ii) Management, including Commerce, Business Administration and Public Administration;

(iii) Political Science, including International Relations;

(iv) Sociology, including Rural Sociology, Social Work and Communication;

(v) Anthropology;

(vi) Psychology, including Social Psychology;

(vii) Geography, including Human, Political and Economic Geography; and

(viii) Demography.

D. *Organisation*

The SSRC will be an autonomous organisation attached to the Ministry of Education. The autonomy of the Council is of profound significance. This involves freedom from political and bureaucratic pressures. It is, therefore, suggested that the SSRC should enjoy the same kind of autonomy as the universities.

There will be a Board of Governors of SSRC consisting of 8—10 members. About two-thirds of the members will be social scientists, and the rest from government and other 'user' agencies. The members of Board of Governors and the chairman will be appointed by the Government.

The SSRC will nominate outstanding social science researchers as honorary fellows. The chairman and the social scientist members of the Board will be selected from honorary fellows of the SSRC. The SSRC will have a full-time Member-Secretary as the Chief Executive and three Directors in-charge of three divisions performing the following functions :

(i) administer the research grants, fellowships, organise surveys and identify priorities through committees which are discipline based as well as multi-disciplinary ;

(ii) develop and maintain a documentation and dissemination centre ; publish reports and news-letters ; and

(iii) Initiate and manage inter-disciplinary projects ; provide necessary help and monitor progress of such projects ; organise or help organising seminars, workshops, methodological training courses, etc.

F. *Finance*

The SSRC will be financed from a government grant amounting to Tk. 2·00 crore for five years (1973-74 to 1977-78) provided under the First Five Year Plan.

14.1.15. Bangladesh Institute of Development Economics

The Bangladesh Institute of Development Economics (BIDE) is an autonomous research-*cum*-training organisation with the functions of conducting empirical policy-oriented research on problems of Bangladesh development and providing specialised training in applied economics. It is the only organisation of its kind in Bangladesh. Much research and thinking will be needed for designing effective socio-economic policies in order to fulfil the new nation's objective of planned development. The BIDE with its experience in research on economic policies should serve as the focal point of high level professional work on development problems and provide the basic research and thinking behind planning in the country with an autonomous status.

There are considerable needs for training in economics for many officials in various Government Ministries and agencies to improve their understanding of socio-economic planning problems and their capacity of formulation and appraisal of projects so that role of planning and the importance of efficient management, co-ordinated implementation and evaluation are fully appreciated at various levels of employment. The BIDE has the necessary potential and is eminently suited to perform this specialised training function through problem-oriented and inter-disciplinary courses.

The Institute, therefore, requires expansion of facilities in research and training, with high priority to studies on agriculture, population and employment. Application of several disciplines is required for satisfactory study and analysis of the multi-dimensional problems of development. Its expansion will include creation of special facilities for development of population research and staff training with the capability of providing technical advice to the development agencies.

To enable the BIDE to perform these expanded activities, it will be reorganised as a statutory organisation, and be provided with a grant of Taka 2·50 crore for the First Plan period.

14.1.16. Development of the Statistical System

The need for accurate and reliable statistics can hardly be over-emphasised. There is almost universal complaint that available statistics of the country are poor and inadequate for planning, research and decision-making. The Bangladesh Bureau of Statistics (BBS) or the Bureau

of Agricultural Statistics (BAS) cannot cater for all the statistical needs of a sovereign developing nation without a major reorganisation of the statistical system of Bangladesh where as many as 18 agencies collect and compile data in a highly decentralised and uncoordinated manner. Statistics are now poor because the present weak statistical services are engaged in the collection of statistics which are often compilations of whatever reports can be obtained, rather than being the product of research and estimation of totals and averages. Most of these agencies are not properly staffed and equipped to produce adequate and quality statistics. The meagre resources are also spread thinly because of the high degree of decentralisation.

The Government is determined to improve the statistical system and bring it to the required efficiency. It aims at developing various statistical series following the priorities as determined by the needs of planning and policy making, and creating an organisational structure capable of undertaking these functions. Higher priorities would be given to the development of macro-aggregates such as national income accounts and employment. Also substantial improvement will be made to the statistics on prices, foreign trade, agricultural and industrial production, and selected demographic and social statistics. Simultaneously, sample survey operations, computerized statistical information and reproduction activities shall be greatly strengthened.

To perform all these satisfactorily and with due authority, the level of the proposed national statistical organisation is proposed to be raised to that of a Division of the Government, and the major statistical agencies now functioning in the various Ministries are also proposed to be transferred and integrated to this reorganised national statistical organisation. Positions for a few high level professionals will have to be established in the reorganised statistical organisation to discharge its functions efficiently. In addition, to train up the existing and newly recruited personnel technical assistance from various foreign sources is being tapped.

A high powered National Statistical Council headed by the Deputy Chairman, Planning Commission is required to be set up to co-ordinate the collection of statistics and lay down broad guidelines for the statistical system. High level representatives of the economic ministries, other users and producing agencies and professional bodies will be associated with it. Furthermore, suitable and comprehensive legislation will be proposed in due course ensuring compliance with the request for statistical information and safeguarding the respondents from any abuse of the information supplied by them.

An amount of Taka 3·00 crore has been earmarked for this programme which will be drawn from the allocation of the Government sector during the Plan.

14. 1. 17. Development of Public Administration

The quality of administration and management in the country is directly related to and dependent on the efficiency of the administrative personnel. The skills and motivation of the civil servants should, therefore, be improved through introduction of functional and fully co-ordinated training programmes that would meet the overall training needs of all person-

nel of various sectors at appropriate stages of their career covering all grades. The Government has recently set up a Civil Servants' Training Academy to co-ordinate the existing training facilities for the civil servants.

Problems connected with the recruitment and training of civil servants have been duly considered by the Services Reorganisation Committee. Appropriate policies will be formulated by the Government on the basis of their recommendations. It is highly desirable that a civil servant should receive training at least in three phases of his career, at pre-entry, mid-career and policy levels. The transformation of the country to a socialist pattern can be hastened by a band of dedicated and motivated civil servants. A series of crash training programmes can be organised as interim arrangements for all the existing civil servants and for all senior employees of the nationalised industries. The proposed training programme of the civil servants should be intensive and take various forms like seminars, syndicates, courses, discussions, tours and so on.

Since liberation, the Government has been trying to re-define the role of the civil servants with a view to achieving efficient administration. Many in-service training facilities have also been created. Satisfactory set-up for imparting training at the pre-entry level, however, have yet to be organised. The existing Gazetted Officers' Training Academy (GOTA) used to impart training to the former East Pakistan Civil Service probationers, but its facilities have been inadequate to meet the requirments on national basis. Since 1961, the National Institute of Public Administration (NIPA) has been carrying on mid-career in-service training. Its present capacity in terms of man-days of training is only about 5,000. There is no institution for training the senior administrators and management personnel. The staff Training Institute for the secretarial-workers has come into existence only recently. It has no permanent facility in terms of personnel, building and equipment. The BARD has been providing training and orientation courses to officers in some areas to meet specific needs. Its facilities for training are also not adequate. The existing facilities for public administration training at different levels in Bangladesh may be stretched to a maximum of 15,000 man-days of training which compared to total requirement of administrative training in the country appear to be far inadequate.

In the absence of realistic data, it is difficult to estimate the actual quantum of training required for the civil servants in Bangladesh over the next 15 years. It is proposed that a national training council should be instituted which will be able to provide a machinery to undertake a realistic and systematic assessment of the total training needs of the country and prepare annual and five year manpower budgets. However, one rough exercise indicates that about 91 per cent of the civil servants have not undergone any training either within the country or abroad.

If all the three phases of training envisaged earlier are implemented, then the quantitative dimension of total training needs in public administration would be more than 250,000 man-days within the Plan period. Obviously, organisation of such a large scale programme within the Plan period will be difficult for various reasons. It is proposed that during the Plan about 70,000 man-days of formal training would be offered covering the various categories of officials and employees.

The following programmes will be undertaken during the Plan under the public administration sub-sector :

(i) A national training council at the highest level would be instituted. The Council will (a) lay down policies on training, (b) design, coordinate and implement a comprehensive training programme, (c) prepare the annual and five-year manpower budgets, (d) determine the training needs within the country and abroad over the time horizon, (e) determine training contents and the curriculum, (f) evaluate and coordinate the activities of all training institutions and design their training load, and (g) follow up the efficiency and performance of the participants. The Council would also take care of research in public administration and education and would suggest measures for providing consultancy services to the institutions ;

(ii) Crash programmes would be designed for the orientation of the senior officials ;

(iii) An Academy for Administration would be set up to impart training at the pre-entry level ; the duration of the training will not be less than 18 months and would be supplemented by BIDE, BARD and the Universities ;

(iv) An Administrative Staff College would be instituted to offer advanced training to the senior officials covering policy issues and matters of administration ;

(v) The programme of the newly instituted Civil Servants' Training Academy would be related to the programme of NIPA, GOTA and STI by adequate administrative arrangements ; and

(vi) The NIPA would be equipped with sufficient facilities to offer mid-career training. The existing Staff Training Institute would be reasonably strengthened. Some peripatetic centres would be introduced to support the staff development programme of the Government.

An amount of Taka 7·00 crore has been provided for development of public administration, training and education under the on-going programmes. The funds have been indicated under the allocation of the Government Sector.

14.1.18. Educational Films

The functional dimension of the existing film unit would be widened to meet the aspirations of an emerging nation. The unit, besides producing publicity film, will prepare films for educational uses. These would be shown in the schools and colleges, in the cinema houses and at times over television, in an effort to minimise the deficiencies in our educational standards, and to widen the doors of perception of the young. The educational film unit will assist the programme for adult literacy, mass education and non-formal education. A sum of Taka 50·00 lakh has been earmarked for the film unit during the Plan period which would be drawn from the allocation of the Government Sector.

14· 2. LABOUR WELFARE AND TRAINING

A. *Introduction*

Labour welfare is a form of social investment with high return in terms of social and economic benefits. Prior to liberation, little importance was attached to labour welfare in this country. Only about Taka 6·00 crore was spent for labour welfare during the last 25 years and only the following facilities were created :

(a) 5 Technical Training Centres with an annual enrolment capacity of 1,400 students ;
(b) 1 Industrial Relations Institute with an annual enrolment capacity of 90 ;
(c) 18 Labour Welfare Centres with inadequate medical and recreational facilities ;
(d) 5 Employment Exchanges ;
(e) 4 Vocational Guidance and Youth Employment Units which are professionally ill-equipped to perform the job ; and
(f) 1 Planning and Statistical Cell which is completely inadequate in size and strength.

At present, 5 Employment Exchanges are functioning. They are supposed to render free and impartial services to the unemployed, underemployed and the employers. But the impact of the Employment Exchanges on the labour market has not so far been encouraging. Neither the registration system in the Employment Exchanges nor the responses from the employers for employing the registered unemployeds were satisfactory. It is necessary to reappraise the role of the existing employment exchanges in terms of new realities of Bangladesh. This should also allow us a realistic evaluation of the utility and viability of these institutions under a socialist pattern of economy. In the light of the reappraisal, the function of the employment exchanges should be redesigned and these should be given necessary support if required for staff training and ancilliary facilities. Further, the question of entrusting the employment exchanges with the tasks of recruitment in the public sectors that are now outside the jurisdiction of the two Public Service Commissions should be examined.

The responsibility of training of skilled workers lies with two Ministries of the Government, *i. e.*, Ministry of Education and Ministry of Labour. However, it is observed that the standards of training and the course contents among the ministries and among the institutes within the ministries vary considerably. They are not often tuned to the requirements of the industry. Further, in the absence of proper coordination mechanism between the two Ministries, sometimes the same courses under two Ministries are called differently and same nomenclature is used for different courses. Most of the trainees undertake jobs that have no relevance to their training. The Government has entrusted the Board of Technical Education with the responsibilities to ensure uniformity in standards of teaching, management and examination in all stages of technical education. But they have no jurisdiction over the training institutions that are now under the control of the Ministry of Labour. In order to attain uniformity in standards, all the technical training institutions and centres in Bangladesh should be brought under the purview and control of the Board of Technical Education.

Most of the industrial workers have migrated from a rural environment and their concentration in unfamiliar industrial zones has given rise to various social and economic problems and maladjustments. The problems are mostly related to housing, sanitation and health. The housing facilities provided by the industrial concerns have proved inadequate to the actual needs and are often not satisfactory for congenial living. Health facilities have

also been meagre. During the plan period extensive workers' welfare measures would be undertaken to remedy and rectify the shortcomings.

B. *Objectives*

The objectives of the First Five Year Plan will be as follows :

(a) Extension of facilities for skill development both through formal training institutes and regular apprenticeship training programme ;
(b) Educating the workers, leaders and management about their respective rights and obligations ;
(c) Expanding labour welfare measures through better housing, sanitation, medical and recreational facilities ; and
(d) Improvement of facilities for research and statistics.

C. *Programmes*

The Programmes for labour administration and welfare are as follows :

(1) Workers' Hospitals will be established in 5 industrial zones ;
(2) Low-cost housing would be provided for two industrial zones on an experimental basis ;
(3) Twenty Labour Welfare Centres would be introduced in major industrial establishments to provide health and recreational facilities and to encourage "consumers' cooperatives" ;
(4) Six technical training centres, now under construction, would be completed ;
(5) Efficiency of the existing apprenticeship training programme would be improved and on-the-job training would supplement the training programme envisaged by the technical training institutions ;
(6) The "community workshops" and the vocational institutions would arrange periodically courses to upgrade and strengthen the skills of the self-employed artisans ;
(7) "Workers School" would be supported in each industrial unit which should be organised on a voluntary basis ;
(8) Sports and recreational facilities would be made available in all industrial establishments ;
(9) Industrial Relations Institutes would be established in major industrial towns (Chittagong, Khulna and Rajshahi) to assist, organise and strengthen the trade unions ;
(10) A statistics and planning cell would be created in the Ministry of Labour ;
(11) The programme of the Management Development Centre would be coordinated and adjusted to the overall programme of the proposed Civil Servants' Training Academy and would be geared to the needs of socialist management ;
(12) As a step towards comprehensive social security measures, provision for "Accident insurance while on duty" would be made on a restricted basis in some industrial areas ;
(13) The programme of the 5 Employment Exchanges would be consolidated.

Development of Labour Welfare and Training has been sufficiently stressed during the First Plan period and an amount of about Taka 27·70 crores has been allocated for the same. The provision will take care of both on-going and new approved schemes.

TABLE XIV-9

LABOUR WELFARE AND TRAINING: FINANCIAL ALLOCATION AND BREAKDOWN OF COSTS BY SUB-SECTORS

(In Lakh Taka)

Sub-Sectors	Total	Percentage of Allocation
1. **Workers' Hospitals (5)**	10,00·00	36·10
Construction	5,00·00	
Equipment	5,00·00	
2. **Housing (in 2 Industrial zones)**	5,00·00	18·05
3. **Technical Training Centres (11)**	3,80·00	13·72
Construction	2,00·00	
Equipment	1,50·00	
Books	30·00	
4. **Labour Welfare Centres (20)**	2,00·00	7·22
Construction	1,20·00	
Equipment and books	80·00	
5. **Management Education**	60·00	2·17
6. **Conciliation Machinery**	25·50	0·90
7. **Industrial Relations Institutes (3)**	1,50·00	5·41
Construction	1,00·00	
Books & Equipment	50·00	
8. **Research**	50·00	1·81
9. **Provision for Accidental Insurance**	1,54·30	5·57
10. **Consolidation of Employment Exchanges**	50·00	1·81
11. **Self-employment (Grants)**	50·00	1·81
12. **Workers' Schools**	50·00	1·81
13. **Sports and Recreational facilities**	50·00	1·81
14. **Upgrading of self-employed artisans**	50·00	1·81
Total ...	27,69·80	100·00

CHAPTER XV

HEALTH AND SOCIAL WELFARE

15.1 HEALTH

15.1.1 Introduction

The existing health facilities in Bangladesh are inadequate both in quality and quantity. To make the situation worse whatever little we have is so badly distributed that the services are enjoyed by only a privileged few. This is contrary to all concepts of social justice and must be corrected. The health facilities and services in Bangladesh should be provided in such a way that the benefits of existing facilities and future development programmes reach the common man. Since the vast majority of the population in our country lives in the rural areas, we should strive to build our Health Services throughout the country, so that in the not too distant future, it becomes possible to provide reasonable health care to all.

We are handicapped due to lack of both resources and manpower. In the beginning, therefore, we must adopt a strategy of action which would involve comparatively small expenditure of resources and less demand on highly trained personnel to build up a health service which will cut down preventable morbidity to the minimum and provide moderately satisfactory medical care to the sick. Since most of the morbidity and mortality in our country is due to preventable diseases our health programme has to be preventive-biased. This bias is all the more necessary for economic reasons because per capita expenditure for effective preventive programmes is much less than that for curative programmes specially in case of most of the communicable diseases which are the major causes of morbidity and mortality in our country, particularly in rural areas. Moreover, prevention of morbidity in the population has a definite economic gain, because it enhances quality and quantity of the work of the labour force. This, however, does not underestimate the necessity of curative programme as it deals with the care of the sick.

No Health programme can be completely successful in the absence of simultaneous and co-ordinated effort in the allied sectors, *e.g.*, environmental sanitation including potable water supply and hygienic night-soil disposal, food and agriculture, transport and communication, engineering and industry, education and social welfare, etc. If environmental sanitation is neglected all efforts to control the intestinal diseases will end in failure. A rural health centre without transport and communication facilities can not fully serve its purpose. A population without adequate food supply will continue to suffer from diseases due to malnutrition. Without planned development of pharmaceutical industry, dearth of drugs will hamper the treatment of the sick. It is, therefore, imperative that inter-sectoral co-ordination and co-operation must be given due importance.

15.1.2 Present Situation in the Health Sector

Unfortunately, statistical data for assessing the health conditions in the country are not readily obtainable due to absence of any organized system of collection of health data. However, whatever information is available from different sources (including some of the surveys) a broad picture of the health conditions can be depicted as follows:

It has been variously estimated that the crude birth rate is 47 per thousand while the death rate is 17 per thousand giving one of the highest growth rates of population in the world. In 1961, the infant death rate was estimated to be 160 per thousand live births with

a maternal mortality rate of 30 per thousand births. Recent estimates, however, indicate that the infant mortality rate has come down to 140 per thousand live births which is still extremely high compared to developed countries where it varies from 20-40 per thousand. The nutritional intake of our population is extremely poor. A recent UNROB survey shows that about 3·8 million children under 10 years of age are affected by moderate to severe malnutrition. According to various estimates more than 50 per cent of the population is suffering from protein caloric malnutrition, the most severe type occuring in the pre-school age children and child-bearing women. The diet is specifically lacking in vitamin A, and riboflavin throughout the country. In addition about one-third of the population is suffering from anaemia associated with worms infestation and by dietary deficiency. Over 64 per cent of the children suffer from intestinal infestation due to worms. The average haemoglobin contents is two-thirds that of Europe. This state of malnutrition makes the population easily vulnerable to infectious diseases.

Infectious disease is yet the most important reason for high morbidity and mortality. Malaria, Tuberculosis, Small-pox, Cholera and other diarrhoeal diseases, children diseases like Diphtheria, Tetanus neonatorum, Whooping cough, Measles, etc., are still taking large toll of life. There are about 1,00,000 deaths due to pulmonary tuberculosis annually. Prevalence of tuberculosis ranges from 2·6 per cent to 4·5 per cent in industrial workers according to a number of surveys. Contrary to popular view T.B. infection is more common in rural than in urban population. As for small-pox, from the middle of 1970 to the end of 1971 no case of small-pox was reported but since the eradication programme completely broke-down during the war of liberation fresh out-break of small-pox has been reported from almost all over the country. Several thousand cases were reported in the first 17 weeks after independence and the occurrence of small-pox still persists. Cholera is still endemic in the country. Although a very successful regimen for treatment of cholera has been discovered in the Cholera Research Laboratory at Dacca, dependable immunising agent is not yet available. The permanent measures for eradication are safe water supply and hygienic disposal of human excreta. This strongly indicates the need for vigorous action by the public health engineering unit of the Works Ministry. Malaria eradication programme so far has done a good job. Incidence of malaria has been reduced to a minimum level except in the border zones where collaborative activities on malaria eradication are being worked out with neighbouring countries to prevent import of infection.

The high death rate of 260 per 1,000 in children under 5 years of age is mostly due to diarrhoea, diphtheria, whooping cough, measles and other bacterial and viral infections superimposed on malnutrition.

The high maternal mortality rate of 30 per 1,000 births is due to virtual absence of maternity and child health services specially in rural areas. Puerperal infection due to unhygienic conditions after the delivery of babies superimposed on malnutrition is one of the major causes of this high rate of maternal mortality.

Health care so far has been urban-oriented and curative-biased. All physical facilities for health care were established in the urban areas neglecting the vast majority of the population in the rural areas. More recently a half-hearted attempt was made to extend health

care to rural population by creating 150 rural health centres. But these also were not properly manned or equipped to serve the rural people satisfactorily. Curative-biased health care is not suitable in Bangladesh at this point where the major health problem is nutritional and communicable diseases. At present there are 12,311 hospital beds of all categories (Table XV-1) of which 10,449 are in the public sector and 1,862 hospital beds are available in the private sector.

TABLE XV-1

Total Hospital Beds of all categories in Bangladesh as on June, 1973.

Category of Hospital Beds.	Number of beds.						
	Public Sector.			Private Sector.			Grand Total
	Urban.	Rural.	Total.	Urban.	Rural.	Total.	
1	2	3	4	5	6	7	8
1. General Beds:							
District Hospital ..	1,118	..	1,118	398	1,178	1,576	3,780
Subdivisional Hospital ..	1,086	..	1,086	..	..	..	
2. Teaching Hospital ..	3,670	..	3,670	..	..	..	3,670
3. Specialized Hospital :							
Tuberculosis and Chest Diseases	966	..	966				
Leprosy	60	..	60				
Infectious Diseases ..	180	..	180	..	..	..	1,606
Mental	400	..	400				
4. Maternity	235	900	1,135	286	..	286	1,421
5. Jail Hospital	860	..	860	..	..	..	860
6. Police Hospital	652	..	652	..	..	..	652
7. Railway Hospital	137	185	322	..	..	..	322
Total	9,364	1,085	10,449	684	1,178	1,862	12,311

All public sector beds are in urban areas except 900 maternity beds attached to the rural health centres and 185 beds in railway hospitals. General hospital beds abvailable to rural people have been provided by the private sector. As for specialized hospital beds, there are only 966 beds for tuberculosis, 60 beds for leprosy, 180 beds for infectious diseases and 400 beds for mental diseases throughout the country. The hospital bed population ratio is 1 bed per 6,250 population as compared to 1:100 in UK. It is also clear that hospital bed facilities have to be immediately created in the rural areas where practically no hospital facilities exist at present.

In spite of the fact that infant mortality rate is 140 per 1,000 live births and maternal mortality rate is 30 per 1,000 we have a very rudimentary maternity and child health service existing at present.

TABLE XV-2

Maternity and Child Health Centres (1972-73).

Location	Government		Private		Total	
	No. of Centres.	Beds.	No. of Centres.	Beds.	No. of Centres.	Beds.
Dacca Division	8	24	15	82	23	106
Rajshahi Division	9	46	14	99	23	145
Khulna Division	7	12	15	53	22	65
Chittagong Division	14	40	11	52	25	92
Total ..	38	122	55	286	93	408

As shown in Table XV-2 there are 93 Maternity and Child Health Centres (MCH) with a total of 408 beds in the country. In addition to this ther are 6 beds in each of the 150 Rural Health Centres and 113 beds in the three Lady Health Visitors' training centres. Thus there are 1,421 beds in total. The MCH centres are severely handicapped by the dearth of doctors and trained para-medical personnel.

There is no organized Industrial Health Services in the country at present. Industry has grown in and around large cities where several million of labourers are employed. Health care provided to these labourers either by Government or by the employers to protect them from the hazards of their occupation is inadequate. Although they can avail of the services provided by the general health services, they need special occupational health care to be arranged by developing Industrial Health Services. However, this aspect of the health services has remained neglected.

One of the major defects in our health sector programme is the lack of any data collecting system to assess the health situation existing at any one time, to evaluate the impact of a given programme on the health situation or even to plan action to prevent, treat or eradicate a health problem. A well planned epidemiological service with dependable system of collection of vital morbidity and mortality statistics backed by a laboratory service is necessary for the purpose. But although we have created a good base for the type of work needed in the Institute of Public Health, this has to be vigorously developed. There is a good microbiological laboratory with trained staff which can be easily developed into a central public health laboratory. There is also a nucleus of an epidemiological unit. It is now necessary to develop them so that an epidemiological service supported by a public health laboratory service can function.

The problem of providing adequate manpower even for the existing health programmes is a formidable one. Total number of doctors at present is approximately 7,000 giving doctor population ratio of 1:10,714,—one of the worst in the world. Moreover, a great majority of

these doctors (over 75 per cent) are working in urban areas causing almost a complete vacuum in the rural areas. Medical graduates are normally reluctant to join the health services on the present terms and conditions of posts in health services which are not considered attractive. Added to this is the lack of amenities in the rural areas which prevents them from going to villages. Thus quite a good proportion of posts in the urban health services and almost all of the rural posts are yet to be provided with doctors. As for specialists the situation is still worse. There are only about 259 specialists available in the country. Only 247 posts of specialists could be filled up so far. At present, 178 doctors are undergoing post-graduate training in the country and abroad. We still need 719 more doctors to be trained in various specialities to man the existing programmes (Table XV-3).

We have only about 700 Nurses, 250 Midwives and 275 Lady Health Visitors in the Health Services. The gross inadequacy of nursing services is obvious from the fact tha the doctor nurse ratio is 10:1, whereas normally it should be 2-5 nurses to 1 doctor. The situation is nearly as bad for para-medical and auxiliary personnel. In the health services there are about 980 sanitary inspectors, less than 1000 compounders, 170 laboratory technicians, 11 radiotherapy technicians and 20 physiotherapy technicians. The two unipurpose programmes, *viz.*, the Malaria eradication and Small-pox eradication projects, have about 12,000 field auxiliaries. It is clear that a large scale training programme to increase the manpower is urgently needed particularly in nursing and para-medical fields.

TABLE XV-3

Requirement of personnel with Post-Graduate qualification for existing programmes.

Serial No.	Name of Subject.	Total requirement.	Available Trained.	Under Training.	To be Trained.
1.	Anatomy	47	9	3	35
2.	Physiology	31	12	3	16
3.	Bio-Chemistry	23	4	1	18
4.	Pharmacology	30	13	3	14
5.	Pathology	114	20	9	85
6.	Microbiology	26	8	3	15
7.	Virology	7	..	..	7
8.	Parasitology	4	..	1	3
9.	Medicine	137	32	38	67
10.	Surgery	131	39	14	78
11.	Gynaecology	85	21	11	53
12.	Paediatric	40	8	14	18

TABLE XV-3—*Contd.*

Serial No.	Name of Subject.	Total requirement.	Available Trained. (in Service)	Under Training.	To be Trained.
13.	Opthalmology	46	21	6	19
14.	Ear, Nose & Throat	30	7	4	19
15.	Orthopaedic Surgery	10	1	4	5
16.	Anaesthesia	85	6	19	60
17.	Blood transfusion	29	5	7	17
18.	Radiology	84	20	9	55
19.	Radiotherapy	30	10	7	13
20.	Physiotherapy	8	2	..	6
21.	Radio-Isotope	8	1	2	5
22.	Dermatology	9	2	7	..
23.	Dentistry	32	..	4	28
24.	Psychiatry	17	5	8	4
25.	Neuro-Surgery	8	..	..	8
26.	Neuro-medicine	8	..	..	8
27.	Neuro-Radiology	8	..	..	8
28.	Neuro-Anaesthesia	8	..	..	8
29.	Cardiac Surgery	8	..	..	8
30.	Cardiac Medicine	8	..	..	8
31.	Cardiac Physiology	8	..	..	8
32.	Cardiac Anaesthesia .. .	8	..	..	8
33.	Urology	8	1	..	7
34.	Haematology	1	..	..	1
35.	Blood Diseases	2	..	..	2
36.	Gastro-Enterology	2	..	..	2
37.	Entomology	2	..	..	2
38.	Epidemiology	2	..	1	1
	Total ..	1,144	247	178	719

The institutions for training manpower in the health sector have so far emphasized the production of doctors. Thus there are 8 Medical Colleges with intake capacity of 1,400 students, and only 5 Nurses' Training Centres, 3 Lady Health Visitors' Training Centres and only 1 Training Institute for Para-medical personnel, as shown in Table XV-4.

TABLE XV-4

Institutions for Training of Nurses and Para-medical personnel.

Institutions.	Number.	Annual intake capacity for training.
Nurses' Training Centres	5	325
Lady Health Visitors' Training Centres	3	115
Para-medical Training Institute	1	..
(a) Laboratory Technicians	..	50
(b) Dental Technicians	..	20
(c) Sanitary Inspectors	..	40
(d) Radiographers	..	10
(e) Physiotherapy Technicians	..	10
(f) Pharmacists	..	50
(g) Blood Bank Technicians	..	10

More recently (1972) due to acute paucity of nurses a crash programme for training of nurses was launched with an initial intake of 450.

Difficulties are being faced in finding teaching staff both for Medical Colleges and Training Institutions for nurses and para-medical personnel. The Institute of Post-Graduate Medicine and the Institute of Chest Diseases can at present take 40 and 12 doctors respectively for post-graduate training. A post-basic College of Nursing which was started on make-shift basis could not serve its purpose for want of fund and personnel. This must be revived without delay. A second para-medical training school has been built at Rajshahi, but is yet to start functioning.

While the lack of physical facilities and manpower had remained a persistent problem, the existing situation about drugs, medicine and other essential supplies for the health services have added to the inefficiency of the health system. Our Pharmaceutical Industries are not able to meet the internal demand for drugs and medicines. There is little co-ordination between production and priority requirement. Import of drugs and chemicals for the

pharmaceutical industry appears arbitrary. The system of quality control is rudimentary. As a result there is an acute shortage of drugs and medicines. Whatever is available is often of sub-standard quality. In addition, the distribution system is inefficient. The Health Service has its own central medical stores at Dacca and a few sub-depots at the periphery, but supplies particularly at the periphery are often irregular and inadequate.

The administrative machinery to plan and implement health programmes is rather insufficient. Because of inadequate follow-up and evaluation most of the development programmes have fallen short of targets. Too much centralization of authority has made implementation difficult. Co-ordination needs to be strengthened between the different sections of the Ministry and the Directorate and with other Ministries. There are frequent delays in release of funds, completion of construction works and import of equipments, etc. The entire process has, therefore, to be streamlined.

15.1.3 Objectives

(i) To create a health infra-structure in the rural areas for providing integrated and comprehensive health services through Thana Health Complexes and Union Sub-Centres.

(ii) To ensure integretion between the Family Planning and the Health Programmes at the grass root level under the leadership of Thana Health Administrator to attain the maximum possible prevention of births in rural areas.

(iii) To provide well-organized health care programme to infants, children and mothers by strengthening MCH services with a view to reducing infant mortality and maternal mortality rates.

(iv) To ensure effective control/eradication of communicable diseases and to organize epidemiological services supported by well-equipped public health laboratories for meaningful execution of communicable disease control programmes.

(v) To establish well-organized industrial health services for the industrial workers, to provide protection against industrial health hazards, to create a healthy environment at their place of work and to provide medical care to the workers and their families.

(vi) To improve the quality of the existing hospital facilities and to create new hospital beds with major emphasis on the establishment of at least one 25-bed hospital in each Rural Thana and to reach a target of one hospital bed for every 3,500 persons by the end of the Plan period.

(vii) To provide specialized hospital facilities for treatment and rehabilitation of Mukti-Bahini personnel who were injured in the war of liberation and to create additional hospital beds for specialized treatment of Tuberculosis, Leprosy, Cancer, Children and Mental diseases.

(viii) To create adequate under-graduate and post-graduate teaching and training facilities for the medical, para-medical and nursing personnel and to ensure proper service conditions for optimum utilization of the personnel.

(ix) To ensure availability of life saving drugs for treatment of the sick and immunizing agents for prevention or control of communicable diseases.

(x) To ensure inter-sectoral co-operation and co-ordination for achieving improvement of the environmental sanitation, housing facilities, potable water supply, etc., at the place of living and of work for every citizen.

15.1.4 **Strategy**

(i) The basic strategy of the First Five-Year Plan in the Health Sector will be to shift the emphasis from curative to preventive health care to bring a balance between the two and develop a delivery system that will provide integrated and comprehensive health care to our rural population. Comprehensive health care, by intergrating the full range of preventive and curative services, will be delivered at community level in the rural areas by a re-organization of health care disciplines, so that the specialists, doctors, nurses, medical auxiliaries and para-medical personnel can work in a co-ordinated manner. Accordingly services would include community and environmental action, home and family care, out-patient service and screening, general and specialized in-patient care, and physical and social rehabilitation. The instrument to achieve this would be a Rural Health Complex (comprising a rural health centre and a 25 bed hospital) with satellite sub-centres established at each thana. Referral services will be provided to the Rural health complex through the Subdivisional and District Hospitals (which will be upgraded) and other teaching and specialized hospitals. Thus a broad-based infra-structure for health services will be established in the rural areas with a balanced super-structure at the urban level with a view to ensuring equitable distribution of health care facilities throughout Bangladesh.

(ii) The emphasis in the delivery system of health care will be shifted from individual to community whose basic unit will be the family. The health system will endeavour to protect and promote the general health of the family while providing as far as possible appropriate medical care and treatment of the sick members of the family.

(iii) Since the focus of the professional attention will be shifted from individual to community, understanding of the total community ecology and the development process as it affects education, agriculture, and economic progress will be necessary in deciding priorities and planning appropriate action. Development and utilization of vital statistics, epidemiological service and Public Health Laboratory for planning meaningful public health action will be an integral part of the strategy.

(iv) Since the health service and its delivery system will be based on integrated and comprehensive health care at community level a new pattern of education for medical and auxiliary personnel has to be developed. The students of all institutions producing health manpower must be oriented towards community medicine by reframing the syllabi which should include training in community medicine and comprehensive health care through actual field work.

(v) Although a number of new teaching institutions will be established for training doctors in curative medicine and public health both at under-graduate and post-graduate levels, the problem of shortage of doctors will continue to persist during the plan period. Hence para-medical personnel and health auxiliaries must be made responsible for as much of both preventive and curative work as quality standard permits making it possible for the doctors to

concentrate his time where his specialized skill is most needed. Since auxiliaries can be trained and supported with considerably less expenditure of time and money than doctors, a new cadre of medical assistants will be created. The medical assistants will be utilized under doctor's supervision to screen out the really sick patients for doctor's attention. Those requiring only routine and simple medical care will be attended to by auxiliaries adequately trained for the purpose.

(vi) Supplies of adequate quantity of drugs and medicines have to be ensured through imports and by encouraging domestic manufacture as far as practicable on the basis of actual requirements. The existing system of imports and manufacture will, therefore, be reviewed and reformulated. Bottlenecks created by an over-centralized system of supplies of drugs and medicines will be removed by establishing supply depots and sub-depots throughout the country.

15.1.5 Rural Health

A. *Integration of Unipurpose Programmes*

In the past there had been a tendency to launch unipurpose programmes to solve individual public health problems. All such programmes have the following inherent drawbacks:

(i) They are self-annihilating in the sense that as soon as the goal is achieved the programme is to be disbanded or kept in a skeleton form. Hence it is difficult to attract good quality, dedicated workers to these programmes which lack secure career prospect.

(ii) There is duplication of efforts, expenditure and trained personnel in different programmes.

(iii) Some of the projects, as they are now, have top heavy personnel structure leading to concentration of technical and supervisory personnel at the centre. Since these programmes are mainly concerned with rural population it is necessary that major effort and supervisory activities be decentralised at the periphery in the rural areas.

(iv) Financial allocations in different unipurpose projects are grossly disproportionate if we consider the actual need. While there are liberal allocations in some programmes, leading to non-utilization of allocated funds or wastage the other programmes cannot be made operational because they are short of funds.

To remove these drawbacks, it will be necessary to integrate all unipurpose projects concerned with communicable diseases (including Malaria, Tuberculosis, Leprosy, Small-pox and Cholera) with provision for strong supervision of all activities in the fields. The services so integrated with the General Health Services will have their base at Rural Health Centres at thana and union levels. However, integration will be a phased operation. It will take into account the results achieved by the Malaria Eradication Programme and will reflect the need for concentrated attack against small-pox in districts where the disease has reached epidemic proportion.

To support Malaria Eradication Programme (MEP) which has been found very useful, Taka 18·233 crore and Taka 1·00 crore have been allocated for the Plan period against the on-going and new schemes respectively.

Allocation for Health Services including M. E. P. in the Plan Period (1973—78)

(Taka in crore)

Status of Scheme	M.E.P	Health	Total
On-going	18·2332	152·3553	170·5885
New	1·0000	28·4115	29·4115
Total ..	19·2332	180·7668	200·0000

As a first step towards integration, preventive and curative health care in all the districts are to be brought under overall supervision of the Directorate of Health Services. At present, there is a dual system in a number of districts where curative health care is under the Directorate of Health Services while preventive care is the responsibility of the District Council. This dual system of control will be abandoned in order to achieve effective co-ordination, etc., of preventive and curative health. The management of the health services will be shared by the national Government and the Zilla Parishads.

B. *Rural Health Complex*

Rural Health Complex has been visualized as the Unit Organization for providing integrated and comprehensive health and family planning services to the rural population. Each rural health complex will have two components:

(i) Rural Health Centres at Thana level and Sub-centres at Union level.

(ii) 25-bedded Hospital at Thana level.

C. *Rural Health Centre*

One Rural Health Centre (RHC) will be created preferably in each rural thana headquarters with sub-centre at union level. There are at present 356 rural thanas and 3,698 rural unions. The intention is to provide one RHC in each rural thana and one sub-centre in each rural union. Each union sub-centre will give coverage to a population of approximately 12—15 thousands. The establishment of these health centres and sub-centres will have to be spread over a period of several years depending on resources and manpower available.

The integrated health services as outlined above will be executed at village level by well-trained multipurpose workers (Basic Health workers) under supervision of several tiers of supervisory personnel.

These basic health workers will be matriculates and will be given special training. Each basic health worker will remain in charge of a population of not more than 4,000 (this has been found to be the critical ratio in a number of projects run under the guidance of World Health Organisation). Each basic health worker will go for regular home visits according to planned schedule within his or her area so that each family is visited at least once a month.

During their home-visits they will perform the following functions:

1. *Immunization:* Primary and revaccination against Small-pox, Cholera and Typhoid as well as BCG vaccination.

2. *Education:* In respect of environmental sanitation, water purification, family health including family planning.

3. Collect blood sample of suspected malaria cases and sputum sample of suspected T.B. cases and pass these samples on to the Rural Health Centre Laboratory.

4. Supply anti-malarial, anti-tuberculosis and anti-leprosy drugs to the confirmed cases for domicilliary treatment.

5. Take part in anti-malaria activities and other anti-epidemic programmes.

6. Maintain family health and family planning cards through which vital statistics and other health and family planning data will be collected.

These basic health workers will work under the supervision of one Assistant Health Inspector (AHI) who will remain in-charge of 4 Basic Health Workers at union level and will be directly supervised by the Medical Officer or the medical assistant in charge of the sub-centre.

In addition, every sub-centre at union level will have a MCH clinic under a Lady Health Visitor who will provide MCH care including Family Planning.

The Medical Officer or Assistant will work as the team leader and will remain responsible for the integrated health care for the entire union. Wherever necessary, he will refer cases to and seek help and guidance from the Thana Health Administrator, who will be his supervisor. At thana level the Rural Health Centre will be the headquarter for the integrated health services provided in the entire thana through its union sub-centres. In addition to serving the union in which the Thana Health Centre is situated, it will provide leadership and referral service to all the sub-centres.

The Thana Rural Health Centre will have a clinical diagnostic laboratory, a MCH clinic supported by six maternity beds, a well-equipped outdoor dispensary and a central store for supplies to cater to the requirements of the sub-centres within its control. It will have two full-time Medical Officers, one of them female. However, at the initial stage it may be necessary to substitute the Medical Officers by experienced and trained Medical Assistants.

The RHC will remain under the overall supervisory control of the Thana Health Administrator who will be an experienced medical man, preferably with public health training.

The thana rural health centre will receive the referral services at the 25-bed hospital of the Rural Health Complex, whenever required.

It is estimated that about 16,000 Basic Health workers will be needed for the entire programme. Since the programme will be phased over a longer period, approximately 10,000 Basic Health Workers will be required during the First Five-Year Plan period. At present about 4,000 Health Assistants and Vaccinators and approximately 5,000 Malaria Supervisors are working in a number of unipurpose projects and regular Health Services. With integration, therefore, about 9,000 workers will be readily available for being absorbed as Basic Health workers after a short course of training to familiarize them with their wider work responsibilities. Additional basic health workers will be recruited and given formal training at the Para-Medical Institutes and field training at the Thana Health Complexes.

D. *Hospitals at Rural Thana Level*

While the personnel of the RHC at thana level and the sub-centre at union level will provide the preventive health services and family planning facilities in the field as well as at the Clinics of the RHC and Union Health Centre, the curative health services will have to be extended to rural areas by establishing hospitals at thana level for the treatment of both outdoor and indoor patients. These Thana Hospitals will also open up opportunity for extending post-partum Family Planning Programme to the rural areas and will ensure the provision of physical facilities required.

Initially, each thana health complex will be provided with a 25-bed hospital, but these will have provision for later extension to 50-bed hospitals. Thus, 8,900 hospital beds will be created during the First Five-Year Plan period. The upgrading of these hospitals to 50-bed hospitals will have to be taken up during subsequent plan periods.

The estimated cost of establishing each 25-bed hospital is Tk. 0·064 crore making a total Plan expenditure for the 356 rural thanas combined of nearly Tk. 23·00 crore.

These hospitals need not be equipped or manned for highly specialized treatment since such cases can be referred to sub-divisional/district/Medical College hospitals. However, there must be arrangment for treatment of all common diseases now prevailing in the rural areas of our country.

Thus the two components of the Rural Health Complex, namely the RHC with sub-centres and the 25-bed hospital will bring about a better balance between preventive and curative health services; this will also provide a well-supervised frame-work for extending Family Planning Services as required in the homes, in clinics and hospitals.

The present position and programme regarding the establishment of Rural Health Centres, Union Sub-Centres and Thana Hospitals are shown in Table XV-5.

TABLE XV-5

Establishment of Rural Health Centres, Sub-Centres and 25-Bed Hospitals in Rural Areas during the Plan period (1973—78).

(Taka in crore)

Description.	Number as of June, 1973.	Increase during Plan period.	Total number at the end of Plan period.	Number of hospital beds at the end of Plan period.	Estimated cost during Plan period.
1	2	3	4	5	6
1. Rural Health Centres at Thana level.	160	196	356	..	20·20
2. Sub-Centre at Union level	Nil	1,068	1,068	..	22·30
3. 25-bed Hospital ..	Nil	356	356	8,900	22·90
Total ..					65·40

Once this infra-structure for health services at grass-root level is established and start functioning, the goal of providing satisfactory and comprehensive health care including adequate family planning services to rural population will begin to be realised.

E. *Hospital Beds*

The total number of hospital beds of all categories stands at 12,300 of which 10,450 are in the public sector, including beds in District and Sub-divisional Hospitals, teaching and specialised hospitals. The overall hospital bed population ratio now stands at one for 6,350 persons. Particularly in the rural areas there is an acute shortage, since almost all hospital beds in the public sector are in the urban areas.

The Plan provides for the development of 356 thana hospitals as described above and further development of hospital facilities at district and sub-divisional levels and teaching and specialised hospital.

Even a very conservative estimate of requirement in the urban areas calls for a 250-bed hospital at district and sub-divisional levels. These hospitals will also serve as referral hospital for Rural Health Complexes. These must be manned and equipped properly so that major specialist services can be made available. During the First Five-Year Plan period all district and sub-divisional hospitals will be upgraded to provide at least 100 beds in each (*vide* Tables XV-5A and XV-6).

During the Plan period one Post-Graduate Institute of Medicine and at least one new Medical College will be established and existing Medical Colleges will be strengthened. Existing teaching institutions are not adequate to produce sufficient number of Medical Graduates and Medical Specialists to cope even with present requirements. It is imperative, therefore, that new Medical Colleges and Post-Graduate Institutions are created as rapidly as possible. This will at the same time add to the number of available hospital beds in teaching institutions, which now stands at 3,900 (including 430 beds in the Institute of Chest Diseases). During the Plan period 1,530 additional beds will be created in these Institutions (*vide* Table XV-7).

TABLE XV-5A.

Hospital Beds at District level

Name of Hospital.	Number of beds.		Expected increase during Plan period.
	1972-73 Benchmark.	1977-78. Target.	
1	2	3	4
1. Chittagong General Hospital	225	225	...
2. Rangamati Sadar Hospital	25	100	75
3. Noakhali Sadar Hospital	100	100	...
4. Comilla Sadar Hospital	110	110	..
5. Faridpur Sadar Hospital	80	100	20
6. Tangail Sadar Hospital	22	100	78
7. Dinajpur Sadar Hospital	76	100	24
8. Bogra Sadar Hospital	100	100	...
9. Pabna Sadar Hospital	100	100	...
10. Khulna Sadar Hospital	130	130	...
11. Jessore Sadar Hospital	77	100	23
12. Kushtia Sadar Hospital	50	100	50
13. Patuakhali Sadar Hospital	23	100	77
Total	1,118	1,465	347

TABLE XV-6

Hospital Beds at Sub-Divisional level

Name of the Sub-division.	Number of hospital beds.		Expected increase during Plan period.
	Existing.	Target.	
1	2	3	4
1. Narayanganj	65	100	35
2. Munshiganj	20	100	80
3. Manikganj	20	100	80
4. Kishorcganj	25	100	75
5. Jamalpur	25	100	75
6. Netrokona	26	100	74
7. Madaripur	22	100	78
8. Gopalganj	50	100	50
9. Goalundo (Rajbari)	25	100	75
10. Cox's Bazar	32	100	68
11. Ramgarh	10	100	90
12. Brahmanbaria	26	100	74
13. Bandarban	10	100	90
14. Feni	20	100	80
15. Chandpur	50	100	50
16. Habiganj	34	100	66
17. Moulvi Bazar	22	100	78
18. Sunamganj	20	100	80
19. Nawabganj	25	100	75
20. Natore	30	100	70
21. Naogaon	50	100	50
22. Thakurgaon	25	100	75
23. Kurigram	50	100	50
24. Nilphamari	25	100	75
25. Gaibandha	13	100	87
26. Jaipurhat	Nil	100	100
27. Sirajganj	50	100	50
28. Bagerhat	50	100	50
29. Satkhira	23	100	77
30. Pirojpur	24	100	76
31. Bhola	30	100	70
32. Jhalakati	Nil	100	100
33. Barguna	Nil	100	100
34. Magura	50	100	50
35. Narail	14	100	86
36. Jhenaidah	50	100	50
37. Chuadanga	50	100	50
38. Meherpur	25	100	75
Total ..	1,086	3,800	2,714

TABLE XV-7

Number of Hospital Beds in Teaching Institutions.

General Beds attached to Teaching Institutions.	Number of Beds.		
	1972-73 (Existing).	1977-78 Target.	Expected increase.
1. Dacca Medical College Hospital	900	900	..
2. Sir Salimullah Medical College Hospital ..	420	500	80
3. Chittagong Medical College Hospital	500	500	..
4. Rajshahi Medical College Hospital	500	500	..
5. Mymensingh Medical College Hospital	500	500	..
6. Sylhet Medical College Hospital	200	500	300
7. Barisal Medical College Hospital	250	500	250
8. Rangpur Medical College Hospital	100	300	200
9. Institute of Post-Graduate Medicine	100	500	400
10. Khulna Medical College Hospital	..	300	300
Total	3,470	5,000	1,530

Some patients need specialized hospital services due to the peculiar nature of the disease, such as Tuberculosis, Leprosy, Infectious diseases, Children's diseases, Mental diseases, Cancer and Casualty patients.

The aim for the forseeable future is to provide each of the present four divisions of the country with at least 600 beds for Tuberculosis, 500 beds for Infectious diseases, 400 beds for Children's diseases, 400 beds for Mental diseases, 100 beds for Cancer and 100 beds for Casualty. The creation of these beds will have to be phased over serveral Plan periods. During the First Plan period the expansion of the number of specialized beds will be limited to a little over 1,400 giving a total of 3,070 specialized Hospital beds by 1978. The majority of the new beds will be for Tuberculosis, Infectious diseases and Children's diseases (*vide* Table XV-8).

TABLE XV-8

Beds in Specialized Hospitals.

Speciality	Number of Beds.		
	Existing 1972-73.	Target 1977-78.	Increase during the Plan period.
Tuberculosis	966	1,200	234
Leprosy	60	120	60
Infectious Diseases	180	500	320
Children Diseases	Nil	400	400
Mental Diseases	400	600	200
Cancer	Nil	100	100
Casualty	Nil	150	150
Total ..	1,606	3,070	1,464

15.1.6 Urban Health Care

Majority of the District and Sub-divisional hospitals are lacking in sufficient number of beds to cope with the pressing requirement of the treatment of the sick. Moreover, lack of adequate staff and equipments and irregular flow of supply of drugs and medicines have increasingly become a problem. The situation will improve with the upgrading of these hospitals to the status of referral hospitals and the increase in the number of technical staff which will uplift the standard of treatment. Raising of number of beds in these hospitals (*vide* Table XV-5 & 6) will also help to improve the situation. In addition to this the services of the specialized hospitals and those attached to teaching institutions will be readily available to the urban population.

Maternity and Child Health Care in urban areas will be streamlined by establishing Maternity and Child Health Centres attached to each Sub-divisional and District hospitals.

Industrial workers in the urban areas will be given health care through industrial health programme.

In addition to Governmental effort in the urban health programme the municipal authorities in the respective areas will continue their own health programme under the guidance of and in collaboration with the government as usual.

15.1.7 Maternity and Child Health Services

The need for greater emphasis on Maternity and Child Health (MCH) Programme in Bangladesh will be obvious from the fact that one in six infants die at birth or within the first year of life and the maternal mortality rate is as high as 30 per 1,000. It is vital, therefore, that specific programme to uplift the status of existing MCH services is included in the Health Plan. In addition to reducing maternal and infant mortality rates, organized MCH Centres will provide very effective basis for launching Family Planning Programme both clinical and non-clinical under the supervision of trained personnel.

There are at present only 93 MCH Centres of which 38 centres are under Government and 55 are run by private efforts. Only 40 of these centres are situated in rural areas. Moreover, the staff strength of these centres is grossly inadequate. Without any Medical Officer on the staff, these centres have to gain the confidence of their prospective clients.

Further, the L.H.Vs. who are in charge of these Centres cannot cope with regular home-visit.

Each of the 150 Rural Health Centres that have been established so far, contains a MCH Unit. However, quite a number of them are not functioning properly due to want of staff and/or equipment. Nevertheless, since the RHC as an organisation is better known to the villagers due to its general health programme and better professional reputation, MCH Units of Rural Health Centres, even though under-equipped, may have given better services and attracted larger number of mothers and children than have the isolated MCH centres. The Plan, therefore, provides for MCH Services in rural areas to be expanded through MCH Unit of the Rural Health Complexes and their Sub-Centres. By the end of the Second Five-Year Plan period all the rural thanas and rural unions will be covered

with Health Complexes and Sub-Centres respectively and thus a net work of MCH Units will be available throughout the rural areas of the country. As the Rural Health Complexes will have well-equipped hospitals referral services will also be available to these MCH Units.

Existing MCH Centres run by the Government will be brought under the supervisory control of Thana Health Administrator in rural areas and SDMOH in the urban areas. Referral services will be made available to these centres at R H Complex or at Sub-divisional or District Hospitals.

As for Urban areas MCH centres will be attached to each of the District and Sub-divisional Hospitals with adequate staff and equipment.

Four new LHV Training Centres will be established in four large towns, including Chittagong and Khulna, for producing sufficient number of LHVs for the health programmes. These training centres will also provide MCH services. The MCH programme in these populous areas will thus be strengthened further to give better coverage.

15.1.8 Industrial Health

Already several lakhs of workers are engaged in mills and factories and within the foreseeable future the size of industrial labour force will increase manifold. The majority of industrial enterprises have so far failed to provide organized health services for their workers; also there has been no serious effort by the Government to provide such services.

Industrial workers are liable to be exposed to additional risks of health hazards because of their occupation and occupational environment. They need, therefore, care from specialist in Industrial Medicine and Health. While general Health Services may take care of the other health problems prevailing in the population in general, a special Industrial Health Programme is required.

Moreover, in Bangladesh, in the early stages of industrialization most of the industrial workers are drawn from the rural areas, who retain contact with their home villages. While the workers themselves live and work in a more and more congested and comparatively unhealthy environment, the maintenance of contact between the industrial workers and their relatives in the rural areas has increased the spread of infectious diseases (*e.g.* tuberculosis, etc.) to the general population. An organized Industrial Health Programme will be designed to control this situation by proper supervision of the environmental conditions of work and by periodical physical check up of individual workers. Thereby industrial and environmental health hazards for the industrial labour force can be minimised and communicable diseases, if any, may be detected at an early stage and referred for appropriate control and treatment under the general health services. A close co-ordination between industrial health programme and general services will be required to achieve this objective. During the First Five-Year Plan period a well-planned Industrial Health Programme will be introduced. The programme will be organized with adequate well-trained manpower supported by a full-fledged Industrial Health Laboratory specially equipped and manned for the purpose.

The Industrial Health Services will be established to serve directly a two-fold purpose, namely (i) to minimize the detrimental effects associated with the hazardous occupations and

(ii) to promote measures designed to create healthy working conditions. However, provisions of preventive and curative health care outside the place of work and health services for ailments which may arise without reference to occupation, will continue to be the responsibility of the General Health Services.

For successful implementation of the programme in the field, close co-operation and co-ordination between Health Ministry and other Ministries involved (*viz.*, Industries, Labour and Law) will be required.

It is envisaged that during the First Five-Year Plan period an amount of Tk. 0·30 crore will be spent for organizing Industrial Health Programme including establishment of an Industrial Health Laboratory.

15.1.9 Public Health Laboratory Services

A. *Diagnostic and Epidemiological Services*

The major health problem in Bangladesh is high prevalence of communicable diseases. Hence communicable disease control and eradication have been given high priority in the preventive health programmes. Any such programme, however, requires extensive laboratory investigation both for individual cases and large scale outbreaks. Hence there is a need for establishing a full-fledged epidemiological organization supported by Public Health Laboratory Service. The existing facilities are rudimentary. The Microbiological Laboratory of Public Health Institute at Dacca, which has an epidemiological unit in name only, is now working in this field. Both the laboratory and the epidemiology unit are ill-equipped and understaffed and cannot function effectively. Moreover, the laboratory diagnostic service in District or Sub-divisional level is non-existent.

During the First Five-Year Plan, schemes for developing the Public Health Laboratory Services and Epidemiological Services will be introduced. These will ultimately be developed into full-fledged Public Health Laboratory Services and Epidemiological organization in future plan periods through expansion of the programmes gradually.

B. *Production of Anti-Sera and Toxoids*

Some of the major preventive health programmes for control of communicable diseases are dependent on immunizing agents, *e.g.*, Toxoids, Sera and Vaccines. Moreover, in case of some of these communicable diseases specific anti-sera are the only reliable means of curative treatment. In Bangladesh the Institute of Public Health is the only organization which has the capability in terms of expertise and physical facility to produce these agents. At present only two bacterial and two viral vaccines are being produced here of which freeze-dried small-pox vaccine has earned reputation throughout the world for its potency and stability.

During the First Five-Year Plan period a unit will be developed in the Institute of Public Health for the production of anti-sera and Toxoids, including the important anti-sera, *viz.*, anti-tetanus, anti-diphtheria and anti-rabies sera, and the triple vaccine (D. P. T). This will not only save the country's foreign exchange but with adequate local supply of these sera it will also be possible to strengthen the programmes for treatment and prevention of these common but preventable communicable diseases.

C. *Production of Infusion Fluids*

Diarrhoeal diseases including cholera are the most common communicable diseases in Bangladesh. The fundamental basis of their treatment lies in infusion of suitable salts and fluids to bring back fluid and ionic balance in the human body. However, the inadequate supply of infusion fluid of proper type is a chronic problem and has been the cause of large number of avoidable deaths. Moreover, the general hospitals require huge quantity of infusion fluids in the surgical and medical wards for treatment of shock and other diseases. The purchase of infusion fluids from abroad is costly in general and in terms of foreign exchange in particular.

The Institute of Public Health has taken preliminary steps towards producing infusion fluids with the help of aid-giving agencies, in particular UNICEF. A full-fledged programme has been introduced in the First Five-Year Plan period to establish a unit for production of infusion fluids of different types in adequate quantity to meet the demand of the entire country.

15.1.10 Institute of Nutrition

The Institute of Public Health has at present a very small Laboratory for Nutrition with nominal facilities and manpower. The nutritional aspect of the health problem has so far been neglected although several surveys have indicated that nutritional deficiency is quite common in our population specially in pre-school children and pregnant mothers. A thorough investigation to clearly delineate the problem and intensive research to find solution for such problems appear to be imperative. In view of this a scheme to establish an Institute of Nutrition will be introduced in the First Five-Year Plan.

15.1.11 Medical Research

Medical research has not been given its due importance in the past. Although a number of good quality research works were carried out in Bangladesh in some of the fields of Medicine and Public Health, the medical research efforts have been totally inadequate. The reasons are many, including shortage of staff and trained technicians, non-availability of equipments, apparatus and laboratory animals and the non-availability of reference books and scientific journals. There is no separate allocation of research grant to medical institutions. High Standard of research ability is no longer an essential requirement for academic recruitment even for professorial chairs. Thus there is lack of both the means and the incentives for research work.

To encourage research the aforesaid barriers are to be removed and medical institutions having potentialities for undertaking research should be provided with reasonable research grants to be spent at the discretion of the Head of the Institution. The research grants will be allocated through the National Medical Research Council, who will receive a total allocation of Tk. 0·10 crore for the Plan period.

Since medical research in basic and clinical subjects can be located in existing institutions it may not be necessary at the initial stage to establish independent research institutes. Major health problems like control and eradication of communicable diseases should receive priority in research. An on-going scheme for epidemiological research and a new scheme for research in clinical tuberculosis have been included in the First Five Year Plan.

15.1.12 Development of Man-power

Effective implementation of Health Programmes in the past has been hindered more often by non-availability of Medical and Para-Medical personnel than by lack of funds or physical facilities. It is comparatively easy to define the requirements for construction of buildings and purchase of required equipments; the difficulties of planning and implementation are more pronounced and persistant when it comes to the development of medical and para-medical man-power.

A. *Medical Man-power*

1. Medical Graduates

Medical education is one of the most time-consuming processes. It takes 6 to 7 years to produce doctors with minimum training and still many more years to produce teachers and specialists.

Total number of qualified doctors, including teachers and specialists, does not exceed 7,000 at present. This gives a doctor population ratio of about 1:10,000. If we consider the loss of doctors due to death, retirement, and migration and take into account the additional requirement of doctors due to population increase we shall have to produce at least 600 doctors annually even to maintain this poor ratio. The rate of production of doctors in the past was not very satisfactory; on the average only about 240 doctors came out of Medical Colleges annually during 1964—68. Recently the production rate has improved but the number remains only moderate.

During the First Five-Year Plan period a determined effort to produce doctors will be initiated. The on-going schemes will be completed at a faster rate, one Medical College will be expanded and one more new Medical College will be established during the plan period. Policies will be designed to ensure that all medical graduates can be absorbed at home and there is no further brain drain. Positive measures will be adopted regarding doctors' service conditions and emoluments so as to make them comparable to those of other professionals, considering the time and effort required to qualify as a medical doctor.

In view of the Government's declared policy of extending health facilities in large scale to rural areas it is all the more necessary to formulate and implement effective measures to attract doctors to villages providing incentives for rural jobs. So far doctors have mostly chosen to work only in urban centres.

TABLE XV-9

Expected Production of Doctors during the Plan Period from the Medical Colleges.

Medical College.	1973-74	1974-75	1975-76	1976-77	1977-78	Total.
Dacca	100	100	140	140	140	620
Chittagong	72	72	105	105	140	494
Rajshahi	72	72	105	105	140	494
Sylhet	52	52	70	70	112	356
Mymensingh	52	52	70	70	112	356
Rangpur	--	--	35	52	112	199
Barisal	35	35	52	70	112	304
S.S. Medical College ..	105	105	140	140	210	700
Total ..	488	488	717	752	1,078	3,523

The existing eight medical colleges have an intake capacity of 1,405 students annually. One more medical college will be established at Khulna during the Plan period increasing the annual intake capacity to 1,500. Admission of students into the medical colleges will be rationalized during the plan period. A conservative estimate for the Plan period for production of medical graduates gives a gross addition to the current number of 7,000 doctors of little over 3,500 doctors (*vide* table XV-9). Allowing for normal retirement and death of doctors, the doctor population ratio of 1: 10,000 to day may be increased to around 1:9,000

2. Doctors with Post-Graduate training in Curative Medicine

At present more than 50 per cent of the posts for teachers and specialists are vacant. There is, therefore, an urgent need for greatly accelerated production of doctors of these categories through an intensive post-graduate training programme initiated during the First Five-Year Plan period. High priority will be given to cover this gap by developing well-equipped and adequately staffed post-graduate institutions. The present acute shortage of teachers in the basic subjects threatens to lower the standard of doctors. Without a sound knowledge in basic subjects students often fail to grasp the intricacies of clinical theories and practices. It is imperative, therefore, that facilities for training in basic subjects in the Post-Graduate Institutes be strengthened.

3. Doctors with training in Preventive Medicine and Public Health

Since there is an acute shortage of doctors specially trained in public health, most of the preventive health programmes have so far been supervised by medical personnel without preventive medicine and public health qualifications. During the plan period Post-Graduate training of Doctors in Public Health and Preventive Medicine will be supported by the establishment of a Post-Graduate School of Preventive Medicine and Public Health.

4. **Curricula in Medical Colleges and Post-Graduate Institutes**

Present Curricula followed in Medical Colleges and Post-Graduate Institute do not give due emphasis on the special health problems of Bangladesh. The common communicable, nutritional and other diseases as well as preventive and community medicines should form the major portion of the syllabus. There must be a full-fledged Department of Preventive Medicine under qualified professors in these subjects in each medical college. Each medical college would have a demonstration area for field work for the provision of comprehensive health care through active participation of teachers, students, nurses and other staff.

B. *Need for Creating a Cadre of Medical Assistants*

With only one doctor for a population of 9 to 10 thousand on an average it is not possible to deliver medical care to more than a small proportion of the people. For the rural population the problem is aggravated by the concentration of doctors in the big cities and towns. It is impossible to fill the gap within one or two decades. The solution must for a long time be found by creating a cadre of medical assistants.

At least seven developing countries in Africa and one in South West Pacific region have adopted system of medical assistants with very good results. China's peasant doctors are also well-known for the revolutionary improvement achieved by their services in delivering medical care. Even in developed countries like US, UK and USSR a cadre of auxiliary medical workers known as medical assistant or feldsher has been introduced to strengthen the system of delivery of medical care.

Creation of such a corps of medical assistants can help to solve the problem of dearth of doctors in Bangladesh. These auxiliary personnel may play a number of roles starting from physician's assistants as in USA, to the feldsher of USSR, who functioned at one time as a doctor's substitute. Medical assistants may support the doctor by taking the more routine work of the doctor's hands and also by performing some more complex tasks under the guidance and supervision of the doctors. Where the services of doctors are not available they can be called upon even to replace the doctors. Thus their roles are differentiated by the degree of responsibility.

A medical assistant may be suitably trained to work in rural health centre as the head of a team of health workers under the supervision of the Thana Health Administrator or he can remain in-charge of a sub-centre as a substitute of a doctor. His services may also be conveniently utilized in out-patient departments of the Sub-divisional and District or outlying Hospitals where a shortage of doctors prevails. He would apply the preventive measures prescribed by the higher health authorities and meet the needs of the population under his care for simple treatment. He should be able to attend to the more common complaints, treat the simpler cases and refer the more complicated ones to the nearest doctors.

Creation of a cadre of medical assistants to improve the medical and health care situation in the country does not mean relinquishing the efforts for training more doctors. The doctor is indispensable, but he must accept assistance which will allow him to devote his

energies to act as the leader of a team performing tasks that call for his superior skills, leaving the medical assistants to handle the simpler tasks.

Training of medical assistants will be arranged by developing a training centre around each of the modernized sadar hospitals (8-10 in number). Each centre may admit about 80 students to start with. The National Medical Institute at Dacca and Mirjapur hospital of Tangail may also be utilized as such as training centres. Thus in ten or more centres at least 800 students can be trained in each batch. With a course designed for two years approximately 750 medical assistants will be produced each year with effect from 1975-76.

Minimum academic qualification for recruiting students for training as medical assistants should be HSC in Science with Biology, Physics and Chemistry (*i.e.* Pre-medical Group of subjects). The two-year courses would comprise six months' pre-clinical and one year clinical bed side medicine, followed by six months' internship in district/rural hospitals. The syllabus should be relatively simple with emphasis on preventive medicine and patient care.

Qualified medical assistants who have completed at least three years' services in the rural areas under any national health programme should be eligible for admission into medical colleges for MBBS Course. The selection of candidates would be made on the basis of performance during the three years' service as medical assistant as well as the fulfilment of usual requirements for admission into the medical colleges. However, all the relevant issues including this course of studies and the duration thereof will be determined by a committee to be set up by the Government for the purpose. The selected candidates for MBBS course will be given deputation terms during their stay in the Medical College and be treated as on duty with full pay. Such an avenue for upgrading medical assistants to doctors will act as an incentive for attracting better quality candidates to training as medical assistant.

To make the career of a medical assistant attractive he will be given appropriate status with commensurate pay scale. There will be provision for career prospects through promotion on the basis of merit within the cadre (*e.g.* junior medical assistant to senior medical assistant) so as to attract trainees of better calibre and provide incentive for improvement in the quality of work.

When a medical assistant has been trained he must be expected to be absorbed in a suitable position in the country's medical system and must be allowed to exercise the functions for which he has been trained. This implies creation of positions in the administrative structure, definition of career prospects, of a chain of command, and relationship with other members of the health team. His professional responsibilities and his right to exercise them with a reasonable degree of independence need to be clearly laid down.

In view of the acute shortage of doctors the programme for training Medical Assistants will be given high priority during the First Five—Year Plan period. It is estimated that the cost of the programme during the Plan period will be Taka 3·00 crore with a foreign exchange component which is one-third of the total.

C. *Training of Nurses*

Basic Nurses.

The Nursing Services of the country is extremely weak. At present there are only about 700 trained nurses distributed throughout the country. With 7,000 doctors this gives a Doctor/Nurse ratio of 10 : 1, compared to 2-5 nurses to 1 doctor in any developed country.

The reasons for this acute shortage of trained nurses are many. Firstly, there is a socio-cultural barrier to our women's taking up nursing as a profession. Secondly, there has been absence of initiative in attaching priority to developing well-organized training facilities for Nursing. Thirdly, there is want of real effort to make the nursing profession attractive to the potential trainees. The few existing nurses' training centres suffer from want of adequate residential facilities, training equipment, library facilities and even teaching staff. The status of nurses in the hospitals and other institutions is ill-defined, often leaving the nursing personnel without pride in their profession commensurate with their responsibility for and contribution to the care of the sick.

During the Plan period nurses' training programmes will be developed on a priority basis. Permanent Nurses' Training Centres (NTC) will be established with sufficient residential accommodation, adequate staff and teaching facilities in all the Medical Colleges where a N T C does not now exist at the moment.

In addition, existing training centres will be improved and expanded. This will also improve the nursing services of the medical colleges hospitals, as the trainee nurses while taking their hospital training, will supplement the present grossly inadequate nursing staff.

The status and salaries for the different cadre of Nursing Services will be enhanced. In the hospitals nurses will be given their due position and respect as equal partner of the "Doctor-Nurse Team" in the treatment of patients. When the nurses are placed in a position of esteem within the hospital (which is lacking now) they will soon be given the same respect by people outside the hospital.

In consultation with the National Nursing Council a "Condensed Course" training programme will be arranged to convert the matriculate "Nursing attendants", who have already served for at least four years, to basic nurses.

The on-going scheme of "Crash Programme for Training of Nurses" shall be implemented with all seriousness to produce as many basic nurses as possible. Some of the training centres organised under this programme, which will be found to be satisfactory on the basis of performance, will be developed as permanent training centres in due course.

During the year 1972-73 the total intake capacity of Nurses' (Basic) Training Institutions, including the Crash Programme is 775 as shown in Table XV-10.

TABLE XV-10

Regular Training Facilities for Basic Nursing (1972-73).

Nurses (Basic).		Lady Health Visitors.		Midwives.	
Institution.	No. of intake annually.	Institution.	No. of intake annually.	Institution.	No. of intake annually.
NTC, DMCH ..	150	LHVTC, Azimpur	50	Crash Programme	170
NTC, RMCH ..	50	LHVTC, Rajshahi	20		
NTC, CMCH ..	50	LHVTC, Barisal	45		
NTC, MMCH ..	50				
NTC, Mitford ..	25				
16 Centres under Crash Programme.	450				
Total ..	775		115		170

Expansion of the training programme by opening Nurses' Training Centres in the remaining four Colleges during the plan period will help increase the intake of students. Since, however, the facilities will have to be created gradually and since the course is for four years, the increase in actual output of nurses will be available only in the next Plan period. The position during the Plan period regarding the intake and production of qualified Basic Nurses is given in Table XV-11.

TABLE XV-11

Expected intake of Students for Training in Basic Nursing and output of Basic Nurses (1973-78)

Year.	Intake capacity (expected).	Output of Nurses (Basic).	
		Actual Number.	Cumulative Total.
1973-74	775	215	215
1974-75	900	157	372
1975-76	1000	64	436
1976-77	1200	620	1056
1977-78	1200	620	1676

*Calculated as 80 per cent. of actual intake; loss due to drop-outs and failure being 20 per cent.

Thus it is estimated that during the plan period a little over 1600 basic nurses will be produced with an appreciable increase of training facilities for Nurses' training programme. The main effect of the increased facilities however, will come during the next Plan period.

To produce teachers for the NTCs. and LHV Training centres, the existing post-basic college for nurses which is being run on make-shift basis has to be fully developed as a permanent full-fledged institution as quickly as possible. The teaching staff, students' hostels, equipment and apparatus, library and other physical facilities will have to be provided in well-planned buildings to ensure effective training.

D. *Training of Para-medical Personnel*

The shortage of all categories of para-medical personnel is also acute. In fact, the total number of para-medical personnel is less than that of qualified doctors. In developed countries each doctor on the average works with 6 to 10 para-medical workers. During the Plan period a priority programme will, therefore, be undertaken for producing a large number of Para-Medical Personnel to improve the effectiveness of the health services.

The intake of students in different disciplines of all para-medical training schools will be flexible and guided by actual requirement in the health services. The syllabus of the various courses will be recast completely and will be biased towards practical and field work rather than theory. After a core course in each discipline, the trainees will be distributed to relevant institutions to learn their "trade" on the job.

In the present system, there is uncertainty about employment and promotion-opportunities. This adversely affects both recruitment to the para-medical institutes and increases the drop-out rate. Efforts will now be made to attract students with better educational background, making each category of para-medical personnel an attractive cadre with prospects for promotion depending on qualifications and performance.

At present, the only functioning para-medical training institute is at Dacca. One more Para-medical Training Institute has been constructed at Rajshahi and is in the process of being manned and equipped. It is expected that the Institute at Rajshahi will start functioning in the year 1973-74. During the Plan period a third Institute will be established.

As for training of Lady Health Visitors (LHV), four new Lady Health Visitors Training Centres (LHVTC) will be established during the Plan period in addition to strengthening and expansion of the existing three LHVTCs with a view to meeting the requirement. Moreover, due to integration of Family Planning with Health Services the existing four Training cum-Research Institutes of the Family Planning programme can be conveniently used for training LHVs.

A number of crash programmes will also be introduced during the Plan period to tackle the problem of shortage of different categories of para-medical personnel. The situation regarding para-medical personnel has been shown in table XV-12.

TABLE XV-12

Estimated output of Para-Medical personnel during the Plan period (1973—78)

Category of personnel.	Existing, 1972-73.	Estimated output during the Plan period.	Target 1977-78.
1. Sanitary Inspector	980	1,240	2,220
2. Compounder/Pharmacist	1,500	2,000	3,500
3. Laboratory Technician	270	1,500	1,770
4. Radiographer/X-Ray Technician	130	370	500
5. Blood Bank Technician	20	250	270
6. Radiotherapy Technician	10	250	260
7. Physiotherapy Technician	20	250	270
8. Dental Technician	20	250	270
9. Lady Health Visitor	800	3,200	4,000
10. Midwife	250	500	750
11. Multipurpose Basic Family Welfare Worker ...	Nil	25,000	25,000

15.1.13 Utilization of Manpower

(i) Production of manpower will be planned on the basis of the fullest possible utilization of all available medical, nursing and para-medical personnel. This will be ensured by well-planned production of manpower and the timely creation of suitable job opportunities. Effective use of available manpower will be facilitated by prescribing appropriate emolument, status, housing facilities and other privileges.

(ii) Development of high level medical specialities must reflect the requirement of the national health programmes and not only the doctors' individual prefcrences to this end. A flexible system of subject-wise quota for post-graduate training of doctors will be instituted strictly on the basis of actual requirement and priority.

(iii) All doctors, medical assistants, nurses and para-medical personnel after qualifying from the respective National Training Institutions will be compulsorily required to serve for, at least, two years in the national health programmes, of which at least one year must be in the rural areas. One year's service in rural areas will be a required condition for crossing efficiency bar, for promotion and for post-graduate studies within the country or abroad. Posting of personnel in rural areas will be made, as far as practicable, early in the career and suitable residential accommodition will be provided.

15.1.14 Pharmaceutical Industry and Quality Control of Drugs

The Pharmaceutical Industry has grown in unplanned way without proper attention to the need to make the country self-sufficient in essential drugs. Many so-called manufacturers are engaged in bottling drugs imported in bulk, acting indirectly as the sales agents of foreign firms. Basic pharmaceuticals are produced by very few manufacturers. Quality control of drugs is inefficient and spurious drugs are quite common. This situation will be improved through adoption of the following measures:

(i) Licences and financial incentives for manufacture will be given only for manufacture of basic and essential pharmaceuticals and only to those manufacturers who can provide both the financial and technical resources to operate such an industry.

(ii) The requirement of each basic and essential pharmaceuticals will be assessed prior to the issue of licences and extension of financial and other incentives to qualified manufacturers. The aim would be to achieve self-sufficiency in the basic and essential pharmaceuticals on priority basis.

(iii) Initially the Pharmaceutical Industries will be required to manufacture only those Pharmaceutical products including basic chemicals which are required to meet the internal demand in the country. Once self-sufficiency is achieved, manufacture of pharmaceutical and chemicals may be geared up for exports.

(iv) An effective mechanism will be developed to check and recheck for quality of all pharmaceuticals and chemicals produced by the industry. Each industrial concern will be required to have a quality control laboratory with adequate equipment and staff for examining their own products. They will be required to maintain records of such examination for verification whenever necessary. Manufacturers cannot release any substandard product for distribution under any circumstances.

(v) The present machinery for quality control will be re-organized as follows:

(a) The licence giving authority will be separated from the authority concerned with quality control.

(b) Quality control of pharmaceuticals will be enforced by regular collection of random samples at different points (*viz*, from the firms, distributor and drug stores) for testing at the drug control laboratory of the Government.

(c) Appropriate action will be taken if the results of tests significantly differ from those maintained in the records of the manufacturer, by fixing responsibility at the relevant point.

(d) The existing Government Drug Control Laboratory will be expanded and strengthened with physical facilities, supplies and trained scientific and technical staff to cope with the large number of tests to be performed.

(vi) Drug Licensing and Drug Control Acts will be reviewed and amended.

15.1.15 Mobilization of Resources

Health care is a basic right of every citizen, funds allocated for the health programme are in no sense "non-productive". Government is committed to arranging health care for all. Free health care must be provided to the poor and needy, who cannot pay the cost, but where possible and practicable the cost for providing health care will be recovered directly from those who can afford to pay.

A. *Health Insurance Scheme with Contributions by Employers*

A comprehensive health insurance scheme will be implemented in which the Government and the employer will be at the paying end and the employees mainly at the receiving end. The scheme will have to be implemented in a phased manner, starting with specific categories of employees and gradually extending to give 100 per cent coverage. Private employers will have to be included in the scheme and made to pay their contribution, if necessary, by enactment of appropriate laws.

Until the Health Insurance scheme is organized expenditure on medical allowances to employees may be reorganized in a more rational way to ensure that they really obtain all that they need. The present system of disbursing full medical allowances at a flat rate of say 15 taka per month to each employees of certain categories most often leads to the money being spent for purposes other than health care.

If every Government, industrial or private employer were to contribute at a flat rate of 15 taka per month per employee for providing health care, an amount of Taka 4·5 crores would be accumulated per month, generating Taka 50-60 crore annually. This is more than double the total expenditure incurred at present by the Government under revenue and development heads combined. Such a financial resource could provide a solid base for development and maintenance of a permanent, well-planned, comprehensive and free health care facility for all the employees and their families replacing the patchy and incomplete health care which they now enjoy. In addition, a surplus would be available for implementation of other programmes in the Health Sector.

B. *Paid Service Through Poly-Clinics*

Paid and free services must be separated. All paid services will be abolished from Government Medical Institutions in order that all patients will receive equal care and attention in each Public Institution. But those who can afford to pay, will have to bear the full cost of services. This can be achieved gradually by setting up Poly-Clinics to provide paid services.

Initially such a scheme will be introduced in the urban areas. The Government will provide buildings and equipment for each such clinic. They will remain the property of the State but will be managed by Boards formed by the Government on a self-supporting basis. The Board of each clinic will appoint its own Doctors, Nurses, Consultants and other staff and pay them from the income of the clinics. Funds for subsequent improvement and expansion must be provided from the surplus income of the clinic. Surplus income may also be

utilized for setting up new clinics or for other health programmes. Thus these clinics will involve only capital investment out of public funds, without any recurrent expenditure from the Government. In due course they may generate funds for expansion and improvement of health facilities.

15·1·16 Administration

The existing administrative system needs to be reviewed with a view to making it more effective:

(a) There is a strong need for decentralization of both administrative and financial powers and responsibilities, both in order to facilitate implementation of the development programmes and to improve routine work.

(b) Existing procedures for release of funds to the agencies concerned for development work have to be streamlined.

(c) The Planning Cell of the Ministry of Health will be reorganized, and staffed with experienced officers and supporting personnel for planning and implementation of development projects.

(d) The Government will consider the establishment of a National Health Council with respresentatives from Government, National Medical and Public Health Associations and other representatives under the Chairmanship of the Health Minister. Such a National Health Council would be responsible for recommending major health policies and programmes. One objective of such a Council would be to ensure that a people-oriented health programme is formulated.

15·1·17 Financial Allocation and Priority

In the past, financial allocations for development of the health sector have been woefully inadequate. The situation was further aggravated by failure to release even the funds allocated. Moreover, whenever general financial constraints were imposed, they affected Health more than any other sector.

The allocation in the First Five-Year Plan for the health sector has been set at Tk. 200·00 crore (excluding the Family Planning Programme). While it is a major improvement on past allocations, it allows for only a modest programme.

A major portion of the plan allocation (Tk. 170·00 crore) will be required to complete most of the on-going schemes. However, funds are also available (Taka 30·00 crore) for implementing new programmes.

In drawing up the plan financial priority has been given to:—

1. Rural Thana Health Complexes including 25 bed hospitals in each Rural Thana.
2. Provision for raising the number of hospital beds and improvement of hospital facilities.

3. Improvement of man-power by providing training and teaching facilities (both at under-graduate and post-graduate levels) for doctors, nurses, medical assistants, and para-medical personnel.

4. Vastly improved programme for M.C.H. both in rural and urban areas.

5. Eradication/Control of infectious diseases including tuberculosis and improvement of production of immunizing agents.

6. Introduction of health programmes for industrial workers.

7. Improvement of drug control, drug research and drug distribution.

15·2 SOCIAL WELFARE

15·2·1 Introduction

In the past the Social Welfare Sector was neglected. The welfare programmes were in operation mainly in the urban areas. A limited amount of assistance was given to the physically handicapped children needing protection and some voluntary organizations involved in social welfare work. The war of liberation has aggravated the social problems by creating thousands of dishonoured and destitute women, orphan children, disabled men and women. The normal social life of millions of families has been affected adversely in one way or another. Thus on top of the already existing numerous social problems we have to cope with those created by the War of Liberation.

15·2·2 Programmes in the Pre-Liberation Period

During the period 1955-60 only 34 thousand taka were allocated to Social Welfare Sector in Bangladesh. In the subsequent periods the allocations were gradually increased. However, the funds allocated always fell far short of actual requirements and whatever allocations were made were seldom fully utilized. The allocations and utilization of funds for the period from 1960-70 are given below:

(Taka in crore.)

Period	Programme Allocation	Budget Allocation	Amount utilized
1960-65	2·856	2·130	1·600
1965-70	6·000	2·104	1·495

The above table shows that although there was steady rise in the allocations for the programme in succeeding periods there was virtually no rise in actual allocations. Only Taka 0·25 crores were allocated for this sector for the period June 1970 to December 1971.

In addition to shortage of funds the programmes suffered and fell far short of targets due to slow utilization of whatever meagre funds were allocated. In fact only 74 per cent of the

actual allocation was used during the entire period under review. Rate of utilization was adversely affected due to the following reasons :

(a) Absence of a Planning Machinery in the Ministry of Social Welfare and the consequent lack of sufficient number of viable projects.

(b) Delay in release of funds due to administrative bottlenecks.

(c) Lack of sufficient authority on the part of the implementing agencies to acquire necessary physical facilities in time.

15·2·3 Need for a Policy

It is necessary to adopt social welfare programmes for the benefit of those sections of the community who are unable to find a place for themselves in the society unaided by the government, voluntary organizations or philanthropists. Unless appropriate measures are taken a social misfit is not only a burden to the society but may turn out to be a threat to the social fabric. Thus social welfare has two important facets. First, the positive aspect, that is, to improve the existing social environment. Second, the negative aspect, that is, to protect the existing social order from the threat of disruption or from being burdened by those members of the society who cannot satisfy the social needs on their own.

While the first aspect of social welfare involves almost the entire efforts of the state machinery, *viz.*, law and order, food, health, education, housing, communication, industry, etc., for the benefit of the vast majority of the people in the country, the second aspect of social welfare has often been pushed behind and lost sight of since it involves minority groups. But the unfortunate minority who cannot attain the social norm and does not fulfil the social needs either temporarily or permanently, is also an integral part of the society. For the benefit of the society itself, if not for anything else, this minority group must be taken care of.

In view of this there is a need for formulating a clear-cut policy of Social Welfare in the socio-economic Plan of the country. It is due to the lack of specific policy that this sector has been so poorly treated in matters of national planning. Since the First Five-Year Plan is being prepared in the background of socio-economic disruptions caused during the war of liberation and since social justice has been set as a goal in the Constitution of the country the need for an appropriate policy in this sector has become all the more urgent.

15·2·4 Objective

(i) To help the communities to meet their basic social needs.

(ii) To help all physically, mentally and economically handicapped members of the society to overcome their handicaps and become useful citizens.

(iii) To arrange rehabilitation of the victims of Pakistan Army of occupation and other natural disasters like cyclone, tornado and land erosion, etc.

(iv) To organise child care programme for the development of "Children without care".

(v) To provide opportunities to the youth of the country to be of service to the society.

(vi) To help individuals with specific socio-psychological problems like drug-addicts, frustrated and withdrawn who without such help cannot make positive contribution to the society.

15·2·5 **Strategies**

(i) Social Welfare programmes so far introduced in the country is urban biased. Steps will be taken to change this trend and programmes of this sector will be reorganized to extend the services to the rural areas to create dynamic rural communities by infusing the concept of self-help. This will require collaborative efforts of social welfare sector and other socio-economic sectors like Health, Education, Housing, Communication, Employment, Population Control and Rural Development. It is visualized that by such coordination efforts a new healthy social order will emerge in rural communities. This will also help to prevent migration of rural population to urban areas.

(ii) Urban Communities in spite of the on-going urban social welfare programmes are still continuing to suffer from various social maladies. This indicates that the urban social welfare programmes are to be revitalized, strengthened and speeded up.

(iii) The strength and weaknesses of the social welfare programmes will be evaluated to determine the manner in which the programmes could be made more effective.

(iv) Private social workers and organisations will be encouraged to participate, in a co-ordinated manner, in social welfare programmes as envisaged in the plan.

(v) Financial grants by the government to the private social welfare organizations will be restricted to the minimum and will be allowed only where actual performance and real need justify. This restriction will be imposed to curb the growth of mushroom organizations, to create the concept of self-help in the community and to generate the willingness and real sense of social service in the workers and the organizations.

(vi) The destitute women and children need urgent and massive help for their Social and Economic rehabilitation. Social Welfare measures in this sphere have already been taken up and will be strengthened and speeded up.

(vii) The services for physically handicapped children, men and women, like blind, deaf and dumb, etc., need further augmentation to give wider coverage. Efforts will be strengthened in this field by improving the existing service facilities and creating new institutions.

(viii) Adequate programmes will be formulated to enable the youth to take part in socially constructive activities.

(ix) Necessary training facilities for the man-power required to support the Social Welfare Programmes will be provided and the administrative facilities for executing the programmes will be improved.

15.2.6 **Physical Targets**

Physical targets for social welfare sector for the first Five-Year Plan (1973-78) are given in the Table XV-13.

TABLE XV-13.

Benchmark and Physical Targets for the First Five-Year Plan

Sl. No.	Programme.	Benchmark 1972-73.	Expected increase during the Plan period.	Physical Targets for the First Plan (1977-78).
		Units.	Units.	Units.
1	Community Development and Rural Social Services	Nil	466	466
2	Social Welfare Services for the victims of war of liberation	40	22	62
3	Medical Social Work	Nil	42	42
4	Social Welfare Administration and Policy	Nil	24	24
5	Social Welfare Services for Children ..	11	27	38
6	Social Services for the Physically handicapped	11	10	21
7	Social Welfare Services for Youth ..	7	13	20
8	Social Welfare Services for the Delinquents and Criminals	Nil	8	8
9	Professional and Financial Assistance to Voluntary Social Welfare Agencies	..	..	..
10	Social Welfare Training	Nil	1	1
11	Social Welfare Research and Publication ..	Nil	1	1
12	Social Welfare Services for the Vagrants and Destitutes	Nil	8	8
13	Social Welfare Services for Old and Infirm ..	Nil	2	2

15.2.7 **Major Programmes**

A. *Rehabilitation of War Affected Destitute Women and Children*

A number of social welfare agencies including the social welfare department of the Government of Bangladesh initiated programmes to rehabilitate the unfortunate and helpless women and children after the war of liberation. The on-going Government Programme for Care, Protection, Education, Training and Rehabilitation of Orphans and Destitute Women which was started during 1972-73 will continue during the Plan period. Altogether 62 units of the

programme will be established all over the country at a total cost of Tk. 25·4736 crores. An amount of Tk. 0·9454 crores has already been spent and it is envisaged that during the Plan period a sum of Tk. 13·9802 crores will be utilized leaving Tk. 10·5480 crores for the next plan period. Of the proposed total plan out-lay of Tk. 20·0000 crores for both on-going and new programmes in the Social Welfare Sector during the plan period the expenditure of Tk. 13·9802 crores for this programme shows the importance which the Government attaches to the problem of destitute women and children.

Jatiya Nari Punarbasan Board, an autonomous organization, and several voluntary organizations are also working in this field. Attempts will be made to co-ordinate the activities of all the agencies for maximizing national benefit.

B. *Social Welfare for Children*

(i) *Care of the orphans*: Inspite of best efforts to rehabilitate children there will always be some orphans who will need total care in an institution. This will need services rendered through orphanages. Hence the on-going programmes in this field will continue during the Plan period. However, the services in this respect will be strengthened to increase the coverage.

It is envisaged that the remaining work for the on-going schemes will be completed during the Plan period involving an expenditure of Tk. 15·75 lakhs. In addition, improvement and development of the orphanages both under the government and private agencies will be taken up at a total cost of Tk. 1·4179 crores during the Plan period.

(ii) One of the social problems that have so far been left unattended in the social welfare sector is the care of abandoned children. The problem has been identified now and needs immediate attention. Otherwise these children, mostly under the age of five, will either meet premature death or be forced to become beggars. Quite often they grow up to become law and order problem. As an initial exploratory measure work for starting two baby homes to take care of the abandoned children will begin during the Plan period at a total cost of Tk. 15·40 lakhs.

(iii) Establishment of one Day Care Centre will be started during the Plan period at a cost of Tk. 10·00 lakhs. This scheme will be taken up with a view to helping the potential working mothers who are unable to join the work force unless some arrangements are made to take care of their children during the working hours.

C. *Social Welfare for Youth*

In addition to on-going programmes which will involve an amount of Tk. 2·00 lakhs ten youth hostels and youth welfare centres will be improved in the Plan period at a cost of Tk. 10·00 lakhs to harness the youth energy for development of the country.

D. *Social Welfare for Physically Handicapped*

That physically handicapped people like blind, deaf and dumb of our country can become useful members of the society inspite of their handicap has been amply proved by the results obtained by providing teaching and training facilities to these people through existing

schools and training and rehabilitation centres. Hence the on-going programmes which include four educational and rehabilitational schemes will be completed during the Plan period at a cost of Tk. 27·49 lakh. In addition one school for Deaf and Dumb and one school for the Blind will be established at a cost of Tk. 100·18 lakh during the Plan period.

E. *Social Welfare for Beggars*

Beggary destroys the sense of human dignity. The number of beggars in the country seems to be growing fast. The solution of the problem is not easy. The problem has to be tackled by a two-pronged attack. First, by rehabilitating the beggars with necessary training in useful trades so that they can earn their living and secondly, by eradicating the causes that lead these people to accept such a degrading profession. The first measure although palliative has produced good results as has been found from the existing training and rehabilitation centres in spite of inadequate facilities. Hence two vagrant and beggar homes will be developed further to improve the quality and quantity of services rendered through them at a total cost of Tk. 25·00 lakh during the Plan period.

F. *Social Welfare for Delinquents*

A programme for probation and after care services which had been started before this plan period will be completed.

G. *Social Welfare for Old and Infirm*

One home for the old and the infirm will be started during the plan period at a cost of Tk. 10·00 lakh as an initial effort in this field.

H. *Medical Social Work*

While medical social work is an integral part of Health and Social Welfare Services in all developed countries, in Bangladesh only 18 centres are functioning with restricted facilities. To improve the situation the existing centres will be further developed and 24 new centres will be created to strengthen the services in the Plan period at a total cost of Tk. 14·56 lakh.

I. *Professional and Financial Assistance to the Voluntary Social Welfare Agencies*

Performance of all the agencies which are now receiving assistance from the Government and which will request for assistance in future will be evaluated before any new assistance is given. This is necessary to achieve optimum results. A sum of Tk. 15·00 lakh has been kept in the Plan as assistance to the Diabetic Rehabilitation Centre, Dacca.

J. *Social Welfare Administration*

Some of the drawbacks of the existing Govenmental organization for administering social welfare services are due to lack of adequate personnel, office accommodation and other supplies. The organisation needs reviewing for streamlining and the physical facilities are to be strengthened. Schemes for this purpose will be introduced in the Plan period at an estimated cost of Taka 30·00 lakh.

K. *Social Welfare Training for creation of Man-power*

The on-going schemes of College of Social Welfare and Research Centre will be completed during the Plan period.

L. *Community Development Programme*

Rural development programmes have been taken up by the Government. Highest priority has been attached to the rural development programme in all sectors for increasing social welfare of rural people through community development works. In the social welfare sector a scheme entitled "Pilot project for extended rural social upliftment" will be introduced at a cost of Tk. 90·00 lakh during the Plan period to further this aim.

In urban areas, however, community development efforts will be supplemented by a special programme under the social welfare sector and 16 new Urban Community Development Centres will be started during the Plan period at a cost of Tk. 17·00 lakh.

15.2.8 Administrative Organisation of Social Welfare

The existing Social Welfare Organization which was set up in the sixties needs reviewing. The responsibilities of the organization have grown manifold by now due to establishment of many new Institutions to provide services. But even after more than 10 years almost the same set-up is being continued. The existing organization is not, therefore, able to cope with the ever-increasing responsibilities. Whenever attempt was made in the past to strengthen the set up it was dropped on the ground of financial constraint by the then colonial rule. This has not only prevented the existing institutions from giving their best but at the same time also given rise to a feeling that this is an unimportant sector.

Social Welfare Administration of the Government often fails or becomes only partly successful in implementing some of the Social Welfare measures due to lack of support by necessary legal provisions. In view of this collaborative efforts between the Social Welfare and Law Ministries are called for immediately to make such legal provisions as are essential for the success of National Social Welfare Programmes.

15.2.9 Financial Requirements

Financial implication of the programmes has been summarized in the Table XV-14.

TABLE XV-14.

Financial Requirements for First-Five Year Plan in Social Welfare Sector.

(*Taka in crore*)

Status of Schemes	Total Cost	F. E. C.	Expenditure up to 1972-73	First Plan allocation	
				Total	F. E. C.
On-going	28·0583	0·0355	2·6020	15·0286	0·0215
New	9·6829	0·1460	..	4·9714	0·1460
Total ..	37·7412	0·1815	2·6020	20·0000	0·1675

Total allocation of Taka 20·00 crores for development efforts in Social Welfare Sector for the Plan period is not very large. The allocation for this sector has been kept at this level in view of limitation of funds and large demands of directly productive sectors and not because of lack of appreciation of the needs of this sector. An expenditure of Taka 20·000 crores will, however, mean a 1,400 per cent increase in outlay compared to that in 1965-70. The experience gained during the First Plan period will help to adopt an accelerated programme during the subsequent Plan periods.

CHAPTER XVI

POPULATION PLANNING PROGRAMME

16.1 PRESENT DEMOGRAPHIC PICTURE IN BANGLADESH

The population of Bangladesh, according to 1961 census, was 5·28 crores. It has been growing at a very fast rate and the estimated population in January 1973 was 7·40 crores. The present estimated rate of natural increase is as high as 3·0 per cent with birth and death rate of 47 and 17 per thousand respectively. Growing at this constant rate the population will double in 23 years and by 1996 the population density would be 2680 persons per square mile. At present nearly half the population is under 15 years. With the present high rate of population growth the percentage of dependent population will further increase aggravating the already unfavourable population structure. Such a high dependency ratio is not conducive to the growth of the economy as it will neutralize much of the gains obtained due to development efforts.

The present high rate of growth of population is likely to continue unless radical preventive steps are taken. There are about 1·40 crore women of child-bearing age, 70 per cent of whom are fertile and exposed to the risk of pregnancy, and 20 per cent of them are pregnant at any given time of the year. At the end of the plan period the number of women of child-bearing age will be well over 20 per cent of the total population. About 65 per cent of these women will be under 30 years of age with many reproductive years ahead.

This growth rate and the age-characteristic of our population, specially that of women of child-bearing age, suggests that we must critically review our past programmes for population control and formulate a set of bold and, if necessary, drastic policies for vigorous action with a view to reducing this high rate of population growth within a reasonable time. Failure in this critical area would frustrate all our development efforts. Therefore, the programme for population planning is given a place of high priority in the development plan.

16.2 ACHIEVEMENTS AND WEAKNESSES OF THE PAST PROGRAMME

A. *Achievements*

(*i*) The major impact of the programme is the awareness (regarding Family Planning Programme and availability of modern contraceptive methods) that has been created in about 85 per cent of the target population (couple with wife 15-44 years of age) despite the high rate of illiteracy and high degree of conservatism amongst the people.

(*ii*) An extensive organisational structure has been built up which can be utilized to launch an improved programme based on newer strategies.

(*iii*) An environment conducive to fertility control programmes has been created as a base so that, in addition to a family planning programme, a number of non-family planning measures can be gradually introduced in an attempt to control population growth.

B. *Weaknesses*

Although the awareness was created in 85 per cent of the target population only about 5-8 per cent of them became adopters. This large gap between awareness and acceptance points to the weaknesses of the programme which can be summarised as follows:

(i) Unrealistic targets in the absence of intensive supervision led to fictitious reporting and abuse of incentives which were given in cash. Case-wise on-the-spot incentive payment both to the clients as well as to the family planning workers led to monetary corruption distorting the programme perspective.

(ii) Programme strategy was limited mainly to clinical methods, *viz.*, IUD and Vasectomy without a mechanism of follow-up, and non-clinical contraceptives like pills and condoms were almost completely neglected.

(iii) Lack of a well-defined population policy could not give the programme a solid base to widen the programme perspective in respect of non-family planning strategies for population control and kept it restricted to birth limitation efforts instead of making it an endeavour for all-round family welfare.

(iv) There were a number of drawbacks in the organisational structure. First, the field motivators were part-time, illiterate and untrained. Second, there was a conflict between supervising staff (*e.g.*, District Family Planning Officer and Technical Officer) due to lack of defined responsibility and authority. Third, a number of independent directorates at the centre were creating problems of coordination leading to ineffectiveness of the action programme.

16.3 THE POPULATION PROBLEM

Even if Bangladesh were able to achieve a zero population growth rate in 30 years requiring a drastic reduction in fertility, which no other country has been able to achieve in such a short period of time, the population will double to over 15·0 crores by the turn of the century. If, however, there is no reduction in fertility, the population will grow to 21·0 crores by the year 2000.

Demographic projections based on four different rates of reductions by the year 2003 indicate the necessity of immediate adoption of drastic steps to slow down the population growth rate. Under the assumption of drastic reduction in fertility the population of Bangladesh is projected to reach 15·5 crores, while with no reduction it will reach 22·9 crores. Under the assumption of substantial reduction and moderate reduction the population is projected to be 16·9 and 18·9 crores respectively.

The man-land ratio in Bangladesh is already one of the highest in the world. The present 3 per cent growth rate of its population will double it in 23 years and treble it by the beginning of the next century. Even a doubling of population on the limited land space of Bangladesh is a disturbing prospect. A trebling of the population is simply frightful to visualise.

As population grows on a more or less constant land space, a number of competing demands on land are registered with increasing intensity. More land is needed to grow more food, to accommodate new factories for greater industrial production and to provide more industrial employment to the growing labour force, to provide more houses, more roads, more schools, more hospitals, more recreation space, and so on. Even without a growth in population the demand for land goes on increasing to accommodate greater production activity on various fronts and to provide for the supporting physical infrastructure. All this taken into account, it is difficult to visualise the present land space of Bangladesh comfortably supporting anything near twice its present population.

16.4 APPROACHES TO POPULATION POLICY

No civilized measure would be too drastic to keep the population of Bangladesh on the smaller side of 15 crores for sheer ecological viability of the nation. For this the nation has to be mobilised, and early. The more this mobilization is delayed, the more will the possibility

of attaining the above objective by currently acceptable means recede. The first requisite is the realization of the gravity of the population problem at all levels of political leadership and the total commitment to its solution.

The first task is, therefore, to launch a major educational and motivational campaign to bring the seriousness of the population problem into public focus, and to set in motion group discussions on this problem at all conceivable levels in village panchayets, factories, schools and colleges. Simultaneously, campaigns to motivate people to adopt at least the currently acceptable measures like pills and condoms and simpler clinical methods should also be launched and group responsibilities to supervise implementation of such schemes initiated.

All political leaders, educationists, social workers and intellectuals must voice their concern strongly over the high population growth rate and encourage people to adopt measures for fertility control. This will be the most effective motivating factor.

All Ministries and particularly those which maintain regular public contact, *viz.*, Ministries of Rural Development, Agriculture, Education, Labour and Social Welfare, and Information and Broadcasting should be required to undertake family planning education and motivation programmes of their own. Their actual role in population control is described below. All voluntary organizations involved in family planning programmes or social work must be given adequate encouragement and support to strengthen their programmes for educational and motivational work for family planning.

The various students' organizations are potentially strong agents for social change. They should be encouraged by political as well as social leaders to undertake family planning education and motivation work as part of their social service programme. This will have the dual advantage of motivation of the students themselves together with the education of masses who have been observed to follow the leadership of the students.

Historically speaking, in all successful family planning programmes abortion played a central role. While keeping in mind the question of social acceptability all efforts must be made to allow this method to play its proper role in controlling the growth of population in Bangladesh.

We must consider the imposition of progressively increasing punitive measures against additional children after the second child on all couples. Once the programme gets well under way it may be worthwhile, for example, (i) to restrict ration cards in statutory and modified rationing areas to a maximum of two children, (ii) to debar couples from enjoying the benefit of fair price shops for more than two children per family. All couples should be required by law to register with family planning organization.

The first phase of launching a major educational and motivational drive, if successful, should, at least, create a climate where the possibility of more drastic measures, such as, compulsory sterilization of either husband or wife after the second child, legalization of abortion and establishment of abortion clinics for performing abortion free of cost, social measures to bring about women's emancipation etc. may be considered.

In areas where progressive leadership exists or emerges, early group resolution towards adopting the drastic measures may be forthcoming with some concentration of Government effort and support in these areas. Gradually, a climate may be created for wider adoption of such methods.

This is what we must strive for in order to survive as an ecologically viable nation. Unfortunately, the result of efforts in this direction cannot be easily quantified in advance. The best that can be done is to make periodic reviews of programmes, and, if the review warrants, to intensify efforts to reach the target of a stationary population on the smaller side of 15·0 crores in the next 25 to 30 years.

In view of the difficulty of estimating the quantitative result of the above qualitative thrusts towards population control, the various sector programmes have used a conservative estimate of the population for the First Five-year Plan terminal year (8·54 crores). This is merely to provide cushion for the per capita targets in the various sectors, and in no way constitutes any commitment for population control where an all-out social thrust must be launched.

16.5 OBJECTIVES

The plan objective is to reduce the rate of population growth, now estimated to be 3 per cent, by at least 0·2 per cent at the end of the plan period.

16.6 STRATEGIES

(i) To bring to every eligible couple the message of small family norm and family planning methods and to motivate them to become adopters through personal contacts and regular home visits by a team consisting of a male and a female trained and matriculate family health workers.

(ii) To make available adequate and timely supply of non-clinical contraceptives through programme personnel and commercial sources; to provide prompt and adequate clinical services for family planning at the clinics/hospitals with ensured follow-up.

(iii) To include non-family planning measures within the scope of the programme with a view to broadening its perspective and aim towards population planning thereby making it an integral component of the total development effort.

(iv) To maintain close collaboration and co-operation with other agencies and sectoral development programmes with a view to enhancing the effectiveness of the population planning programme.

(v) To establish an organisation with powerful leadership consistent with high national priority in respect of population control thus allowing development of truely comprehensive population planning programme and its implementation.

16.7 POPULATION PROGRAMME

A. *The goal of the Programme*

The following table presents the population estimates under two assumptions: (i) without population planning programme and (ii) with population planning programme. It has been envisaged that at the end of the plan period the crude birth rate shall come down to 43 from the present 47 per thousand population with linear decline of crude death rate from the present 17 to 15 per thousand population.

TABLE XVI-1

Estimated Population with and without Family Planning Programme, 1973-78

Year.	Population without Family Planning (in crore).	Population Characteristics with Family Planning.			
		Crude Birth Rate.	Crude Death Rate.	Rate of Natural Increase.	Population with Family Planning (in crore).
1	2	3	4	5	6
1973-74	7·62	47	17·0	·0300	7·62
1974-75	7·85	46	16·5	·0295	7·85
1975-76	8·09	45	16·0	·0290	8·09
1976-77	8·33	44	15·5	·0285	8·31
1977-78	8·58	43	15·0	·0280	8·54

B. *Information, Education and Motivation*

Keeping in view that motivation by part-time illiterate female *dais* and male motivators under the past family planning programmes was not successful, it has been decided that strategy of motivational efforts will be revised and strengthened by involving all relevant Ministries.

(i) Ministry of Health and Family Planning : Continuous motivation and supply of family planning materials and services will be maintained through couple registration by health and family welfare multi-purpose field workers. A team consisting of one male and one female worker who will be matriculate and trained for the job will be employed as regular government employees under the programme of Integrated Thana Health and Family Planning Complex for health and family planning education and motivation for each 8000 population. The family planning programme would be integrated with Health Services for face to face motivation, delivery of services and follow-up.

(ii) Ministry of Rural Development will develop women cooperatives for increasing their employment potential by functional literacy and education including family planning.

(iii) Ministry of Education will introduce population education in curricula of educational institutions at all levels and in the programme of adult education.

(iv) Ministry of Agriculture will incorporate family planning and nutrition education in agriculture extension programmes.

(v) Ministry of Information and Broadcasting will have programmes for dissemination of information regarding population problem and family planning through all mass media including Radio, T.V., Newspapers, Posters, Pamphlets, etc.

(vi) Ministry of Labour and Social Welfare will take up education, information and motivation on population and family planning through relevant social work programmes.

Funds will be allocated to each Ministry against specific schemes by the Planning Commission. The concerned Ministries will be responsible for implementing their schemes under respective administrative control within the limits of scheme-wise fund allocations. However, all population programmes will be coordinated by the Population Planning Division to be set up under an appropriate ministry.

C. *Target Population*

Although all eligible fertile couples will be the target population for continuous motivation programme, major emphasis will be given to couples where the wife is under 30 years of age. About 65 per cent of all fertile women belong to age group 15—30 years contributing about 82 per cent of all births. These women, in general, are highly fertile and are yet to complete their family size. Real impact on the growth rate of population can be produced only if these women become acceptors of family planning methods. Specific efforts will, therefore, be applied to motivate these couples so that they plan their family size to a limit of 2 children by spacing pregnancy initially through adoption of contraceptive methods of their choice followed by adoption of a more permanent method to stop any further pregnancy when they have 2 children.

It is known that women who are over 30 years of age, married for longer period of time, with 3 or more children are more likely to be motivated to become acceptors as they are under social, economic, medical and psychological pressure due to too many children. It is, therefore, logical that these women would be the second target group for the programme. Their importance lies in the following facts:

(i) Due to their susceptibility to motivational efforts the *initial decline* in the fertility of the population may be achieved quicker due to their quicker conversion as adopters.

(ii) In our society, specially in rural areas where vast majority of our population live, younger women are under powerful influence of older women in their personal and social behaviour. Therefore, if women of this age group become acceptors the younger women will be provided with the much needed social support and encouragement for adopting family planning methods.

D. *Supply and Service*

Once a person is motivated to accept family planning methods he/she must be promptly supplied with contraceptives or clinical services according to his/her choice to ensure continued practice of family planning methods. Hence, supplies and services will be ensured as follows:

(i) Non-clinical supplies

Supplies for non-clinical methods will be provided through family health workers, sale agents and commercial sources.

(ii) Clinical Services

Clinic based programme for family planning will be arranged in all hospitals including Medical College Hospitals, District and Subdivisional Hospitals, Rural Health Complexes and Mission and Red Cross Hospitals. In addition, all the Maternity and Child Health Centres and Lady Health Visitors' Training Centres will provide clinical services and will supply conventional contraceptives to acceptors.

(iii) Follow-Up

All clients accepting family planning methods will have follow-up services to promptly institute treatment for complication, if any.

Since the family planning programme is based on voluntary acceptance of contraceptive methods by the eligible couples and since the motivated acceptor will have the option to choose according to his/her need, convenience and liking, it will be the responsibility of the programme to explain the merits and demerits of all the available methods to help the acceptors to choose the most suitable methods. The methods to be offered are:

(a) Contraceptive Pills

Recent observations indicate that oral contraceptives have rapidly gained popularity in Bangladesh. In view of this the contraceptive pills will be one of the important methods in the programme. However, pills will need more active and continuous participation by clients as they will have to take pills according to a rigid schedule. Hence, frequent contacts by field workers with the clients will be required to ensure the desired participation by clients and to maintain regular supply of pills.

(b) Condoms

The use of condoms, which were neglected in the past programmes, will be given due importance in view of the fact that the recently introduced lubricated condoms have gained rapid rate of acceptance due to convenience in its use and better reliability than older type of condoms.

(c) Intra-uterine Device (IUD)

IUD as a contraceptive method has been widely used in Bangladesh. A cadre of Lady Family Planning Visitors (LFPV) has already been created and trained to insert IUD. However, in the past follow-up of IUD-inserted cases was virtually absent. As a result this useful method, which has been proved to be quite successful in many countries, did not produce the expected result in Bangladesh. To popularize the method and to produce desired results, regular follow-up of IUD-inserted cases will be required. All family planning clinics will provide facilities for IUD insertion to willing clients with ensured follow-up and treatment of side effects, if any.

(d) Sterilization

Vasectomy as a method for male sterilization and tubal ligation for females will be provided at the family planning clinics and hospitals. These methods will mainly be recommended for couples with two or more children and together should account for between a quarter and a third of total births prevented.

Based on the recent performance of the methods the estimated percentage of births expected to be prevented by different contraceptive methods is as follows:

Method	Percentage of births prevented
Contraceptive Pills	20—25
Condom	25—30
Vasectomy	20—25
IUD	20—25
Tubal Ligation	10—12
Liquid foam	10—12
Others	10—12

While fixing the targets for the various methods the following criteria have been taken into consideration:

(i) A very high percentage of the fertile couples is under 30 years of age. Many of these couples are yet to complete their desired family size and so terminal methods like vasectomy or tubal ligation will not be popular with them. To these groups pills, condoms and IUD will be the preferred methods.

(ii) Those people who are in higher age groups and/or have two or more children are likely to accept terminal methods more easily.

It is planned that along with the implementation concurrent evaluation of the programme will be carried out periodically to decide whether a shift in emphasis in favour of some method is warranted or not.

E. *Incentive*

The past system of case-wise on-the-spot payment of cash incentive for accepting a certain technique of family planning, both to the acceptor and to the family planning worker, led to corruption and inflated reporting of acceptance of various methods. Besides, this system kept the supervisory field officers deskbound in keeping accounts and making incentive disbursement. Thus the perspective of the programme was distorted and the demographic impact of the programme efforts was low. Hence a new system of incentives based on demographic impact rather than on mere acceptance will be designed for sustained and continuous adoption of family planning methods. Such incentives will include:

(i) For Clients

For vesectomy, ligation and abortion: Compensation allowance will be given for actual conveyance charge subject to a maximum reasonable amount. Services and post-acceptance treatment at hospital clinics, if required, will be ensured free of cost.

(ii) For Community

Award on zonal basis at community level, *e.g.*, priority in providing community and public facility.

(iii) For Family Planning Workers

(a) Pride of Performance certificate, (b) additional increment and (c) preference during promotion and higher training.

F. *Social and Legislative Measures*

(i) Introduction of concept of small family and courses on population problem in schools, colleges and universities.

The programme outlined above is directly oriented towards the eligible couples to limit the size of family. There will also be programmes which will be oriented towards the great mass of younger people to inculcate the ideal of small family size. One feasible and convenient measure would be to introduce the concept of small family in the syllabi of schools, colleges and universities. In colleges and universities the subject may be introduced as courses on reproductive biology, family planning, demography, etc., while in the schools syllabi would have to be developed to include the economic and social benefits of small family. Action in the educational institutions will be initiated during the plan period in co-operation with the relevant Ministries.

(ii) Raising of legal age of marriage

In the attempt to check high growth rate of population necessary steps to promulgate a law raising the legal age of marriage will be taken during the plan period in collaboration with the relevant Ministries.

(iii) Legalization of abortion

Legalization of abortion has been known as probably the best and most effective method for control of population growth. It should be seriously considered how this method can be adopted to control population growth in Bangladesh.

G. *Research*

1. Population Study Centre

There is need for population studies and research in the context of our own social and cultural setting. A Population Study Centre will, therefore, be established as a unit of Bangladesh Institute of Development Economics. This centre will undertake population studies: (a) in relation to the entire development efforts of the country involving all the sectors and (b) in relation to population control programme.

The main objectives of the centre will be:

(i) To provide information for assisting in policy formulation, programme planning, training, evaluation and data processing, communication media and material development.

(ii) To undertake basic and applied research.

(iii) To develop evaluation and measurement techniques.

(iv) To meet training needs for high level expertise so as to eliminate dependence on foreign personnel and institutions.

Relevant existing institutions including universities in Bangladesh having required expertise and research facilities will be offered funds through grant-in-aid to conduct research and training in the field of population. The Population Study Centre, however, will be the co-ordinating authority of all population research programmes.

2. Laboratory Area and Field-Trial Area

Since the family planning programme is a field oriented programme and since there are many aspects of the techniques and strategies which have not been tested under field conditions in our country it is necessary to develop a comparatively small laboratory area to initially test the techniques and subsequently put the relevant techniques to field-trial over a larger area for evaluation purposes. Therefore, one laboratory area and one field-trial area should be developed during the plan period.

H. *Evaluation*

In the past, least importance was given to actual evaluation of the family planning action programme. Under the proposed schemes, a built-in evaluation mechanism shall be provided so that assessment of both programme strategies and personnel performance is simultaneously possible. This will involve a feed-back of information by internal evaluation through service statistics, regular reporting and inspection by supervisory personnel. Also population activities of all Ministries involved in the programme will be subjected to periodic external evaluation. The Population Planning Division which will be created under appropriate Ministry will be responsible for evaluation and will devise appropriate methods and techniques for the purpose.

I. *Coordination of Population Planning Programme*

Since it has been envisaged that several Ministries and voluntary agencies will be involved in the population control programmes it will be imperative to establish a mechanism for coordination of all population programme activities in the country. While each Ministry or each voluntary organization will have its own scheme approved by the Planning Commission it is visualized that there must be a central administrative machinery to co-ordinate all these efforts so as to avoid conflicts and confusions, and ensure smooth implementation of each programme within the stipulated time to achieve the targets. This function of coordination will be the responsibility of the Population Planning Division which will be guided in its action by a Central Coordination Committee. The District and Thana Coordination Committees, however, will meet regularly to sort out the problems of coordination at their own level and, if necessary, refer the more intricate issues to the Population Planning Division for solution. The detailed mechanism for coordination, however, will be drawn up by the Population Planning Division in consultation with the central coordination committee.

J. *Training*

With the introduction of the couple registration scheme there is need of a large number of new personnel for whom training facilities must be provided for during the First Five Year Plan. Previously the four Training Institues set up at the four divisional headquarters provided training to the Lady Family Planning Visitors, but there was no systematic and planned training facilities or training materials for the action programme personnel. Whenever there was a need in the action programme for new trained

personnel training programmes were improvised. That these improvised training programmes were inadequate is obvious from the low level of basic understanding of the problem by the action programme personnel and their poor performance in the field.

The proposed Regional Training Centres, redesignated from the old Training-*cum*-Research Institutes at the four divisional headquarters will meet all the training needs of the action programme within the administrative division. These centres shall be so equipped as to be able to impart regular and refresher training courses for all categories of personnel. With the fulfilment of the initial target of training of LFPV's the centres should now be available for such a programme of training.

K. *Organization*

It is recognized that a successful population planning programme will have to be based on reduction in maternal and child mortality and morbidity as well as better nutrition on the one hand and increase in knowledge and proper education to change attitude towards family size norms on the other. Therefore, while the Ministry of Health has to play a central role in the family planning programme the success of population planning in a broader sense would depend on the co-operative efforts of the concerned Ministries. Each of these concerned Ministries will have to strengthen their capabilities for discharging their respective responsibilities in the total population programme. However, the efforts of the various Ministries and agencies involved in population programme must be effectively co-ordinated.

(i) National Population Council

A high-powered National Population Council will be formed to function as a Policy-making Body for the Population Planning Programmes. The council will be as follows:

The Prime Minister	Chairman.
Minister of Health and Family Planning	Vice-Chairman.
Minister of Rural Development	Member.
Minister of Agriculture	Do.
Minister of Education	Do.
Minister of Information and Broadcasting	Do.
Minister of Labour and Social Welfare	Do.
Deputy Chairman, Planning Commission	Do.
Member-in-charge, Population Planning, Planning Commission ..	Do.
One representative from Opposition Benches of Parliament (Nominated by the Speaker).	Do.
One representative from the Press (Nominated by the Bangladesh Federal Union of Journalists).	Do.

The Secretary, Population Planning Division, which will be created under an appropriate Ministry will act as the Secretary of the Council.

(ii) Co-ordination and Evaluation of Population Planning Activities

Co-ordination and independent evaluation of all population planning activities including the Family Planning Programme in Bangladesh can be best achieved by creating the Population Planning Division under an appropriate Ministry. While the Ministry of Health and Family Planning will remain in charge of conventional Family Planning Programme integrated with Health Services, the newly created Division of Population Planning will be responsible for co-ordination and evaluation of all the programmes relating to population planning launched by various ministries.

(iii) Co-ordination Committees

Co-ordination committees at the Headquarters and District and Thana level will be as follows:

(a) *Central Co-ordination Committee*

Minister of Health and Family Planning	Chairman.
Secretary, Population Planning Division, ...	Member-Secretary.
Secretary, Ministry of Health and Family Planning.. ..	Member.
Secretary, Rural Development	Do.
Secretary, Education	Do.
Secretary, Agriculture	Do.
Secretary, Information and Broadcasting	Do.
Secretary, Labour and Social Welfare	Do.
Director of Bangladesh Institute of Development Economics ..	Do.
Chief, Population Planning Section, Planning Commission ..	Do.

(b) *District Co-ordination Committee*

Chairman, District Board	Chairman.
Chief Medical Officer of Health/Civil Surgeon	Vice-Chairman.
District Education Officer	Member.
Project Director, IRDP	Do.
District Agriculture Extension Officer	Do.
Health Education Officer	Do.
Social Welfare Organiser	Do.
District Public Relations Officer	Do.
District Family Planning Officer	Member-Secretary.

(c) *Thana Co-ordination Committee*

Chairman, Thana Board	..	Chairman.
Thana Health Administrator	..	Vice-Chairman.
Thana Education Officer	..	Member.
Project Officer, IRDP	..	Do.
Agriculture Extension Officer	..	Do.
Circle Officer (Development)	..	Do.
Thana Family Planning Officer	..	Member-Secretary.

16·8 FINANCIAL ALLOCATIONS

The total requirement for Population Planning Programme during the First Five-Year Plan period (1973-78) has been estimated to be Taka 70 crores with a foreign exchange component of Taka 13·4 crores.

The annual estimated cost of the programme during the plan period is given in Table XVI-2.

TABLE XVI-2

Annual Financial Requirement for Population Planning Programme, 1973-78.

(*Taka in crore*)

Year	Estimated Financial Requirement	
	Total	Foreign Exchange
1973-74	7·0000	1·1184
1974-75	13·0600	1·3000
1975-76	14·5700	2·0500
1976-77	16·5850	4·0000
1977-78	18·7850	4·9316
Total ..	70·0000	13·4000

BGP-73/74-2817E—5M.