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BANGLADESH

LAND AND WATER RESOURCES SECTOR STUDY

(in nine volumes)

VOLUME VI

RURAL DEVELOPMENT INSTITUTIONS

CONTAINING:

Technical Report No. 17 - The Rural Works Programs
Technical Report No. 18 - The Thana Irrigation Program
Technical Report No. 19 - Agricultural Credit

December 1, 1972

Asia Projects Department

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Note

"The Land and Water Resources Sector Study - Bangladesh" dated December 1, 1972 was prepared between May 1971 and the summer of 1972 under the general supervision of the Bank, by staff members of the Bank, and FAO, with substantial help from consultants. The UNDP and the Bank shared the cost of the consulting services. The study is made available on the understanding that it does not necessarily represent the official position of the Government of Bangladesh or of the Bank.

The study is based mostly on data collected prior to March 1971. Although some of the information contained in the study is out of date, the essence of it is valid and it should be useful to the Government of Bangladesh and to other countries, agencies, and institutions interested in the development of Bangladesh.

BANGLADESH - SECTOR STUDY

VOLUME VI - RURAL DEVELOPMENT INSTITUTIONS ^{1/}

FOREWORD

i. The Rural Works Program (RWP), the Thana Irrigation Program (TIP) and the agricultural cooperative credit system of the Integrated Rural Development Program (IRDP) represent a concerted effort to develop strong rural institutions throughout Bangladesh. Construction of basic rural physical facilities (roads, drainage and canals, flood embankment and community building) under RWP, organization of farmers into viable economic groups that can undertake cooperative rental of tubewells and other cooperative enterprises under TIP, and extension of credit to small farmers organized for cooperative purposes under IRDP, have a major role to play in the dissemination of new production technologies.

ii. Each of the three programs evolved from experimental work at the Academy for Rural Development at Comilla. Each program operates at the Thana level, at which it was determined (for reasons of size, cost, communication and economic organization) that rural people and Government officials could cooperate effectively in planning and implementation of rural development programs. Thana development plans provide the framework for RWP and TIP project work schemes submitted to Thana councils by the union councils. The Thana Council (and particularly the Circle Officer) is responsible for overseeing the planning and implementation of the development program. Thana Council headquarters are also the sites of Thana Training and Development Centers (constructed under RWP), workshops for repair and maintenance of irrigation pumps, and warehouses for agricultural inputs. They are also the sites for the new Thana Cooperative Credit Associations operational in 20 Thanas, and to be extended countrywide under the IRDP.

iii. The Integrated Rural Development Program is directed towards the small farmer. The Thana Cooperative Credit Associations (TCCA's) now provide only agricultural credit to their affiliated village agricultural cooperatives. Ultimately they should also provide marketing, storage, processing and other agricultural cooperative facilities. These functions should aid farmers in benefitting from increased productivity, and provide increased incentive to farmers.

iv. The three programs for developing rural infrastructure are mutually reinforcing. They have withstood trial, and in the case of RWP and TIP the test of countrywide implementation. A detailed account of the RWP, TIP, and agricultural credit systems (including the plans to implement the IRDP) are

^{1/} The Reports in this Volume are based on work done by an appraisal mission including Messrs. Craig-Martin, D. Hoerr and R. Stern in February-March 1971.

(ii)

given in the following three reports. All three are in need of updating and review in the light of recent institutional changes in Bangladesh. However, the recommendations for improvements given in the three Reports should be valuable in any reconsideration of rural institutional policies in Bangladesh.

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BANGLADESH
LAND AND WATER RESOURCES SECTOR STUDY

VOLUME VI
RURAL DEVELOPMENT INSTITUTIONS

TECHNICAL REPORT NO. 17

THE RURAL WORKS PROGRAM

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TECHNICAL REPORT NO. 17

THE RURAL WORKS PROGRAM

SUMMARY AND CONCLUSIONS

i. The Rural Works Program is designed to channel the initiative of the rural people for rural infrastructure development. The program, which was tested for a year in Comilla Thana before being established on a country-wide basis in 1962, operates through a three-tier system of local government councils, the most important of which has proven to be the middle tier Thana council. Funds allocated to the local councils by Local Government (LG) Department enable the councils to implement labor intensive construction projects within their jurisdiction. Planning for rural construction works begins at the lowest governmental level, the Union Council, where local members develop project plans for their respective works. Project works are limited to roads, drainage canals, flood embankments and community buildings, and must be consistent with long range Thana development plans. Work programs must be approved by the LG Department after they have been reviewed successively by each local council. By engaging the rural people themselves in the planning and implementation of project works, the RWP offers a rapid and relatively inexpensive means of constructing and improving rural infrastructure, and creates a large number of employment opportunities during the slack agricultural season when unemployment is as high as 60% among rural workers.

ii Since 1962, three quarters of RWP funds (totaling Rs 710 million) have gone into the construction of roads, and the balance into drainage and canals, community buildings and flood embankments. Over 12,000 miles of kutchra (dirt) roads have been constructed, and 71,000 miles of kutchra roads have been repaired. The sizeable allocation of RWP funds towards roads, and particularly kutchra roads is likely to continue. The estimated economic rate of return on new feeder roads construction into the existing road system indicates that kutchra road construction (with a 14% average rate of return) is more attractive than pucca (paved) road construction (with a 9% average rate of return) -- a calculation that takes into account recent construction costs and projected traffic intensity, but not the social benefits, such as better access to schools, and better services.

iii. The program was highly successful until 1967 when it began to be used politically and control over project works and funds became lax. The recommendations that follow are based on a pre-war appraisal of the status of the program and are directed towards reinstating RWP (or a suitable institutional alternative) as an effective tool of rural development.

iv. The following suggestions are offered for consideration by the Secretariat of Local Government and Rural Development:

- (1) A Deputy Secretary of suitable rank and calibre may be needed to assume the directorship of the RWP on a full-time basis.
- (2) The instructions issued by the Secretariat to local councils governing the operation of the Rural Works Program may need to be reviewed, up-dated, and re-issued. Among other things, the revisions may consider how to strengthen local planning (particularly long-term planning) and how to ensure public accountability for RWP funds possibly by reinforcing the requirement for public posting of information pertaining to RWP projects.
- (3) Specific efforts may be necessary to see that RWP budget allocations are made on the basis of population and area, or physical potential. Although such rules remain on the books, there appear to have been instances in which it has not been followed. Deviation means the allocation process may become subject to strong political pressures.
- (4) The feasibility of introducing a fully independent system of audit, designed to prevent the misuse of funds, needs to be explored. Standardized specifications may have to be developed and distributed to all executing agencies with the requirement that they be followed for all projects built under the Rural Works Program. Present specifications are loosely written and may be difficult to enforce. The immediate benefits might be better quality in construction. In the longer term, construction costs could decline as contractors become familiar with these specifications and bid documents.
- (5) Provisions requiring that previous project works be maintained both from local council revenues and from new allocations may need to be more strictly observed. The possibility of providing annual funds and a permanent labor force to local councils may be worth exploring.
- (6) Supervisors may be required to be in the field continually during the Works Program season to check on the degree to which regulations are being followed. Enforcement of the rules and action against violators may be important. Additional engineering skills for all Rural Works projects, but particularly for drainage schemes, may need to be made available to local councils.
- (7) More study may be necessary to coordinate individual phases of the Rural Works Program. Saving might be realized by simultaneous construction of drains, embankments and roads in some areas. This, may require more sophisticated engineering skills than are now available at the local level.
- (8) It may be useful to reinstitute the annual meeting and training course for Circle Officers in Comilla. The course could also be attended by the secretary and officers of the LG Department who

would then be able to meet Circle Officers and make clear that they are available to assist any Circle Officer. Re-establishing communication between the field and the department would help the department reflect adequately the needs of the program and the field officers. The training program for technical supervisors may need to be revised to offer the technicians more specialization. The "Jack of all Trades" approach which is now being used may not be satisfactory in the future, and the opportunity to gain practical experience is limited by the general low volume of construction.

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THE RURAL WORKS PROGRAM

I. INTRODUCTION

1.01 In recent decades, natural calamities have been so common in Bangladesh that public expenditures in rural areas have gone largely for relief rather than infrastructure. Research into the problems of the rural population and some small-scale innovations by the Pakistan Academy for Rural Development (PARAD) in Comilla indicated that if rural infrastructure development is to occur it has to be based on the initiatives of the rural people themselves. Further, the framing of rural development programs and their implementation should be by rural leaders in partnership with government officials. Such partnership needs to be close to the people and the Thana level has been chosen as the most appropriate level. Thanas were formerly revenue and police administration units, for which manageable size permitting close contact with the people was similarly essential. There are 413 Thanas in Bangladesh averaging in area 125 sq. miles.

1.02 With the objective of tapping rural initiatives and associating the rural population with rural development, the government introduced three closely related programs: 1) the Rural Works Program (RWP), 2) the Thana Irrigation Program (TIP), and 3) the Integrated Rural Development Program (IRDP). The first two provide the infrastructure on which to develop the productive capacity of the land and the third provides the cooperative organization through which increased productivity can be realized. All three operate within the same Thana institutional framework, ensuring their close integration and maximum decentralization. In all these programs the rural population formulates the project proposals, participates in the planning of the programs and to a large extent executes them. Local officials control expenditures and provide technical services. Together they make possible a large number of small, widely scattered but important projects, which would otherwise be very difficult, impossible to execute. The Rural Works Program was started in 1962 and included the construction roads, bridges, culverts, embankments, drains and rural buildings.

II. RWP OPERATING PROCEDURES^{1/}

2.01 Within the framework of five-year plans, annual budgetary allocations were made to the Local Government (LG) Department for the Rural Works Program. The Department sent out directives to local government institutions setting forth the general categories of programs which they could undertake (thus limiting their activities to those which had priority in the development plan), and laid down the procedures which had to be followed in both the planning and implementation of these programs. Allocations of

^{1/} The procedures which are described are those used prior to the establishment of the independent state of Bangladesh. As far as is known these procedures are substantially the same at present (April 1972)

RWP funds by the LG Department to councils were made on the basis of population.

2.02 Planning for rural construction works commenced at the Union Council, the lowest local government institution; each elected member of the council was charged with initiating and formulating plans for projects in his own ward. These were then presented to the Union Council which discussed them and aggregated them into a Union Plan. The Union Plan was submitted to the Thana Council, which comprised chairmen of its constituent Union Councils and the 'nation building' department officers assigned to that Thana; the council was able to approve or reject the schemes but could not revise them. On the basis of these union proposals, the Thana Council also developed plans for its own projects. These annual plans are supposed to conform to five-year plans for roads, drainage and irrigation which were maintained at Thana level.

2.03 Consolidated Thana/union plans were submitted to the District Council for review and approval. The District Council then submitted these schemes for the entire District, as well as District Council plans, to the LG Department, which again reviewed them. Funds were then released to councils at all three levels to carry out the programs that had been approved. A number of important rules govern the actual use of funds once they had been provided. Among these were the requirement that labor-intensive techniques must be used where feasible and that contractors should not be hired to do the job unless necessary. Local Council officials were charged with the supervision of the work under the program, and detailed accounting procedures were laid down for the use of funds. The records at each Union were audited by the Thana Circle Officer (Development) (the senior LG representative at Thana level) and checked in the field by inspection officers of the LG Department. Misuse of funds was controlled primarily by requiring that public information on the size of each Council's allocation and the amount spent for each project be made readily available, usually by billboards.

2.04 Project committees set up by Union Councils were responsible for actual implementation of rural works projects. They were usually headed by and appointed by the ward member in whose constituency the project was. Each committee had a secretary who was paid the equivalent of 2% of the project cost, and who was responsible for maintaining the required records. Project committees and works were supervised by Thana technical supervisors who reported to the Circle Officer. Once projects were completed, the local councils were charged with their maintenance. Each year 25% of local council revenues were to be spent on maintenance work, and top priority in using new RWP funds was to be given to repair and maintenance work for facilities already constructed.

III. PAST PERFORMANCE

3.01 Between 1962 and 1968, for which figures are available, the achievements of the RWP were impressive. Funds available totalled Rs 710 million and were allocated to the different constructions in the following proportions:

	<u>Percent</u>
Roads	74.5
Drainage and Canals	4.1
Embankments	4.0
Community Buildings	16.7
Miscellaneous	0.7
	—
	<u>100.0</u>

3.02 The mileage figures given in the "Performance Report on Rural Works Programmes" are of doubtful validity in the view of Evaluation Officers of LG Department. However, a careful independent review* for the period 1962-1968 still presents an impressive picture of achievements, as follows:

	<u>Constructions</u> <u>1962-1968</u>
Dirt roads: new	12,381 miles
repaired	71,036 "
Area benefited	2,955,000 acres
Community buildings	3,195 number
Employment created	208,500 thousand man-days

3.03 After 1967, the RWP began to lose its connection with the grassroots. The Thana Five-Year Plans for 1966-70 prepared on the initiatives of the rural population through Union and Thana Councils, became progressively less the basis for annual programs. Union Council members, not facing re-election, lost interest and the program began to be misused by some councils to promote narrow partisan interests. As a result the control over the program by the LG Department weakened, leading to laxity in implementation preventing full potential benefits from being realized. LG Department had no copy of the Thana Five-Year Plans and in some Thanas they had been lost; in many cases Thana

* By Mr. John Woodward Thomas, Harvard University.

officials had no record of what part of them had been completed. As a result projects were approved as presented as long as funds were available. LG Department administrative and technical directives were progressively ignored and public notices of works undertaken were not posted or published.

3.04 If the program is to regain momentum the new annual programs may once more need to reflect rural initiatives. LG may have to take more direct interest in them so as to exercise closer control over officials and councils, and enforce compliance with directives and the posting of public notices.

IV. CONSTRUCTION METHODS ^{1/}

4.01 The construction methods under the RWP purposely made maximum use of local labor using spades and head baskets. Compaction was by hand rammers or by sections of concrete pipe used as hand pulled rollers. Lack of pulverization resulted in many air pockets and voids. There no moisture or density control and severe deterioration of embankments occurred. Turfing (sodding) the shoulders and slopes was sometimes done. This is an important step, particularly where the embankment is exposed to flowing water, and all new roads and embankments may need to be turfed. Paved roads were built over these embankments; the top 4.5 inches (6 inches loose measure) was metalled prior to applying a 2-inch layer of sand followed by a brick soling laid flat. The joints were filled with sand or powdered earth. For more important roads an additional layer of brick was laid on edge in herring bone bond. The most important roads then received a bitumous seal sprinkled with sand or khoa chips, or a structural overlay of either asphaltic concrete or Portland Cement concrete.

4.02 Although the design standards varied somewhat from Thana to Thana and from project to project, realistic averages can be applied. These averages, furnished by LG Evaluation Officers and verified at the Thana level were as follows:

Average Typical Sections

	Width at top	Side Slope	Height or Depth	Pavement Width
Embankments	8 ft.	2:1	3 ft.	--
Drains	10 ft.	1:1	3 ft.	--
Dirt (kutchra) roads	10 ft.	2:1	5 ft.	--
Paved (pucca) roads	15 ft.	2:1	6 ft.	10 ft.

^{1/} Methods are believed to be substantially the same at present (April 1972) as those described.

Concrete bridges and culverts were designed for H15 (15 ton) loading. They were mostly one lane having a clear roadway width of 10'-6". Wood bridges (which were used very infrequently) were also one lane and were designed for H8 (8 ton) loads. Construction specifications were available to the Local Councils through the Technical Supervisor. They offer little, if any, quality control and appeared to be un-enforceable.

4.03 Most projects received from four to six bids. Adequate labor force was certainly no problem, especially when the peak construction season did not conflict with the main cropping season. Basic skills in engineering, accounting and administration seemed to be the limiting factors when estimating the construction capabilities.

4.04 Directives dictated that 25% of the locally raised budget would be used for maintenance of works built under the Rural Works Program. This amount was inadequate to keep the facilities in satisfactory condition. Works were often allowed to deteriorate until they had to be rebuilt as a construction project. Little, if any, equipment was available at local level for maintenance and no permanent labor force was kept for that function.

V. A BENEFIT/COST ANALYSIS OF FEEDER ROADS

5.01 Clearly, the primary benefit of the feeder roads is the opening up of the countryside to markets and the consequent gradual monetization of Bangladesh. Analysis of the benefits of feeder roads in Bangladesh, however, is extremely difficult due to the high rate of unemployment (60% during the winter season) among the rural workers. Generally, a major benefit of a road system is that it saves time, but in a country with a surplus labor force this benefit must be heavily discounted.

5.02 Because of the high rate of unemployed, the labor component of capital costs has been systematically shadow-priced at Tks 1.70 per day --- which is about 60-70% of the day rate paid to unskilled labor under the Rural Works Project.

Road Building Construction Costs (Mile)

	<u>Market Price</u>	<u>Shadow Price</u>
Kutchra	15,600	9,522
Pucca		
Single Layer	67,500	56,250
Herringbone	100,200	87,860
Bituminous	150,400	135,968

5.02 Right-of-way costs have been estimated at Tks 10,500 per mile in the case of kutchas, and treated as a sunk cost for pucca mileage as the latter is assumed to be built over old kutchas in all cases. A number of simplifications have been introduced into the usual analysis for given standards of road sizes and surfaces. The economic aspects of vertical and horizontal alignment, and sight distances, have not been included for these lightly travelled roads, nor have grades, since virtually all the mileage is flat. Further, no analysis has been made of varying road width since vehicle "interaction" is so infrequent, and other considerations (such as accident losses) are trivial. While these factors may be of some consequence in many contexts, their omission does not detract from an analysis of feeder roads in Bangladesh.

Economic Rates of Return

	<u>Shadow Prices</u>		<u>Market Prices</u>	
	<u>Average</u>	<u>Marginal</u>	<u>Average</u>	<u>Marginal</u>
Kutchas	17%	10%	23%	13%
Village Pucca				
Single Layer	13%	7%	19%	11%
Herringbone	10%	5%	14%	8%
Bituminous	4%	2%	6%	3%

5.03 The main results of the benefit/cost analyses are set out above. They represent an estimate of returns on a mile of road in the existing feeder road grid--using current construction prices for new roadway and projecting traffic intensity into the future based on an average square mile of Chittagong and Comilla districts. Since the rates refer only to new construction, it is clear that "rehabilitation" would have a higher structure of returns.^{1/} The results are not particularly sensitive to changes in anything but construction cost (including land values). In fact, very substantial changes in either benefits or maintenance costs, or in length of road life, cause relatively small shifts in returns. The rates of return are conservative. Since data was uncertain those chosen may have erred on the conservative side thereby depressing the rate of return. For instance the mileage of kutchas roads for the two sample districts was that from the Harvard Data Bank. Records kept by the LG Department showed a grid with only half the mileage of the Harvard records. Using the higher mileage means that traffic densities and consequently benefits may have been understated.

5.04 In general, kutchas construction appears somewhat more attractive than pucca, even single layer brick: constructing pucca to a higher standard, which means higher construction costs but lower maintenance, only serves to reduce the overall return, for both double-layer herringbone and bonding over with a bituminous carpet. The difference between kutchas and pucca returns would also be widened to the extent that pucca mileage is "inter-village" feeder roadway rather than "village", for the doubled savings per mile would be much more than offset by decreased traffic on these segments.

5.05 The apparent advantage of kutchas is further increased by a more explicit consideration of the economic "switchover point" from kutchas to pucca. The question is complicated by traffic composition

^{1/} A fair amount of this work is done each year, part of it in the nature of "stage construction", and some of it performed in the place of omitted maintenance.

projections and what constitutes an acceptable rate of return, but if 7% on shadow priced benefits is acceptable, single layer pucca could reasonably be laid over kutchra when traffic approximated, say, 2,500 tons per pucca mile (or traffic from about 8 sq. mi. of the sample area at present output levels). However, this is "affordable", not recommended, for running this tonnage over kutchra rather than pucca would give a return in excess of 50%, rather than a mere 7%. To conclude in favor of pucca one must reason either that there is a very severe downward kink in the kutchra benefits curve as tonnage rises (not likely at these traffic levels) that kutchra mileage is out of use at critical points during the year (not true on the whole), or that there are very significant, unmeasured benefits to all-weather roads, or whatever other unique characteristics pucca may have. As will be seen below, the question becomes very much a value judgement.

5.06 There is a long list of unquantified benefits which are not included in the analysis: some of the more important ones being reduced costs--or increased income--from better access to supplies and services, including schools (and extension services), medical (family planning) and emergency services, mail, etc.; traffic originating from secondary marketing, marketing by deficit farmers who must pay debts, as well as casual traffic, e.g., field to field, and so on. Despite the difficulty in quantifying these benefits, several of them (such as family planning and better access by extension workers) are frequently assigned quite high values.

5.07 In short, the road building activities of the RWP--despite their limited attention to economic considerations--do not appear to have overbuilt the kutchra feeder road grid. Further extension can be considered justified in either "marginal" or "average" terms, depending upon the assumptions employed. If the incremental mileage is assumed to be built on the edge of a primary market grid, the measured, shadow priced rate of return would be closer to that for the hypothetical "marginal mile", viz., 10% but if the mileage is expected to fill in some gaps which exist nearer the center of the grid, the rate of return would be closer to the "average" of 14%. As noted above, neither of these rates measures anything like the whole of benefits to kutchra roads, hence would appear to justify further development of the grid's density--the extent depending upon value judgements as to acceptable rates of return. However, this justification broadens to include pucca roads only insofar as special circumstances prevail, whether with respect to traffic density or an absolute requirement for all-weather access. Even then, the cheapest form of pucca surfacing seems desirable.

VI. MINOR WATER CONTROL WORKS

6.01 The main component parts of water control works under RWP are excavation of drainage canals, construction of culverts (and bridges) to restore natural flows, and construction of low flood control embankments. Estimated unit costs are:

Drainage excavation	Tks 3,900 per mile
Embankments	Tks 8,000 per mile
Culverts and bridges	Tks 10,300 each

6.02 Cost estimates are from the same sources as in the roadbuilding component of the Rural Works Program. Canals are expected to require only Tks 85 maintenance per mile annually, while maintenance on embankments is estimated at Tks 977 per mile in the first year, Tks 488 in the second, Tks 244 in the third, and Tks 217 annually thereafter. The maintenance costs of bridges and culverts are included in roadways; structural maintenance would be negligible.

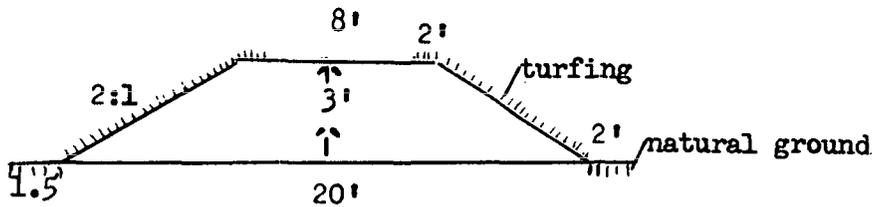
6.03 A Bank Mission which appraised a Rural Works Program in 1971, estimated the following need for minor water control works for 20 Thanas:- 166 miles drainage excavation, 274 miles embankments and 952 culverts and bridges. The estimated total cost of these works was Tks 12,645,000.

6.04 Benefits from drainage were based on the assumption that each mile of canal drains 48 acres, and that with better control of water levels, production would rise by 17 maunds paddy per acre on the average. Both these estimates were probably quite conservative, particularly the former. The LG Department Performance Report average was over 200 acres per mile, but Thomas' 8 thana sample survey suggested use of a lower figure. At Tks 22 per maund paddy, annual output would have increased by Tks 2,980,032. Government estimates of benefits from the flood control embankments ran to several times the cost per year, but the estimates were based on inadequate data. The mission assumed that benefits would at least equal costs. No returns were assumed to the expenditure on culverts and bridges since their main function was simply to restore natural water flows interrupted by other rural construction works. Despite these minimizing assumptions, estimated returns on the total water control investment were in excess of 100%, because drainage had such an extraordinarily high benefit/cost ratio. Even if the acres were drained, incremental output and rice prices had all been cut by 25%, and the canals had been assumed to deteriorate in a single year, the benefit-cost would still have been 2.2 to 1.

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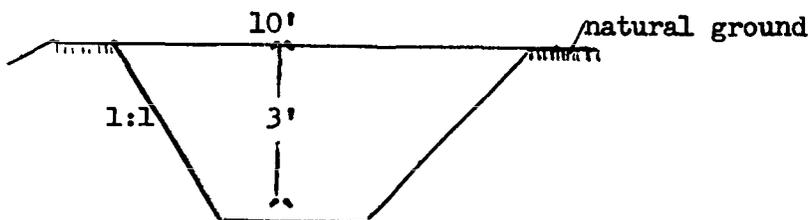
NEW WORKS COST ESTIMATES

Unit Cost - Embankment



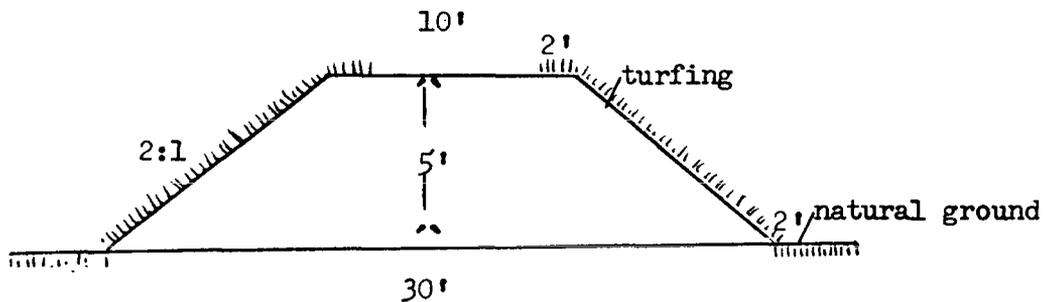
earthwork	$\left(\frac{8 + 20}{2}\right) 3 = 42 \text{ ft}^2$		
	$42 \times 5280 = 221,760 \text{ ft}^3/\text{mi}$		
	$221,760 \text{ at Kts } 25/1000 =$		5,544 Tks/mi
turfing	$(\sqrt{3^2 + 6^2} + 4) 2 = 21.4 \text{ ft}^2$		
	$21.4 \times 5280 = 112,992 \text{ ft}^2/\text{mi}$		
	$112,992 \text{ at Tks } 15/1000 =$		1,695 Tks/mi
		TOTAL	7,239 Tks/mi
		CALL	7,200 Tks/mi

Unit Cost -- Drains



earthwork	$\left(\frac{10 + 4}{2}\right) 3 = 21 \text{ ft}^2$		
	$21 \times 5280 = 110,880 \text{ ft}^3/\text{mi}$		
	$110,880 \text{ at Tks } 35/1000 =$		3,880 Tks/mi
		CALL	3,900 Tks/mi

Unit Cost - Direct (Kutchra) Road



earthwork $\left(\frac{10 + 30}{2}\right) 5 = 100 \text{ ft}^2$

$100 \times 5280 = 528,000 \text{ ft}^3/\text{mi}$
 $528,000 \text{ at Tks } 25/1000 =$

13,200 Tks/mi

turfiging $(\sqrt{5^2 + 10^2} + 4) 2 = 30.4 \text{ ft}^2$

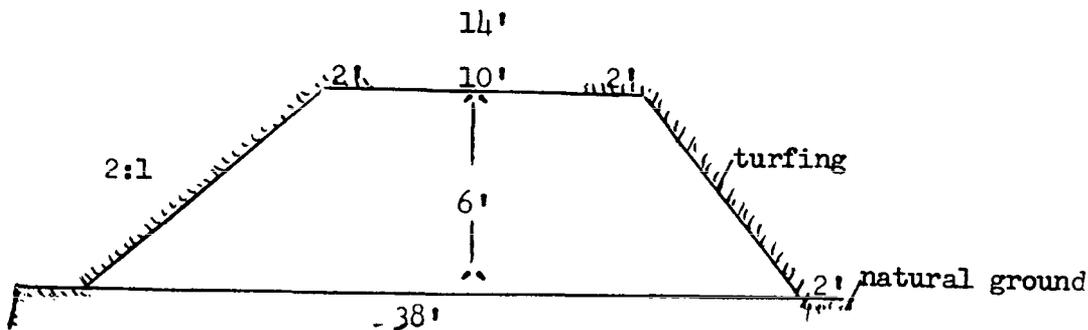
$30.4 \times 5280 = 160,512 \text{ ft}^2/\text{mi}$
 $160,512 \times \text{Tks } 15/1000 =$

2,408 Tks/mi

TOTAL 15,608 Tks/mi

CALL 15,600 Tks/mi

Unit Cost - Surfaced (Pucca) Road



earthwork $\left(\frac{14 + 38}{2}\right) 6 = 156 \text{ ft}^2$

$156 \times 5280 = 823,680 \text{ ft}^3/\text{mi}$
 $823,680 \text{ at Tks } 25/1000 =$

20,592 Tks/mi

turfiging $(\sqrt{6^2 + 12^2} + 4) 2 = 34.8 \text{ ft}^2$

$34.8 \times 5280 = 183,744 \text{ ft}^2/\text{mi}$
 $183,744 \text{ at Tks } 15/1000 =$

2,756 Tks/mi

TOTAL (earthwork and turfiging)

CALL 23,348 Tks/mi

23,300 Tks/mi

Assume that for an average new Pucca road, an average Kutchra road is already in place.

Earthwork	20,592 - 13200		7,392 Tks/mi
Turfing			<u>2,756</u> Tks/mi
TOTAL (earthwork & turfing)			10,148 Tks/mi
	CALL		10,100 Tks/mi
Surface			
Boxing (preparation for pavement)			
	$10' \times 5280 = 52,800 \text{ ft}^2$		
	52,800 at Tks 5/100	=	2,640 Tks/mi
Edging (bricks along edge)			
	$5280 \times 2 = 10,560 \text{ ft.}$		
	10,560 at Tks 18/100	=	1,900 Tks/mi
Metalling (broken brick base)			
	$5'' \times (10' - 2 \times 2-3/4'') \times 5280' = 21,156 \text{ ft}^3/\text{mi}$		
	21,156 at Tks 140/100		29,618 Tks/mi
Sand (2" thick mat.)			
	$(10' - 2 \times 2-3/4'') \times 5280 = 50,371 \text{ ft}^2$		
	50,371 at Tks 6/100	=	3,022 Tks/mi
Soling (brick laid flat)			
	$(10' - 2 \times 2-3/4'') \times 5280 = 50,371 \text{ ft}^2$		
	50,371 at Tks 40/100	=	20,148 Tks/mi
TOTAL (surfacing with single layer of brick)			<u>57,328</u> Tks/mi
	CALL		57,300 Tks/mi

This is considered an average condition for a new Pucca road. Therefore, the average cost of a new Pucca road would be:

earthwork and turfing			10,148 Tks/mi
surfacing			<u>57,328</u> Tks/mi
	TOTAL		67,476 Tks/mi
	CALL		67,500 Tks/mi

Unit Costs - bridges & culverts

For average unit costs of bridges and culverts, computations are shown for 10' (concrete slab) bridges, commonly called culverts, and 20' (concrete girder) bridges. These are the minimum lengths from the standard designs furnished by B.D. and L.G. Recognizing that some of the structures will be longer than minimum, thus increasing the unit costs, some of the structures will also be pipe culverts which will offset this differential.

10' (slab) bridge		
Abutment (12 foot headwalls and wings)		3
excavation 2 (12 x 6 x 12 + 10 x 6 x 10 x 2) = 4,128 ft ³		
4,128 @ Tks 35/100	=	1,448 Tks
brick		
2,650 ft ³ @ Tks 235/100	=	6,227 Tks
concrete		
376 ft ³ @ Tks 310/100	=	1,166 Tks
steel		
660 lbs @ Tks 70/cwt	=	412 Tks
		<hr/>
TOTAL (Abutments)		9,253 Tks
superstructure		
concrete deck		
166 ft ³ @ Tks 4.5	=	747 Tks
772 # @ Tks 70/ cwt	=	482 Tks
Rail		
14 ft ³ @ Tks 9	=	126 Tks
206 # @ Tks 70/cwt	=	129 Tks
		<hr/>
TOTAL (superstructure)		1,484 Tks
		<hr/>
TOTAL FOR 10' BRIDGE		10,737 Tks
		<hr/>
CALL		10,700 Tks
20' (girder) bridge		
Abutments		9,253 Tks
Superstructure		
Concrete deck		
257 ft ³ @ Tks 4.5	=	1,156 Tks
2,301 # @ Tks 70/cwt	=	1,438 Tks
Rail		
23 ft ³ @ Tks 9	=	207 Tks
316 # @ Tks 70/cwt	=	198 Tks
		<hr/>
TOTAL FOR 20' BRIDGE		12,252 Tks
		<hr/>
CALL		12,200 Tks

	<u>Tks/mi</u>	
	<u>Labor</u>	<u>Materials</u>
Surfaced (pucca) roads (new)		
earthwork	7,392	
turfig	1,654	1,102
boxing	2,640	
metalling	11,551	18,067
bats Tks 85/100 ft ³ = 61%		
breaking Tks 16/100 ft ³ = 11%		
placing Tks 39/100 ft ³ = 28%		
Sand	1,511	1,511
Edging and soling	2,205	19,843
bricks Tks 36/100 ft ³ = 90%		
laying Tks 4/100 ft ³ = 10%		
	-----	-----
TOTAL	26,953	40,523
 % labor =	$\frac{26,953}{67,476} = 40\%$	
 Bridges and culverts	2,975	8,625

No specific data is available.
 Figures from performance report
 indicate about 25% labor costs.

UNIT COST BREAKDOWN OF FOREIGN EXCHANGE

<u>Item</u>	<u>Unit Cost Tks/mi or Tks/Unit</u>	<u>%</u>	<u>Foreign Exchange Tks/mi or Tks/Unit</u>
Embankments	7,200	0	0
Drains	3,900	0	0
Dirt Roads	15,600	0	0
Paved Roads, new	67,500	11	7,580
Bridges and culverts	11,500	7	770

SUMMARY OF AVERAGE UNIT COSTS

(By Labor & Materials)

	<u>%</u>		<u>Tks/mi or Tks/Unit (rounded)</u>		
	<u>Labor</u>	<u>Material</u>	<u>Labor</u>	<u>Material</u>	<u>Total</u>
Embankments	91	9	6,500	700	7,200
Drains	100	0	3,900	-	3,900
Dirt (Kutcha) roads	94	6	14,600	1,000	15,600
Paved (pucca) roads, new	40	60	27,000	40,500	67,500
Bridges and culverts	25	75	2,900	8,600	11,500
Dirt (Kutcha) roads, (including bridges and culverts)	56	44	19,400	15,400	34,800

BANGLADESH - SECTOR STUDYMAINTENANCE COST ESTIMATESDirt Roads and Embankments

<u>Year</u>	<u>Tks Per Mi Per Year</u>					
	<u>Embankments</u>			<u>Dirt Roads</u>		
	<u>Labor</u>	<u>Material</u>	<u>Total</u>	<u>Labor</u>	<u>Material</u>	<u>Total</u>
1	1,910	340	2,250	4,000	500	4,500
2	955	170	1,125	2,000	250	2,250
3	475	85	560	1,000	125	1,125
4 and all years following	425	75	500	890	110	1,000

Maintenance Costs Drains

	<u>Labor</u>	<u>Material</u>	<u>Total</u>
Tks per mi per year	250	0	0

Maintenance Cost, New Single layer brick
(single layer brick)

<u>Year</u>	<u>Tks Per Mi Per Year</u>		
	<u>Labor</u>	<u>Material</u>	<u>Total</u>
1	2,500	2,500	5,000
2	1,950	1,950	3,900
3	1,700	1,700	3,400
4 and all following years	1,600	1,600	3,200

Maintenance Cost (New Double Layer Brick)

	<u>Labor</u>	<u>Material</u>	<u>Total</u>
1st and all following years	1,600	1,600	3,200

It is assumed that new double layer brick roads are built over old single layer brick, the road is therefore already fully compacted.

AVERAGE MAINTENANCE COSTS

(For the Three Grades of Improved Paved Roads)

<u>Year</u>	<u>Labor</u>	<u>Tks Per Mi Per Year</u> <u>Material</u>	<u>Total</u>
1 through 9	1,530	1,530	3,060
10	2,830	11,320	14,150
11 through 19	1,530	1,530	3,060
20	2,830	11,320	14,150
21 through 29	1,530	1,530	3,060

Bridges and Culverts

Maintenance costs are included in roadway maintenance; structural maintenance would be negligible in a 30-year period.

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INTERNATIONAL DEVELOPMENT ASSOCIATION

BANGLADESH
LAND AND WATER RESOURCES SECTOR STUDY

VOLUME VI
RURAL DEVELOPMENT INSTITUTIONS
TECHNICAL REPORT NO. 18
THE THANA IRRIGATION PROGRAM

December 1, 1972

Asia Projects Department

BANGLADESH - SECTOR STUDY

VOLUME VI - RURAL DEVELOPMENT INSTITUTIONS

TECHNICAL REPORT NO. 18

THE THANA IRRIGATION PROGRAM^{1/}

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^{1/} This Report was prepared by Mr. E.D. Hunting on the basis of drafts by an IDA mission led by Mr. P. Craig-Martin.

SUMMARY AND CONCLUSIONS

i. The Thana Irrigation Program began in 1966 as an extension of the Rural Works Program. Administered by the Local Government (LG) Department, it operated through the local Union and Thana Councils to promote the formation of local irrigation of pump groups that applied to Agricultural Development Corporation (ADC) for the rental of low-lift pumps or tubewells on the basis of approved irrigation plans. Each irrigation pumps group functioned as a primary cooperative society and affiliated with a secondary cooperative society, either a Thana Central Cooperative Association or a Cooperative Central Bank.

ii. Since 1966, the irrigated area roughly doubled to more than 700,000 acres under the TIP, bringing almost two-thirds of the area under improved seed varieties. At the same time, the program developed the initiative of the farmer (who has been willing to pay for water), and together with the RWP proved the feasibility of a program that depends on responsibility at the local level. Inevitably, there were operational problems - pumps, tubewells, and water supply were underutilized, schemes were drawn up usually without technical assistance, provisions for long-range technical planning were inadequate, pump rentals were frequently, not paid on schedule, maintenance and technical and managerial training were poor. Also, questions arose over types of equipment to be provided, particularly as the program expanded to include groundwater irrigation.

iii. To increase the effectiveness of TIP, six suggestions follow:

- (1) The possibilities of increasing the number of hours of irrigation each day should be explored; including scheduled operation of units, improved distribution; and greater incentives;
- (2) Provision should be made for regular technical assistance in the field in support of the irrigation extension workers; staff might logically be part of a unit under ADC or WAPDA with specific responsibilities for the support and planning needed for a program such as the TIP;
- (3) Responsibility should be clearly designated for long-range technical planning to coordinate TIP schemes in overall water resource planning; this might logically be delegated to a unit under ADC or WAPDA;
- (4) Basic records on the operation and maintenance of all pumps should be established and maintained. To facilitate planning, the records should include data on hours of operation, water flow, and actual irrigated acreage.

- (5) Pump drivers should be recruited from members of pump groups rather than ADC employees, and provided with proper training;
- (6) Pump and tubewell rental charges in areas where demand has grown and water supply is limited should increase at a faster rate than in the past to encourage pump groups to use full amount of water available and to expand their service areas.

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TECHNICAL REPORT NO. 18

THE THANA IRRIGATION PROGRAM

I. INTRODUCTION

1.01 In 1966, following experiments in Comilla Kotwali Thana by the Academy for Rural Development a new infrastructure development program called the Thana Irrigation Program was started as an extension of the Rural Works Program (Technical Report No. 17). The two programs, RWP and TIP, became known as the Expanded Rural Works Program (ERWP). They were both administered together as ERWP by the Local Government (LG) Department.

1.02 Irrigation is well recognized as an economic proposition for many farmers but three-quarters to four-fifths of farmers in Bangladesh have small fragmented plots and the only way in which they can obtain the benefits of irrigation is to form a cooperative group. By forming such groups, they are in a position to request a low-lift pump or tubewell through the TIP, which passes the request to BADC for implementation. BADC is responsible for deciding if the conditions of flooding, ground-water availability and suitability are satisfactory and for siting the pump or tubewell; it must also find acceptable the irrigation distribution system proposed by the group, without insisting on any special system. The group, being a primary, cooperative society needs to affiliate with a Thana Central Cooperative Association or a Cooperative Central Bank. Each group has a manager and a model farmer who receive training in water management and modern agricultural practices under TIP at Thana Training and Development Centers.

II. TIP OPERATING PROCEDURES

2.01 Proposals for irrigation works are elicited from the local level by union council members and are combined into a thana plan along with rural works proposals. After the irrigation proposals are approved by the thana council, they are referred to a district approving authority, a technical body. As with the Rural Works Program, all plans must be within the yearly LG budget allocations for irrigation works. This annual planning is done within the framework of five-year irrigation plans drawn up and maintained at thana level. The division of responsibilities and duties of each organization involved in the Thana Irrigation Program are contained in Appendix 1 to this annex.

2.02 The Agricultural Development Corporation (ADC) is the principal organization responsible for the implementation of the Thana Irrigation Program; its duties and responsibilities are contained in Appendix 2 to this report. The ADC Thana Irrigation Officer is its principal officer responsible for implementing the TIP at thana level under the general supervision of the Circle Officer (Development).

III. INDICATIVE PAST PERFORMANCE

3.01 The initial emphasis of the Thana Irrigation Program has been on low lift-pumps rather than on more expensive tubewell investments. As the opportunities for small scale surface water irrigation are gradually being exploited, TIP is turning its attention to groundwater. The estimated TIP irrigated acreage grew from 321,000 in 1967/68 to 711,000 acres in 1969/70. Further, the proportion of irrigated area under IRRI and other improved high yielding varieties rose from 38% in 1968/69 to 63% in 1969/70. Estimated TIP boro production was 1 million tons of paddy in the 1969/70 season and it is calculated that, in the same season, the TIP created about 42 million man-days of employment.

3.02 The achievements have thus been impressive; Bangladesh, a food deficient country, has experienced a large increase in rice production due to the impetus created by the program. It has also shown the potentialities of a decentralized approach relying on village level project identification and execution. Given the scarcity of administrative resources prevailing in Bangladesh, it is doubtful whether an irrigation effort administered in the traditional centralized manner could have met with such success.

3.03 The program also represented an advance in another area. Previously, great difficulty had been experienced in collecting payment for irrigation water. But, under the TIP no pump was supplied until a year's rental in advance was paid; although the rental charge, 350 Rs per 2-cusec pump per season, did not meet the investment costs of low-lift pumping and tubewell irrigation, the program established that small farmers in Bangladesh are willing to pay for water.

3.04 Despite past achievements, some difficulties remained in operation of the program. Major factors which are discussed below include the following:

- (1) Pumps, tubewells, and the supply of available water were seriously underutilized;
- (2) Irrigation schemes were drawn up in most cases without the benefit of technical assistance in the field needed for proper designs of distribution layouts, and channel improvements and effective schedules for pump and outlet operation;
- (3) The Program Manual did not clearly designate responsibilities nor adequately provide for long-range technical planning to coordinate small-scale irrigation schemes within the framework of the overall programs for water resource development and to assist in administrating water rights between competing service areas;
- (4) Operations suffered from inadequate maintenance; procedures for collecting rentals were not always carried out properly.

3.05 The efficiency with which pump groups have utilized low-lift pumps and tubewells provided under the TIP has been low. Generally a two-cusec pump or tubewell has irrigated on the average 30 to 40 acres, when it could irrigate over 120 acres of boro rice if utilized fully.^{1/} The main reason for this appears to be the low number of hours pumping per day. ADC reported in 1969 that pumps were used for an average of only about 6 hours per day, thus utilizing only about 25% of the available water.

3.06 This indicates that considerable potential for small-scale irrigation under this type of program exists in addition to the potential remaining from unexploited sources of water. Without diverting additional flow from the rivers, irrigation provided for as long as, say 14 hours per day would, in that case, use as much as 60% of the supply available. ADC, even within the range of distribution it has achieved previously, could further increase the area served from available surface flows under even longer hours. Where pumping is done from standing water bodies and from groundwater reservoirs, the resource generally could not be exploited further by longer pumping hours, since theoretically, there is effectively no upper limit on the rate of pumping, and, therefore, the limit is determined only by the total volume pumped from the reserve and the annual recharge. However, in cases where additional well units or pump capacity cannot be obtained for reasons such as procurement or installation difficulties, these existing resources also could be further exploited by longer operation.

3.07 Some reasons that groups have not improved utilization of their units are the following:

- (1) water supply is adequate at some sites and there is yet no pressure to enlarge the existing group or groups;
- (2) A low pump rental charge which provides little incentive to enlarge the service areas of the pumps and the size of the groups;
- (3) Inadequate technical planning and review of irrigation layouts;
- (4) Insufficient irrigation extension and inadequate training for the pump groups.

^{1/} Although irrigation duty for a rated 2-cusec unit of 40 acres on about 6 hours daily supply appears quite good, in most cases actual water use is less efficient since actual capacity of the pumps often exceeds the rated capacity. The average pump is rated for 2-cusecs at pumping heads over 30 feet, but the average pumping heads encountered were between 5 and 10 feet.

In many cases farmers outside the original groups are blocked from the supply which, with well-organized use of the pumps and existing channels, could reach their fields. Without irrigation officers in the field who are aware of, and can demonstrate, the possibilities for wider distribution; the farmers outside may resign themselves to the potential of their holdings as they see it, and there would be very little pressure for the existing pump groups to enlarge for a new group to form in an area already served. Incentive to expand the service area, therefore, will depend on active technical assistance in the field. Consequently, improved utilization cannot be motivated by higher pump charges alone. To have a positive impact, the increased rental must follow a growth in demand in locations where no further supply is available.

3.08 Better use of the water supply under greater demand and possibly resulting from higher pump charges could be achieved simply by staggered operation of several pumps drawing from the same supply and by rotating duty for single units. However, to improve water use poses these questions:

- (1) Could pump groups be motivated to adopt longer hours of operation?
- (2) Would farmers be willing to cooperate in larger groups and to adopt schedules for sharing pump units and distribution networks?
- (3) Would larger pump groups be less effective under a program such as TIP?
- (4) Could water be distributed further than the present average $\frac{1}{2}$ to 1 mile inland without more extensive engineering than the minor channel improvements and scattered multiple-pumping previously implemented by ADC?

Trial and error in the field and detailed study of these questions could help to unlock the large additional potential for the low lift pump operation. A combined study involving the Academy for Rural Development, ADC and the Agricultural Research and Extension Services may be needed.

3.09 The philosophy of the program was not to enforce any special distribution system on the groups but to accept a group's proposal for a distribution system if it was reasonably satisfactory. ADC was primarily concerned at the time with forming new pump groups and increasing the number of pumps fielded under the program. The expansion over the last 10 years took place with very little improvement in irrigation practices and without increase in the average size of irrigation groups, and, as a result, the overall average efficiency of pump use declined from a high of about 76 acres per 2-cusec unit to the present average of 40 acres per 2-cusec unit. ADC's responsibility under the TIP was not defined clearly to include the engineering review needed to ensure effective use of pumps and limited supplies of water.

3.10 However, the need became evident in the first year of the Thana Irrigation Program for long-term planning covering drainage, irrigation, and related embankments and roads. Accordingly, the Thana Irrigation Maps were instituted to accumulate information regarding resources and schemes at the thana level for technical assistance and approval by WAPDA and the LG Department. Although this arrangement was never adequately implemented before,^{1/} to exploit the great potential for small-scale irrigation it should be activated. Further, it is suggested that field-level irrigation engineers and technical extension personnel assist at the thana level in technical planning and design, in technical advice to irrigation and agriculture officers, and in administration of water rights. Technical assistance also should extend to support the training of Thana level officers, the proper organization of maintenance facilities, and the creation of operational manuals for various aspects of the program. Such a staff might logically be part of a unit under WAPDA or ADC which would review the Thana Irrigation Maps and also provide the needed long-range technical planning.

3.11 The primary extension system fostered by the TIP is based on the training of group managers and selected model farmers from each group at the thana training and development centers (TTDC). The thana irrigation and agricultural officers (TIO and TAO) are the chief trainers and are responsible for organizing the weekly classes. However, although most of these officers held a university degree, they were given no instruction on how to conduct such training courses. There were a number of agencies producing extension material in Bangladesh but most TAO's did not receive it. Apart from a few thanas which set up demonstration plots at the TTDC's and convenient villages, TIP training appeared to be purely academic. Unless TIP training is given more practical orientation and TAO's are given both instruction in farmer training and access to training materials, this system of agricultural extension may have little prospect of becoming more effective.

^{1/} After the program in ten pilot thanas was expanded for the country in 1967/68, ADC reported that only 32% of thanas surveyed had obtained approval by WAPDA engineers in 1967/68.

3.12 Although pump rentals were supposed to be paid in advance there have been instances where pumps were supplied to irrigation groups without payment being made. Pump maintenance, which was an ADC responsibility was inadequate. It is impossible to locate accurate figures as to the exact extent of this problem but there were apparently a large number of cases in which low-lift pumps were inoperable owing to mechanical faults. The fact that a large number of low-lift pumps have now been in operation for several seasons and will require increasing attention and also the added responsibility of tubewell irrigation is bound to exacerbate this problem. Causes for inadequate maintenance appear to be the following:

- (i) The ADC mechanics have had limited training and experience.
- (ii) The ADC mechanics lack transport facilities and equipment to respond to calls for minor repairs quickly and to carry out routine preventative maintenance.
- (iii) Thana and district level workshops lack capable mechanics and equipment to carry out the repairs.

3.13 Although it is a TIP requirement that the pump operator should be recruited from among the pump group, this requirement has not been enforced; only an estimated 40% of the pump drivers are from local villages. This resulted in some of the following difficulties:

- (i) Some groups have been delayed in commencing irrigation owing to shortages of pump drivers.
- (ii) The driver as an employee of ADC rather than the group has little incentive to work efficiently for the group, particularly in connection with pump care.
- (iii) Since only one driver is supplied to each group, pumps are only operated part of the day, making for inefficient use of pumping facilities.

3.14 The ADC, through its own thana level officers, dealers and TCCA's, distributes fertilizer and seeds in Bangladesh (Appendix B). Pesticides are distributed by the Department of Agriculture through its Thana Plant Protection Officer. The prices of fertilizer and seeds are subsidized but in spite of this, shortcomings in the availability of credit have prevented some farmers from taking advantage of these facilities. Inadequate storage facilities in some thanas have also impaired the smooth operation of the distribution system with the results that actual distribution has tended to fall behind planned targets. Suggestions for expanded fertilizer distribution and plant protection services are described in Technical Reports Nos. 14 and 15 respectively.

IV. TUBEWELL DESIGN AND CONSTRUCTION

4.01 Many of the irrigation tubewells now in use have been constructed by hand-boring methods - either percussion or jetting - as a 10" to 12" bore hole to the depth necessary to accommodate 120' of screen. While jetting is more rapid than percussion as used in Bangladesh direction and size of the hole are much more closely controlled in percussion drilling. Six-inch brass screen is most common, with either mild steel or galvanized steel pipe for blank. Gravel is installed only around the screened section. In all of the older wells, the entire well was constructed of 6" casing. Recently, ADC-TIP wells are being constructed for the most part with "expanded tops", with 12 or 14-inch pipe in the upper 60 feet to accommodate deep well turbine pumps. Where present water levels and draw-downs permit, centrifugal pumps are installed.

4.02 Well development is carried out either by over pumping and back-washing or by use of compressed air. Despite the claims of the drilling authorities for full development using compressed air, it is doubtful that this is correct. The ADC placed a minimum discharge of 1.5 cusec on acceptable wells, with contractor's penalty of Rs 2500 per .25 cusec below 2.0 cusec. Even with this requirement, however, few of the tubewells are apparently discharging up to design. In the Comilla-Kotwali area, most installations are said to yield 1.0-1.3 cusecs. Lack of reliable discharge and water level measurements render a proper explanation impossible. It seems most likely that pumping levels are lower than believed, and fall even farther as the dry pumping season progresses.

4.03 A pump house of masonry and reinforced concrete is constructed at each well. Discharge is through a flexible hose to some conveyance outside the house.

Choice of Design

4.04 The main constraint in pump selection is the water level in relation to the surface. Centrifugal pumps are efficient with pumping levels of 15 to a maximum of about 20 feet below the pump intake. Turbine pumps are most efficient at lifts of 35 to 40 feet and more.

4.05 While data on pumping drawdowns in the existing ADC-TIP wells are lacking or unreliable, six to seven feet drawdown per cusec of discharge would be as little as could be expected. Therefore, where the static level is more than 8 to 10 feet below the pump level, centrifugal pumps cannot be expected to yield their design discharge, even if as low as one cusec. Static levels on drilling reports in Kotwali Thana average about 12 feet. With annual water level variations as they are, and likely to increase with greater use of pumps, even four to six feet at the end of the rainy season may be too low. The results of using centrifugal pumps under such conditions are: (i) initial yield may be low; (ii) as the dry season progresses, the water table drops farther, and the pump discharge decreases further. The low acreage irrigated per tubewell in the project area is believed to be due in part to these reasons.

4.06 Insufficient studies have been made to properly estimate the ultimate effect on the water table of extensive groundwater development. It appears that a large volume of pumping is possible within the safe yield, but general static levels at the end of the pumping season will probably decline considerably more than at present. A tubewell designed for use with a turbine pump may be used with either type, while one designed for centrifugal is not usable for turbine. Whereas it is feasible in some environments to lower a centrifugal pump into a pit when the water drops, this is not practical in an area of 90-100 inches of rain and/or overland flooding.

4.07 It is therefore suggested that the tubewells be designed for turbine pumps. In some cases, where water levels and specific capacities are high, they may be designed for centrifugals initially to cut capital cost but capable of using a turbine in the future. Design for turbine pump then dictates the use of "expanded top", or pump housing casing, in the upper 50-60 feet of the well. For 2-cusec discharge, 6" well casing and screen is sufficient. Eighty feet of screen is ideal for the aquifer conditions and utilization factors expected for the installation, but in a properly constructed well, 60 to 70 feet would be sufficient. Choice of casing is governed by the factors: corrosiveness of the water; hydraulic efficiency; cost; ease of handling; availability. Mild steel is rendered unsuitable for Bangladesh because of corrosion. Rope-wound (coir) screen is not manufactured in Bangladesh; a trial well in the past was termed a "failure", but no details were available; poor well hydraulics makes operation expensive. Brass, fiberglass and polyvinyl chloride (PVC) appear to be suitable.

4.08 Brass is subject to electrolytic corrosion under the normal practice in Bangladesh but can be used with proper design. All should be similar in hydraulic characteristics; PVC is most difficult to handle, fiberglass the simplest. While PVC cannot be recommended for large projects when extensive stocks must be stored in a hot climate and where speed is essential, for individual wells it should be suitable.

4.09 Estimated market and handling costs per foot of 6" slotted casing are:

Type	Market Cost	Est. Handling	Total @ 7.25	@ 10.0
Fiberglass	\$7.25	Tks 4	Tks 56	77
Brass	Tks 50	Tks 5	Tks 55.0	65.00*
PVC	Tks 16	Tks 9	Tks 25.0	25.00

* 20% of market cost considered foreign exchange.

PVC is then considerably cheaper, and although it has not yet been used in Bangladesh, it should be usable on an individual well basis where it can be handled carefully and time of installation is not critical. A suitable method to attach the PVC to steel casing would have to be devised.

4.10 In view of the price differential between fiberglass and PVC and the fact that PVC is manufactured locally, it is suggested that PVC casing be tried on some of the tubewells. Since it is a new use of the product and a number of techniques need development, the installation should be made under careful supervision. The Kotwali TCCA has a great deal of experience in general techniques; it is suggested that 10 wells in that Thana be used as PVC experimental installations. Fiberglass should be generally used for reasons of low cost and ease of installation.

Capacity of Tubewells

4.11 Two-cusecs has been chosen as the standard capacity for tubewells in Bangladesh primarily because this quantity is sufficient water to properly irrigate the holdings of 50-60 farmers, the number which appears to be about the maximum for cooperative groups.

Choice of Drilling Method

4.12 Several methods of "hand" drilling are now in use in Bangladesh: percussion, percussion-jetting, and rotary-jetting. While percussion is perhaps slightly more expensive and slower, a better well should result. Reverse rotary drilling is quicker which could have some advantages, constructs better and more efficient wells, and according to recent contracts in Bangladesh is competitive in cost. However, because of the scattered nature of the work and because small contractors without mechanized equipment may be used, hand drilling methods may be preferable; further it would encourage the growth of an indigenous well drilling capacity in Bangladesh. It is perfectly possible with proper supervision of hand percussion drilling to obtain the vertical holes necessary for turbine pumps. However, in view of the fact that both hand percussion and reverse rotary drilling appear satisfactory it does not seem necessary to exclude reverse rotary drilling under the project.

Means of Construction

4.13 There are two general means to achieve construction of tubewells: force account by ADC, (organized by the TIO at thana level) or private contractors. The ADC presently has 80 drilling units, but only 30 are operative owing to lack of conductor pipe. The number of contractors available in Bangladesh is not known. There are four large drilling firms, and at least twenty small ones. A recent ADC contract for 600 wells was divided among 17 contractors, of which 14 were small, hand boring operations.

Cost of Construction

4.14 Estimates of actual contract costs of similar tubewells in Bangladesh vary considerably. Following is a tabulation of several contracts and estimates, less pump and engine, but including installation of equipment.

Name	Type Casing	Size Casing (inches)	Hole Size (inches)	Length Screen (feet)	Cost (Tks)	Pump Type
ADC-schedule of rates	S-Br	12-6	16(?)	120	40,500	T
ADC-contract ^{/1}	S-Br	14-6	18	120	43,900	T
ADC-contract (Yugoslav barter)	S-Fg	14-8	22	120	49,000 ^{/2}	T
Comilla TCCA	S-Br	6	10-14	120	20,000 ^{/3}	C
ADC-IDA Loan Appl. (contractor)	S-Fg	14-8	22	120	40,900	T
ADC-IDA Loan Appl. (ADC)	Fg	6	10-14	120	27,200	C
IDA Appraisal Rpt.	S-Fg	14-8	22	120	33,500	T

S - Steel
 Br - Brass
 Fg - Fiberglass
 T - Turbine
 C - Centrifugal

^{/1} Both reverse rotary and indigenous techniques.

^{/2} Assumes Tks 11,500 for pump and driver and 15% for barter premium as deductions from lump sum of Tks 67,000.

^{/3} Billings range from Tks 19,500 to Tks 35,000, but ADC pays Tks 20,000 maximum.

4.15 Unit prices obtained varied considerably:

6" Brass strainer - Tks 50, 48, 42, 65
 drilling, per foot - Tks 60, 15, 45
 gravel per foot - Tks 3, 4, 6

but some unit prices have been arrived at quite artificially, that is, by unbalancing unit costs to arrive at a given lump sum in such a fashion as to ensure higher returns in the early part of the contract.

Present Irrigation Practices

4.16 The farmers in Bangladesh have only recently been introduced to irrigated agriculture and this in part is probably responsible for the fact, already described that water is not used to full efficiency and that pumping equipment is underutilized. Whereas 2-cusec should be sufficient water to irrigate about 120 acres of boro rice, the crop with the highest irrigation requirement, the average 2-cusec tubewell pump in the Comilla area irrigates only 50 acres (the range is from one to 77). The pumps are operated only 10 to 12 hours a day, immediately reducing by half the irrigable acreage per pump. Pumps often discharge directly into the village tank or pond rather than into conveyance channels. Considerable losses must occur in this method owing to increasing evaporation area and seepage; however, they do yield supplementary benefits in the form of domestic water supplies and fish production.

4.17 Field ditches are minimal, plot-to-plot irrigation being the common irrigation method. This results in heavier application than required near the head of the system and on the lower plots, while the peripheral areas and higher fields receive slow and lighter supplies. Irrigation of crops other than rice is made difficult. If sufficient water were made available, it seems certain that the irrigated area per pump could virtually double. This easily could be accomplished by prolonged pumping into a proper conveyance system to carry water quickly away from the discharge point to the outlying fields. Consequently, emphasis may be needed on the water distribution system to get water on the fields more quickly and with less waste. Land levelling in individual basins may also be important to raise farm irrigation efficiency. Detailed study of a buried pipe or elevated conduit system of conveyance might indicate a favorable return particularly considering the extreme pressure on land in Bangladesh. Discharge points can be placed at a distance from the well, thereby allowing more land to be brought under irrigation than is now practiced with plot-to-plot flow. Either method allows nearly complete cultivation as compared to ditches.

4.18 The obvious first step to be considered, however, to more fully utilize the pumping capacity is to investigate the feasibility to irrigate 24 hours per day during the periods in which peak water requirements occur. Based on boro irrigation requirements, highest utilization may be required between January and April, with peak requirement varying throughout the country - about January in Comilla, Chittagong and March-April in the Northwest of the country.

Availability and Source of Materials

4.19 Drilling Rigs. For percussion drilling, equipment could be fabricated locally, but much, if not most, of the materials, must be imported. Long lengths of good quality pipe are not fabricated in Bangladesh. Reverse rotary rigs can either be imported or fabricated from largely imported materials. A small rig mounted on a farm tractor has been developed in Bangladesh. This is quite mobile and capable of drilling 200 to 250 feet without difficulty. Jetting equipment is fabricated locally with some imported components.

4.20 Casing Pipe. Steel pipe in larger sizes is not available from locally rolled sheet. Four or eight-foot lengths are welded together to make longer lengths, an unsatisfactory procedure in the absence of excellent workmanship. PVC pipe is manufactured in at least smaller sizes in Bangladesh. If larger sizes (14-16") were available, savings could undoubtedly be effected in its use as pump housing casing. Fiber-glass pipe is not presently manufactured in Bangladesh. Several companies have expressed interest in establishing a plant, but none has come to fruition. Some brass sheet is fabricated locally but except for available scrap, the brass must be imported.

4.21 Pumping Equipment. Turbine pumps are manufactured in Bangladesh by KSB Pump Company. While presently the KSB concentrates on centrifugal pumps, turbine production could be expanded if necessary. Most of the components for turbines are imported; casting and machining are carried out locally. No diesel engines are now fabricated in Bangladesh; present suppliers are England, Germany, and Russia. Gravel is derived from Sylhet.

BANGLADESH - SECTOR STUDY

ALLOCATION OF RESPONSIBILITIES UNDER THE TIP

(A) Union Council and Ward and Local Agricultural Committee

1. Organize irrigation or pump groups;
2. Provide Union Council members to serve as ex-officio chairman of irrigation groups; and
3. Map the ward and union for irrigation potential.

(B) Irrigation or Pump Group

1. Organize the distribution of irrigation water;
2. Excavate field channels; and
3. Collect charges from individual farmers and pay to the Thana Council.

(C) Thana Council

1. Give technical and mechanical support;
2. Construct housing, workshops and offices for the Thana Training and Development Center (TTDC);
3. Organize services and supplies;
4. Collect charges from irrigation groups and deposit them in the Thana Irrigation Fund;
5. Pay for services of ADC and WAPDA; and
6. Map the irrigation potential of the thana.

(D) ADC

1. Provide a Thana Irrigation Officer to assist the Thana Council with irrigation development;
2. Give technical and managerial training to managing committees, managers and drivers;
3. Provide low lift pumps/tubewells (where a large number are not required in a concentrated area);
4. Provide mechanics and maintenance supplies;
5. Provide or arrange for supplies of fuel, fertilizer and pesticides; and
6. Accept payment from Thana Irrigation Fund for low lift pump and tubewell operation.

(E) WAPDA

1. Examine the thana irrigation maps and give suggestions for improvement;
2. Provide water, where appropriate, through concentrated groups of tubewells;
3. Provide electric power for tubewells, where appropriate;
4. Operate highly technical facilities such as power-houses, large regulators and big pumps; and
5. Accept payment for services from Thana Irrigation Fund.

(F) Agriculture Directorate

1. Give training at the TTDC and union on irrigation, seeds and plant protection;
2. Supply technical assistance in organizing irrigation groups;
3. Provide field supervision and assistance through the Union Agricultural Assistants;
4. Provide pesticides to the irrigation groups; and
5. Furnish means to control insects and plant diseases where these are beyond capabilities of irrigation groups.

(G) Academy for Rural Development, Comilla

1. Assist in the preparation of training materials; and
2. Conduct courses in training methods and, at the request of departments and agencies, in technical subjects.

(H) District Approving Authority

1. Ensure that procedures have been correctly followed, and
2. Settle problems between thanas, particularly on water allocations.

BANGLADESH - SECTOR STUDY

BANGLADESH AGRICULTURAL DEVELOPMENT CORPORATION

General

The Bangladesh Agricultural Development Corporation (BADC formerly East Pakistan Agricultural Development Corporation (EPADC) is an agency of the Bangladesh Government, established in 1961. It is administered by a board of not more than five Government appointed directors. Government appoints one of the Directors to be chairman and chief executive. The Corporation operates under the auspices of the Department of Agriculture and the Secretary for Agriculture is one of the directors.

The Corporation has powers to act independently of government procedures in carrying out its functions, in all matters except matters of policy, audit and accounts which are directed by the Government. It has powers to recruit staff under its own conditions of service and possesses disciplinary powers defined by its own regulations.

Functions of the Corporation

BADC's primary function is to procure, transport, store and distribute to farmers supplies of agricultural inputs including seeds, fertilizers, plant protection chemicals and agricultural machinery and equipment. To do this, it has powers to promote the setting up of co-operative societies, through which distribution to farmers is normally made. It is also empowered to take over and manage government-owned seed multiplication and livestock breeding farms and fruit businesses, on terms laid down by government; it may promote the manufacture of improved agricultural machinery but may not itself undertake such manufacture.

Its most important secondary function is to promote the development of irrigation in **Bangladesh** by organizing the supply, maintenance and operation of low-lift pumps and tubewells. It has adequate powers to

execute this function. In designated project areas it may also undertake a complete range of agricultural development functions, including research, extension, marketing and the provision of credit.

Finance

The Corporation derives its funds from:

- (a) grants and loans from Government;
- (b) grants from local authorities;
- (c) proceeds of sales of Government bonds;
- (d) loans sanctioned by Governments;
- (e) development fees it levies on beneficiaries of its projects;
and
- (f) other fees and charges (including tubewell rental charges)
sanctioned ~~by~~ Government in BADC project areas.

Its annual budget is subject to the approval of the Government.

Audit of Accounts

The Corporation's accounts, which must be maintained in a form prescribed Government, are subject to annual audit by auditors appointed by Government.

BANGLADESH - SECTOR STUDY
TIP MAINTENANCE REQUIREMENTS^{1/}

Maintenance may prove to be the greatest problem in successful pump irrigation although those in the organizations entrusted with the task profess satisfaction with the present state of maintenance. The greatest needs appear to be:

- (a) trained mechanics;
- (b) equipment and transport for the mechanics;
- (c) spare parts; and
- (d) major repair facilities.

It is doubtful that a complete maintenance program should be attempted at the Thana level. Duplication of equipment, stores and training might result. Likewise, a maintenance organization separated into surface water pumps and groundwater pumps might be an expensive and talent-wasting exercise. Rather, one organization should be considered to administer the entire operation and maintenance program, at least to the equipment operator's level.

While actual numbers of personnel and locations of some facilities may depend upon workload and ease of communication, a general organization is suggested. It may be advantageous for the equipment operator to be a member of the pump group, but his duties may have to be technically supervised by trained circulating mechanics, each of whom would be responsible for a specified number of surface and groundwater pumps.

The operator is not qualified to make adjustments or repairs to the machinery. His duties should be to keep the equipment fueled and oiled, to keep the installation cleaned, to start and stop the engine, and to report problems to the circulating mechanic or Thana maintenance office.

The most important level of maintenance during the early years of pump installation may be preventative maintenance. A trained mechanics may need to circulate around a specified group of installations, so that he visits each group no less than once every 10 days. He may require a minimum of supplies and tools to make oil changes, minor repairs and adjustments. It may be advisable for an equipment report card to be filled out on each visit, describing problems encountered, actions taken, and recommendations.

The circulating mechanic may best be "based" at a Thana headquarters or centrally located area if two or more Thanas are combined for maintenance purposes. Although no Thana workshop as such is probably required until the number of pump installations grows large, equipment for pulling pumps --

^{1/} Preliminary discussions were held with the consultants to ADC under 3,000 Tubewells Project, 1970, on maintenance and repairs so as to extend the system they were introducing to all TIP areas. Further discussions should be held to ensure uniformity and precision.

A frames, chain hoists, chain tongs, wrenches, etc., **may have to be available** for use of the installation crews. The amount of equipment would depend on the number of installations.

The next level of maintenance should be handled by district workshops where first stage repairs requiring movement of the equipment, such as minor overhauls (valves, piston rings, etc.) **could be carried** out. Vehicle maintenance **could** also be carried out in these shops. Pump repairs should be minimal during the first few years of use, and **it might be more economical to have rate contracts with private** shops (preferably the manufacturer) than to equip a shop and train personnel.

Regional workshops exist on paper for the TIP. These **may have to be** activated, equipped and strengthened. Regional workshops **would be responsible** for major overhauls of engines, major pump repairs (when the workload makes it economical) and major vehicular maintenance for several districts. Five regional shops **may** be sufficient for the country as major repair work can be scheduled throughout the entire year. Emergency repairs **may not** be necessary if sufficient spares and stand-by units are available.

Equipment Required for Maintenance

At the circulating mechanic level, the necessary tools and supplies are small and could probably be carried on a scooter if four-wheeled vehicles are not available. Jeeps or Land Rovers **would be preferable, however. It is suggested that each mechanic should carry a tool box containing:**

a) Hand Tools

1. Box end wrenches as required
2. Open end wrenches as required
3. Screw Drivers
4. Ball peen hammer
5. Punch set (3)
6. Chisel set (2)
7. Allen wrenches
8. Wire brush
9. Fine wire for exploring passage way
10. Cleaning rags

b) Adjustment Tools

1. Tachometer
2. Feeler gauge
3. Small level
4. Straight edge

c) Supplies

1. Two reconditioned injectors
2. Two fiber discs used to connect motor to pump
3. Bolts, washers, and nuts for fiber discs.
4. Kerosene to clean filter area
5. Cotter pins
6. Lock washers
7. Flat washers
8. Small assortment of screws and bolts
9. Packing for gland on pumps
10. Grease gun (if required)

When electric motors are included in the group, include:

- a) volt meter
- b) clamp-on ammeter
- c) Megger
- d) electric tape
- e) fine emery paper
- f) assorted pliers
- g) assorted cable lugs
- h) crimping tool
- i) soldering iron

District and Regional workshops could follow the guidelines to be laid down by the ADC's 3000-well project. Lists of equipment required are to be prepared.

RESTRICTED

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT
INTERNATIONAL DEVELOPMENT ASSOCIATION

BANGLADESH
LAND AND WATER RESOURCES SECTOR STUDY

VOLUME VI
RURAL DEVELOPMENT INSTITUTIONS
TECHNICAL REPORT NO. 19
AGRICULTURAL CREDIT

December 1, 1972

Asia Projects Department

BANGLADESH - SECTOR STUDY

VOLUME VI - RURAL DEVELOPMENT INSTITUTIONS

TECHNICAL REPORT NO. 19

NOTES ON AGRICULTURAL CREDIT^{1/}

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A Note on Land Tenure

^{1/} This report is based on the findings of a mission to Bangladesh in 1971 led by Mr. P. Craig-Martin.

SUMMARY AND CONCLUSIONS

i. The Report concludes that a thorough review of the agricultural cooperative credit system in Bangladesh is required before the system can be put on a sound administrative and financial basis. At present there are three institutional channels for obtaining agricultural credit - The Agricultural Department which distributes Taccavi (relief) loans; the Agricultural Development Bank which makes commercial loans available to large farmers and agricultural businesses; and the Cooperative Credit system which makes loans through the Cooperative Bank (CB) to the cooperative central banks and finally to Union Multipurpose Cooperative Societies (UMCS). Each agricultural credit institution operates independently and hence fails to provide systematic credit especially to small farmers. Further, the institutions are hampered by inadequate financial support and poor administration. Repayment of Taccavi loans for example, has rarely been enforced - a situation that in itself is poor, but that also fosters a slack attitude on the part of the borrower towards repayment of borrowings from cooperatives. CB's recovering only 75% of its loans is indicative of the administrative weakness of its staff and the staff of its 62 member central banks. The bad debts of the CB far exceed its own funds and the Government 25% guarantees on State Bank loans to PCB (The main source of CB Funds) have had to be performed.

ii. The Directorate of Cooperatives provides some discipline to the cooperative credit system in that it registers cooperative organizations, audits accounts, promotes the formation of new cooperatives, provides field staff to work with cooperatives and supervises and trains cooperative staff. It runs a college at Comilla and 8 local cooperative training institutes. It provides these services for the most part to the UMCS's and to the intermediary cooperative central banks that are part of the CB cooperative system. But the Directorate provides very little assistance (only registration and credit) to a new system of cooperatives that is to be extended throughout the country under the Integrated Rural Development Program (IRDP), and that now exists in 50 Thanas. The system which, at the primary level, consists of village societies organized for the purpose of Thana Irrigation Program pump rentals or similar cooperative undertakings operates through Thana Central Cooperative Associations (TCCA), which obtain State Bank funds through the CB. While the initial effort of the TCCA is to extend agricultural credit, the TCCA may ultimately take on storage, marketing and other related agricultural cooperative activities. The decision to extend the system (which has involved the establishment of a Rural Development Board with wide latitude to supervise the IRDP and related rural development programs) was based on a series of trials beginning with experimental work at the Academy for Rural Development (ARD) to develop rural infrastructure that would be effective in making use of development resources.

iii. The Report includes recommendations by a SIDA technical mission related to organization and training (Section 6). Additional recommendations to unify cooperative systems, coordinate the work of the Agricultural Development Bank and the cooperative system, to question the role of CB and to develop comprehensive training programs, are given in Section 7. These recommendations are tentative as they are related to the institutional framework which prevailed prior to independence. A note on land tenure is given in Appendix.

BANGLADESH - SECTOR STUDY

VOLUME VI-RURAL DEVELOPMENT INSTITUTIONS

TECHNICAL REPORT NO. 19

AGRICULTURAL CREDIT

I. INTRODUCTION

1.01 Agricultural credit is provided by three different institutions, the Agricultural Department, the Agricultural Development Bank and the Cooperative System. The Agriculture Department distributes Taccavi loans through its extension staff. These loans are repayable within a year. They have mostly been given for subsistence purposes to small farmers with no other access to institutional credit. The rate of recovery has been extremely low because of poor administration (collection of repayments is done by the local revenue staff) and the attitude of the borrowers, who have regarded their loans as grants. The volume of Taccavi loans has increased during the past two years, in connection with several programs to increase rice production, but the Government is interested in having the Taccavi loans replaced by better administered institutional credit.

1.02 The Agricultural Development Bank has branches at most subdivisional towns. Its primary objective is to finance medium- and long-term investment in agriculture but about 75% of its total lending volume in Bangladesh is in short-term credit. Its funds are mainly lent to farmers with more than average size farm holdings and it does not have the administrative machinery to reach the small and medium size farmers at the village level. Its rate of interest is 8%. It normally requires land mortgage as security but is extending short-term loans on hypothecation of crops. ADB derives its funds from deposits, Government share capital contributions, loans from the State Bank and has received IDA credit for the financing of farm mechanization programs.

1.03 The Cooperative Credit System has three tiers: the Cooperative Bank at the apex, 62 cooperative central banks at the subdivisional level and about 4,100 multi-purpose cooperatives at the union level. About 8,500 groups of farmers provided with power pumps or tubewells under TIP have been organized as village-based societies and obtained loans from cooperative central banks. In addition to the cooperatives under the old system, the new thana based system of Thana Central Cooperative Associations, and village cooperatives is being developed.

1.04 The lending volume of these credit institutions was as follows:

Volume of Lending-Institutional Agricultural Credit

<u>Financial Year</u>	<u>Taccavi</u> (Mil.Tks)	<u>ADB</u> (Mil.Tks)	<u>Co-op</u> (Mil.Tks)	<u>Total</u> (Mil.Tks)
1965/66	17.8	41.5	9.3	68.6
1967/68	15.2	65.0	75.0	155.2
1968/69	30.0	75.0	90.2	195.2
1969/70 (estimated)	30.0	100.0	120.0	250.0

II. THE COOPERATIVE BANK

2.01 The CB was registered in 1948 as a scheduled bank under the Banking Ordinance. It is the apex bank of the cooperative credit system, comprising 62 cooperative central banks, some urban cooperative banks, 4,100 union based multipurpose cooperative societies, about 8,500 village based pump and tubewell groups and TCCA's.

2.02 The members of the Board are partly nominated by Government and partly elected by the shareholders. The Registrar, Cooperative Societies, who is the head of the Directorate of Cooperatives is ex-officio chairman of the Board.

2.03 The general manager is the chief executive officer of the bank. This post is presently held by an officer from the Directorate of Cooperatives. He is assisted by an officer on secondment from the State Bank and has under him a staff comprising 45 of whom 4 are of staff rank. These officers are on secondment from the Directorate of Cooperatives and have little banking experience.

2.04 The CB has a share capital contributed by Government and by cooperative central banks and other secondary cooperative organizations, each having a prescribed minimum relating to its borrowings. As of June 30, 1970, CB's total subscribed share capital was Rs 10.5 million of which the contribution by the Government was Rs 4.5 million. The following table shows the growth of the issued share capital:

	<u>30.6.67</u> Mill. Rs	<u>30.6.60</u> Mill. Rs	<u>30.6.70</u> Mill. Rs
Cooperative Banks	2.2	3.5	6.0
Government	<u>4.5</u>	<u>4.5</u>	<u>4.5</u>
Total	<u>6.7</u>	<u>8.0</u>	<u>10.5</u>

2.05 The CB is allowed to accept deposits and has been able to build up some deposits, but its main source of funds is the State Bank which provides short-term loans to finance the short-term loan requirements of the farmer members of the cooperative societies. These funds are lent to the PCB and distributed by this bank to all the central banks and again distributed by each central bank to its affiliated cooperative societies. The State Bank loans are to be repaid by the CB within 18 months, leaving time for the distribution and collection. The loans are covered by a Government guarantee of 25%. The short-term loans made available to the cooperative credit system by the State Bank have increased very considerably over the last three years, reflecting the high priority given to the agricultural sector in Bangladesh and the importance attached to institutional agricultural credit. The following table shows the growth of borrowings from the State Bank and the Government:

	<u>30.6.67</u> Mill. Rs	<u>30.6.69</u> Mill. Rs	<u>30.6.70</u> Mill. Rs
State Bank	24.0	57.3	137.6
Government	<u>20.4</u>	<u>60.6</u>	<u>79.5</u>
Total	<u>44.4</u>	<u>117.9</u>	<u>217.1</u>

2.06 The loans borrowed from Government reflect the unsatisfactory recovery performance of the short-term lending programs. These loans are identical with the guarantees, which have become effective, i.e. the amounts overdue from the farmers, at the specified dates. There are several reasons for the poor loan administration. The CB is too weakly staffed to be able to exercise adequate control over its member central banks. Its role in the administration of the cooperative lending programs is limited to the following procedures:

- a) to collect loan applications from central banks, stating the total loan requirement of the farmer members of the Union Multipurpose Cooperative Societies in the area of operation of each of these banks;
- b) to consolidate these requirements on a country wide basis;
- c) to apply for adequate funds from the State Bank;
- d) to distribute these loans to the central banks; and
- e) to collect the repayments and return the funds to the State Bank.

2.07 The central banks are also very poorly staffed and unable to supervise the activities of the UMCS. Most of the loan administration is done by the field staff of the Cooperative Directorate.

2.08 The CB obtains the State Bank loans at a rate of interest of 3% and relends the loans to the central banks at the rate of 4%. This margin of 1% is the main source of income of the bank. The following table shows the income and expenditures of the bank in 1966/67, 1968/69, and 1969/70:

	1966/67 Rs '000	1968/69 Rs '000	1969/70 Rs '000
<u>Total Income</u>	<u>3,198</u>	<u>6,803</u>	<u>9,349</u>
Expenditure			
Interest on Borrowings	1,849	4,977	7,107
Establishment	576	526	566
Profit	<u>773</u>	<u>1,300</u>	<u>1,676</u>
Total	<u>3,198</u>	<u>6,803</u>	<u>9,349</u>

2.09 No dividend has been paid to the shareholders in the last three years, and there have been no provisions made for bad debts. The bank takes interests accrued on all outstanding loans into the profit and loss account, including accrued interest on bad and doubtful loans so the above stated figures do not give the true picture of the income and profit earned by the bank.

2.10 The State Bank has investigated the affairs of the Bank. The investigation disclosed that the bad debts of the bank, including interests accrued on bad debts, far exceeded the bank's own funds. The situation is becoming more and more alarming all the time.

2.11 The lending programs in the cooperative credit sector (only for aus and aman) have rapidly increased during recent years, as will be seen from the figures below:

	<u>Mill. Rs</u>
1967/68	40.0
1968/69	70.0
1969/70	105.0
1970/71	102.0

2.12 The recovery of the loans up to 1970/71 has on average been about 75%, so that the full government guarantee has become effective, which is very unsatisfactory. The CB is paying interest of 6-1/2% on its Government loans which are financing the overdue laons extended to central banks on which no interest can be collected with the result that the financial position of the CB is rapidly deteriorating. The State Bank has suggested to Government that the CB should be substantially strengthened financially and managerially. This can be endorsed, but the CB's role in the administration of the cooperative lending programs is small. A thorough reorganization of the whole cooperative credit system, including not only the PCB, but also the central banks and the primary societies, appears to be urgently necessary in order to put the cooperative credit system on a sound financial basis.

2.13 The role of the CB in the Integrated Rural Development Program (see section 4) is at present very limited. The CB is included in the program, because of its relations with the State Bank. The TCCA's send their demands for short-term loans to the State Bank through the CB. The CB distributes the funds received from the State Bank to the TCCA's which make repayments at the due dates. These transactions involve a minimum amount of CB administration as long as the TCCA's are administering their lending programs correctly. The focus on proper organization and arrangement in the IRDP is primarily on the TCCA's.

THE COOPERATIVE BANK

Condensed Balance Sheet

(As on 30.6.)

	('000 Rs)		
	<u>1967</u>	<u>1969</u>	<u>1970</u>
Assets:			
Cash in Hand	10	19	10
Deposits with bank	15,360	27,474	31,646
Investments	5,639	6,265	6,275
Loans and advances	52,433	127,138	226,348
Other assets	<u>8,655</u>	<u>12,303</u>	<u>18,164</u>
Total	<u>82,097</u>	<u>173,199</u>	<u>282,443</u>
Liabilities:			
Share Capital	6,778	8,073	10,520
Reserve Funds	6,343	8,222	9,433
Loans from Government	20,445	60,657	79,489
Loans from State Bank	24,013	57,308	137,615
Overdrafts	4,798	12,617	14,637
Deposits	17,380	20,209	21,887
Other Liabilities	<u>2,340</u>	<u>- 6,386</u>	<u>8,862</u>
Total	<u>82,097</u>	<u>173,472</u>	<u>282,443</u>

III. THE DIRECTORATE OF COOPERATIVES

3.01 The Directorate of Cooperatives is a regular Government agency. It is placed under the Agriculture Department and is headed by the Registrar of Cooperative Societies. The primary function of the Directorate is to administer the provisions in the Bengal Cooperative Act of 1940, as amended by the Government of East Pakistan. All cooperative organizations and societies have to be registered by the Registrar and are subject to having their accounts audited by auditors appointed by the Registrar. In addition to its statutory functions the Directorate has undertaken functions like promotion of cooperatives, supervision of cooperatives, training of cooperative staff and research.

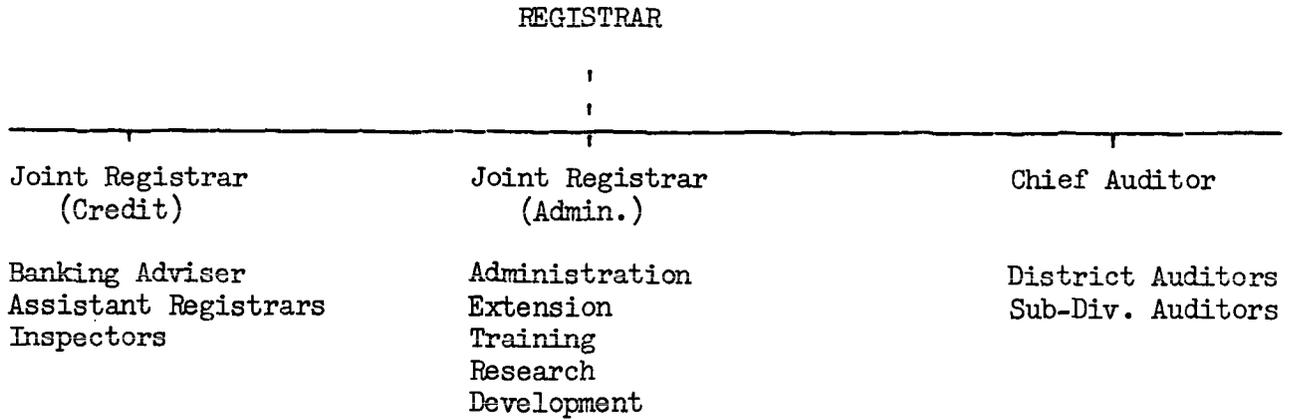
3.02 The Directorate has a central organization divided into three wings: credit, headed by a Joint Registrar and assisted by a banking adviser seconded by the State Bank; administration, also headed by a Joint Registrar; and audit, headed by a Chief Auditor. There are special sections under the administration wing for development, extension and liquidation. In addition there is a field staff, comprising a Deputy Registrar in each of the four divisions, of Bangladesh (Dacca, Khulna, Chittagong and Rajshahi), an Assistant Registrar in each district, a Sub Divisional Cooperative Officer in each subdivision and a Thana Cooperative Officer (TCO) in each Thana. In areas with large numbers of pump group societies newly recruited Union Cooperative Officers have been posted. The audit wing has staff posted in districts and there are special staff for fishery cooperatives, industrial cooperatives and other urban cooperatives. The Directorate runs a college at Comilla (where training is mainly given to cooperative officers) local training institutes, (where training is given to officers, staff of cooperative organizations and office bearers of cooperatives).

3.03 The field staff is closely associated with the administration of agricultural credit through the cooperative credit organizations. Cooperative officers are seconded to the CB and all the 62 cooperative central banks have officers from the Directorate as executive officers. Loan applications from the Union Multi-purpose Cooperative Societies, and the pump group societies, are processed by TCO's who also write the accounts of the societies and audit them. The loan applications are consolidated in the central banks and sent through the Assistant Registrar (AR) to the CB. For collection the societies and the central banks similarly rely on assistance from the field staff. The AR's have in addition to their powers under the Cooperative Act certificate powers so they can authorize collection of arrears.

TCCA's

3.04 The relationship of the Directorate to TCCA's is at present limited to registration and audit.

ORGANIZATIONAL CHART OF THE DIRECTORATE OF COOPERATIVES



DIVISIONS

|

Deputy Registrars (4)

DISTRICTS

|

Assistant Registrars (18)

SUB-DIVISIONS

|

Sub-Divisional Coop Officers (62)

THANAS

|

Thana Cooperative Officers (411)

UNIONS

|

(Union Cooperative Officers)

IV. THE INTEGRATED RURAL DEVELOPMENT PROGRAM

4.01 The Pakistan Academy for Rural Development (PARA), now the Bangladesh Academy for Rural Development (BARA), started functioning in May 1959. In addition to its principal function of training government officers, it undertook experimental work for evolving suitable patterns for rural development. It considered that the diffusion of ideas and adoption of innovations in rural areas must be promoted through the peoples' own institutions and that the lack of organization in rural areas has often proved to be a major bottleneck to the achievement of official production targets. The objective therefore of the Comilla approach was to create a rural institutional infrastructure for the effective utilization of resources available for development.

4.02 In February, 1960 Kotwali Thana in the Comilla District was taken over by the Academy for experimental planning and in January, 1962 the Kotwali Thana Central Cooperative Association was established and registered with the Registrar of Cooperatives, Department of Agriculture. It was decided to test the approach used in Kotwali Thana in three new areas; these tests were started in July, 1963 in Mymensingh, Rangpur and Rajshahi Districts. The tests were considered successful and a program to establish TCCA's in 7 Thanas was started in July, 1965; following evaluation of the progress in these 7 Thanas, the program was extended to 13 additional Thanas in October, 1968. The 20 TCCA's were originally administered by the Department of Agriculture but transferred to ADC in October, 1969.

4.03 In October, 1970 proposals were tabled to extend the system of TCCA's throughout the country's 413 Thanas and preparation of a program to be known as the Integrated Rural Development Program (IRDP) was begun. On February 2, 1971 the Bangladesh Rural Development Board (RDB) was established to administer the program.

4.04 The Board was given the following functions and authority within the framework of the policy directives of the Government: (a) to lay down the policy and exercise general supervision with respect to implementation of the Integrated Rural Development Program, and other related projects and programs; (b) to coordinate the activities of various departments/agencies connected with the program; (c) to approve the operational program and the annual budget and arrange for the audit of accounts; and (d) to take responsibility for other measures relating to rural development.

4.05 The Board was empowered to appoint special committees, an Executive Director and staff, decide terms and conditions of service, impart training to all officers employed, conduct research into rural development problems and evaluate performance of the program. The Board was to function under the administrative control of the Planning Department and have the following membership: The Governor of Bangladesh (Chairman); Chairman of the Planning and Development Board, ADC, WAPDA; Secretaries of the Finance Department, Agriculture Department, LG Department; Registrar, Cooperative Societies; Director of ARD, Comilla; and Executive Director IRDP (member-secretary).

4.06 A District Project Officer was to be posted in each district. He was to be a member of the District Development Coordination Committee headed by the Deputy Commissioner to maintain liaison with all agencies to secure support and cooperation for the program. He was to supervise the work of the Thana Project Officers in the TCCA's in his District.

4.07 Each Thana was to have posted in it a Thana Project Officer (TPO) in charge of the TCCA, which would elect its own Managing Committee. The TPO was to secure the cooperation of all Thana level organizations. In addition, a Deputy Project Officer and an Accountant were to be posted in each TCCA. Field inspectors were to be appointed and paid by the TCCA.

4.08 Personnel were to be carefully selected and thoroughly trained; numbers to be trained were to be sufficiently large to allow for selection during and after training. Thana personnel were to be on probation for at least one year in the field. Training was to be provided principally at the Academy for Rural Development (ARD) at Comilla and at the Cooperative College.

V. THE THANA CENTRAL COOPERATIVE ASSOCIATION (TCCA) SYSTEM

5.01 The TCCA is registered with the Registrar, Cooperative Societies, of the Department of Agriculture, as a secondary cooperative organization. It does not deal directly with the members but operates through primary societies. These societies, of 30-50 farmers, are voluntarily organized on a village basis, as groups for the joint use of low-lift pump or tubewell or some similar primary cooperative purpose. The societies elect their own managing committee, a manager, a model farmer and, where applicable a pump and/or tractor driver; the TCCA appoints an accountant to the society.

5.02 The activities of the TCCA include the promotion of new primary societies, accumulation of share capital, collection of members' savings deposits, extension of loans and training of managers and model farmers. The training of managers and model farmers has been done at Thana Training and Development Centers (TTDC) in conjunction with officers of various government departments under the Thana Irrigation Program (TIP) (see Technical Report No. 18). All members of primary societies are obliged to buy shares of Tk 10 each in the TCCA and are required to save regularly in accordance with a mutually approved plan drawn up in each society; the savings are not kept by the society but are deposited with the TCCA. The TCCA keeps all funds in an account with a local commercial bank.

5.03 The main activity of the TCCA is to extend agricultural credit through the primary societies affiliated to it. The procedures for such lending are as follows:

- (a) Primary societies are obliged to hold a weekly general meeting to discuss and agree on joint operations. Every six months, at these meetings, societies evaluate the credit needs of each member and set individual loan limits; production plans for the society are prepared as a basis for loan applications to the TCCA. The loan limits approved by the society for each member are submitted to TCCA field inspectors who prepare loan ceiling proposals for each society under their supervision. The proposals are reviewed and approved first by a loan committee consisting of the Project Officer, Deputy Project Officer and two elected members of the Managing Committee of the TCCA. After approval the society may request as many loans as it wishes during the six month period up to the total amount of the loan ceiling.
- (b) A member requesting a loan must do so at a weekly meeting and justify his request. He may be joined

by others making requests and the manager fills out a loan request form for all applicants together, containing the names of each member asking for a loan, the share and savings position of each, their six-month loan ceiling and the amount of the loan requested. The loan request form must be presented to the TCCA together with: (i) a resolution drawn up and signed by the members asking for a loan; (ii) a promisory bond signed by the members of the managing committee of the society; pledging that the society will repay on the due date; (iii) a loan repayment schedule under which the society promises to repay the installments of the loan; (iv) a power of attorney granting the TCCA authority to prosecute any individual defaulter; (v) two copies of a land mortgage for every member requesting a medium or long term loan.

5.04 These documents are examined by the inspector and submitted to the Deputy Project Officer with a report by the inspector. After approval of the loan by the Project Officer a loan advance form is issued to the manager of the society. The inspector releases the loan funds in accordance with his view of the proper use of the funds and not as one lump sum. Money is drawn from the commercial bank by the inspector and the manager, who pays out the loan to the member in the presence of the inspector. Members sign a loan disbursement certificate which is kept by the TCCA in the files it keeps on each society.

5.05 When a member makes a repayment the manager makes out a loan repayment receipt for counter-signature at the TCCA. The manager is obliged to show this receipt duly signed to the members at the next meeting of the society. In cases of default the inspector will first try to collect sums overdue and failing will recommend that a case be filed against the defaulter. An officer from the Cooperative Directorate of the Registrar will be deputed to assist on the case if proceeded with but most cases are settled out of court.

5.06 The TCCA makes short term loans of up to 18 months, but mainly of 6-8 months, for fertilizers, seeds, and marketing and other crop production purposes; it makes medium term loans of up to 3 years mainly for livestock, implements and the consolidation of debts to moneylenders; it makes long term loans of over 3 years mainly for land improvement, orchards, pumps and other farm machinery and release of mortgages mainly held by moneylenders.

5.07 To qualify for a loan, a member must have paid up all previous loans, saved regularly for at least 6 months, made a contribution to the share capital equivalent to 10% of the loan or have shares to that amount. No collateral is required for short term loans but land is usually taken in mortgage for medium and long term loans. As a general rule short term loans for an irrigated rice crop may not exceed Tks 200 per ac and for a non-irrigated rice crop may not exceed Tks 150 per ac. The loan ceiling for a society is not expected to reach Tks 30,000 until about the fifth year.

5.08 Loan charges levied by TCCA's on the individual members of primary societies are made up as follows:

	<u>Percent</u>
Interest charged by the State Bank to the Coop Bank	3
Service charge by the Coop Bank	<u>1</u>
Interest charged by the Coop Bank to the TCCA	4
Service charge by TCCA for HQ operation (a)	2
Service charge by TCCA for field supervision and training (b)	5
Service charge by TCCA on behalf of Primary Society (c)	<u>1</u>
Net interest charged to individual member	12
Interest collected on behalf of the Primary Society (d)	<u>3</u>
Interest charged to individual member	<u><u>15</u></u>

5.09 The TCCA's have no internal audit system. Their accounts are audited by a chartered accountant appointed by the Registrar, Cooperative Societies, once a year. The auditors report is sent to the Registrar and his field staff is responsible for supervision.

5.10 The TCCA's provide travel and subsistence allowances to managers and model farmers for their weekly visits to Thana Training and Development Centers (TTDC) for training. The allowance to managers is Tks 8 per training session attended and to model farmers is Tks 2. Training is provided at the TTDC by Thana level officials of various government agencies under the TIP.

IV. SWEDISH SIDA MISSION ON COOPERATIVES

6.01 On July 22, 1970, the Government of Bangladesh requested a Swedish mission to make a preliminary review of the cooperative system in Bangladesh and the training of cooperative officers. The mission was to pay particular attention to the needs arising from the decision to launch the Integrated Rural Development Program. The main findings of the SIDA preparatory mission recommended a more detailed and longer term investigation of their main findings by a team that they hoped SIDA might provide. Their main findings were as follows:

Organization

- (a) In connection with the establishment of an organization for the IRDP, a review of existing authorities dealing with cooperatives is necessary. This would include the IRDP organization the Directorate of Cooperatives, the cooperative Bank, the Central Cooperative Banks and the Multi-purpose Cooperatives run by the Directorate. Such a review should aim at a clear definition of the role of each organization and, following from that, proposals should be worked out for how they should be organized, changed or, possibly, dismantled. The review is particularly necessary in the case of the Directorate of Cooperatives and the Cooperative Bank. Possible alternatives for the administration of agricultural credits need to be considered.
- (b) In connection with the functional analysis of the cooperative bodies, distinctions should be established between the roles and responsibilities of Government employees and the employees or elected representatives of cooperative organizations.
- (c) A study of the present debt situation of the Cooperative Bank and the Central Cooperative Banks should be undertaken and a policy proposal for the handling of these debts should be worked out.
- (d) In connection with credit administration, a review of policies, practices and procedures, including accounting, audit, statistics, etc. is needed.

Training

- (a) Training requirements of the staff of IRDP, mainly at the Thana level, of the staff of the Directorate of Cooperatives and of employees of cooperative organizations need to be analyzed in detail. Particular attention should be paid to the training at Thana Training and Development Centers (TDDC). Programs should be directed in part towards training members of primary societies to become leaders and administrators of cooperative societies.

- (b) If the Cooperative Bank shall be responsible for agricultural credits, the questions of the training of its staff will have to be studied.
- (c) The division of labor between the Bangladesh Academy for Rural Development and the Cooperative College should be spelled out. A review of the function of the Cooperative College will probably show that the facilities of the College will need to be expanded. If that is so, a plan for the expansion of the College should be worked out.
- (d) There are eight zonal institutes under the College, used for training of cooperative officers and leaders of cooperative societies. A plan for their improvement should be developed.
- (e) The training programs and syllabus of the existing cooperative training institutions should be analyzed, as well as the institution's needs for facilities, equipment, books and budgetary allocations. During the review of the training programs, special attention should be paid to subjects like bookkeeping, accounting, auditing, business administration and marketing.
- (f) Advanced studies of subjects like management, business administration and marketing (desirable for an increasing number of employees of the cooperative organizations) need not necessarily be studied at special institutes for cooperative training. Instead, such training should take place at institutions like the Institute of Business Administration at the Dacca University. The University should be requested to establish the suitability of existing courses for the requirements of the cooperative organizations and, if needed, to take steps for the development of suitable courses.
- (g) Considering the fact that most people involved in the cooperative movement will be farmers, it is essential that the staff of the cooperatives have knowledge of agriculture. All cooperative educational institutions should, therefore, have orientation courses in agriculture and animal husbandry. These courses may possibly be prepared by the Mymensingh Agricultural University.

VII. ADDITIONAL SUGGESTIONS

7.01 Government support may need to be concentrated on the basic needs of the cooperative movement, especially in the initial stage of operation--training, extension services, advisory and supervisory services, capital contribution, subsidy for basic facilities, guarantee of loans, etc.

7.02 Taccavi loans may be best distinguished from grants or subsidies especially in the case of loans for relief. Because of the ambiguous nature of such loans, funds have been used for non-productive purposes and repayment has been low. This slack attitude towards loans has affected the repayment of borrowings from cooperatives. Caution may be needed that loans are written off only in cases of irrecoverable overdues, i.e., after all possible efforts have been made for recovery. Taccavi loans may possibly be made only to farmers who cannot borrow from the cooperatives and other credit institutions (small farmers below the subsistence level who are too risky for the cooperative credit in the immediate future and ways and means explored of eliminating Taccavi loans altogether. Instead, outright relief grants for disasters may be preferable.

7.03 The relationship between the Cooperative Directorate in charge of registration and audit of all cooperatives and the Rural Development Board (established for the IRDP) in charge of the new cooperative system, the responsibilities of each at the provincial, district and thana level should be defined clearly. This may be extremely important in carrying out a uniform policy because the existing system (including the Cooperative Bank is likely to remain under the control of the Cooperative Directorate.

7.04 To ensure proper supervision, Government may be most effective in supervising only administrative aspects. The financial side may be better handled by the central financing agency (for the time being, the State Bank may be the only agency capable, but the apex bank might be the agency responsible in future) because professional staffs of high caliber may not be available in the Government agencies.

7.05 Government may need to prepare a program to wind up the existing cooperative system and unify the two systems. Sound and healthy cooperatives could be transferred to the new system but insolvent cooperatives may have to be liquidated.

7.06 Before liquidating insolvent cooperatives every individual overdue loan could first be investigated thoroughly at the primary level. Then whatever measures necessary for recovery including compulsory proceedings may need to be taken. After such strict measures are followed the irrecoverable portion may become clear. Special action to write it off would be necessary at the final stage. A special government team or agency may be needed to complete this complex task.

7.07 Although commercial banks have played an almost negligible part in providing agricultural credit to date, they may need to be exploited in providing loans in the rural area. In particular, distributors of inputs and small processors of credit for marketing and storage could obtain loans from commercial banks in addition to the Agricultural Development Bank loans. The large credit requirement for agricultural development may not all be met without the participation of commercial banks.

7.08 Close coordination may be required between the Agricultural Development Bank and the cooperative system. Banks could utilize the cooperative network in making medium-and long- term loans to cooperative members.

7.08 Whether the Cooperative Bank will continue as the apex bank of the new system is not clear. Under the IRDP, the Bank used to channel the State Bank funds to TCCAs and it is not scheduled to function as their apex bank (to be in a capacity to provide professional services to its affiliated member in regard to financing and banking).

7.09 Since credit is the major operation of the cooperative movement, the TCCAs may have to first start as "credit cooperatives" instead of "multi-purpose cooperatives". When the credit operation becomes well stabilized as a viable business unit, its experiences and profits could be employed to systematically expand operations into marketing and allied fields.

7.10 To avoid deterioration of the financial position of the TCCAs initial operation may need to be limited to loans (mainly short-term loans) for agricultural production. Thus non-agricultural lending may have to be prohibited and non-credit operations may be considered only after receiving the approval of the Rural Development Board. The business operations of the TCCAs may need to follow the policies worked out by the Rural Development Board. In case of a uniform lending policy, factors to be included may have to be interest rate, security requirements, evaluation of security, etc. Based on these policies, instruction manuals for the staff (project officers, accountants, inspectors, etc.) could be prepared to unify the procedures used by the TCCAs. The present statistical and progress reports are not sufficiently informative and are deficient on lending progress, recoveries and financial results. Lacking an internal audit system, accounts may have to be audited by a chartered accountant once a year.

7.11 The present training arrangements for the membership and staff of the TCCAs are still inadequate to establish viable cooperatives based on responsible local leadership and firm membership loyalty. A major effort may be required to carry out a comprehensive training program. Since training of managers, model farmers and village accountants depends on the abilities of their trainers, who in turn need effective trainers, it may have to cover all levels, the TCCAs as well as the staff of the government and other supporting agencies.

BANGLADESH - SECTOR STUDYSOURCE OF RURAL CREDIT INBANGLADESH (1966)Non-Institutional

Friends & Relatives	52.05%
Landlords, Traders, Moneylenders	34.09%

	86.14%

Institutional

Co-operatives	7.73%
Agricultural Development Bank	5.36%
Taccavi Loans	0.77%

	13.86%

TOTAL	100.00%
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BANGLADESH - SECTOR STUDY
INSTITUTIONAL AGRICULTURAL CREDIT
ANNUAL VOLUME OF LENDING
(Millions of Rupees)

<u>Agency/Type</u>	<u>1960-61</u>	<u>1961-62</u>	<u>1962-63</u>	<u>1963-64</u>	<u>1964-65</u>	<u>1965-66</u>	<u>1966-67</u>	<u>1967-68</u>	<u>1968-69</u>	<u>1969-70</u> (Estimate)
Taccavi	13.48	21.45	29.00	38.45	30.22	17.79	19.04	15.28	25.40	30.00
A.D.B.P.	38.19	40.54	37.67	38.34	36.48	41.55	47.11	65.00	75.79	69.50
Co-operatives	43.08	45.70	37.82	35.35	25.57	9.38	23.18	70.10	79.05	123.80

Source: Planning Department, using data of:

- a) Department of Agriculture, Government of East Pakistan
- b) Directorate of Co-operatives, Dacca
- c) The Agricultural Development Bank of Pakistan, Dacca

BANGLADESH - SECTOR STUDY

A NOTE ON LAND TENURE^{1/}

1. The history of Bangladesh can be seen as the history of a system of rights to land and of the right to raise revenue from the holders of those rights to land. The present social conditions of Bangladesh are partly the result of the land tenure system. The history of the land system may be divided into four periods: The Hindu, the Muslim, the British and the Post-Independence. The Hindu period established the underlying principle of the Bangladesh land system, the undisputed right of the farmer to the land he tilled.
2. Throughout the Muslim period (1278-1765) the farmer's right to the land he tilled was maintained, while the rulers exercised a right to revenue, taxes, cesses and the power to make grants of waste land. Land revenue administration was governed by the fact that the supply of land in those days was much larger than the demand for it. Therefore, the aim of administration was to keep peasants on the land. A peasant was not displaced so long as he did his duty. Even when he failed to do it, he could not be displaced without a substitute being found; where land was waiting for cultivation, an inefficient cultivator would be better than none. Thus occupancy rights emerged as a matter of course and became customary.
3. In the latter part of the Muslim period a spectacular growth in the system of farming revenue occurred as local governors became more and more independent of the court at Delhi. The farmers in return for a stipulated payment, were allowed to appropriate revenue to their own use and to do as they liked with the tenants.
4. The period of British control of Bangladesh (1765-1947) was dominated by Cornwallis' Permanent Settlement Act of 1793. Prior to the Act, the Raj auctioned revenue rights annually. The Act sought to fix the revenue to be derived from the land and so to avoid the injurious effects of the previous auction and earlier revenue estimation and collection practices. The Act established the Zamindars as the hereditary proprietors of land. A subsequent Act of 1859 divided the tenants into three broad classes: (a) those holding land at a fixed rent since the Permanent Settlement Act -- tenure holders; (b) those holding land for twelve years whether at a fixed rent or not -- raiyats; (c) those holding land for less than twelve years -- under-raiyats. Successive Acts in 1885, 1928 and 1938 were promulgated to reduce the inequities of the system, to strengthen the position of the raiyats and under-raiyats and to promote land consolidation by removing the right of the landlord to charge a customary transfer fee of 20% of land value.

^{1/} This appendix was prepared by Norman Reynolds.

5. The use of fixed land revenue by the British in Bangladesh had effects that made a mockery of the niceties of the successive Acts. It enabled a large number of intermediaries between the Zamindar and the cultivator to arise, which in some districts reach fifty or more. The intermediaries were supported by the cultivator but had neither the responsibility, the power nor any incentive to improve the use to which the land was put. Government, faced with an inelastic land revenue fixed over long periods, had little inducement to invest in agricultural development since any benefit would flow solely to private parties.

6. A Commission on land tenure recommended the abolition of the Zamindar by eliminating all superior and middle rights to land, thus bringing the cultivators into a direct relationship with Government. The State Acquisition Act of 1950 enacted the Commission's recommendations. A further Acquisition Act of 1956 acquired all such interests in a summary manner. The legal situation vis-a-vis land tenure would appear today to be satisfactory. However, historical and more recently created forces that bear on land tenure complicate the picture and suggest that there may be reversion to what may be termed customary law. Qudir notes that up until a hundred years ago the village absorbed newcomers, but that no new families had joined the village since. Moreover little land had been acquired outside the village by the villagers since 1948, whereas before, land acquisition outside the village had enabled the families to maintain farm size from one generation to another. Competition for land is a relatively recent feature of Bangladesh life and is today heightened by what are surely severe limits to mobility, both geographical and social. The pressure on resources has, again within only the last decade or so, caused the breakup of many joint families into nuclear units. Such a development runs counter to the economic logic of the situation for it frequently involves a less optimum use of land, cattle and equipment and reduces the chances for consolidation. The facts presented by Qudir and by interviews with farmers and officials suggest that the joint family to survive must enjoy a minimum subsistence. Once deficits in food and the means to purchase other necessities arise, which today includes education, medical treatment and the like, the more able or better endowed will leave the fold, often at the insistence of their wives who may well hold their family's welfare above that of the group.

7. Litigation over field boundaries between neighbours was formerly the most common form of litigation and a case in court was considered to enhance a family's status. The costs of litigation have risen appreciably so that litigation cases are not so common today as they were a decade ago. Moreover, the nature of the majority of cases has altered. Now litigation over inheritance predominates: a fact that supports the rate at which joint families are breaking up. A new form of litigation has arisen which underlies the pressure on resources and which may have widespread economic and even political ramifications. In some areas litigation is being pressed by claimants to land who base their claim against the present title holder on the relative historical strength of the families' positions, i.e. claims for the control of land rather than for the adjustment of boundaries or of

inheritance. These claims arise, apparently, from the Permanent Settlement Acts of 1793 and, more particularly, 1859, which created three classes of tenants. It is not clear how rights prior to the State Acquisition Act can be enforced in court. Forged documents are often used. The documents are forged more because old registers have been nullified by the State Acquisition Acts than to present false testimony. The issue, which is claimed to be fairly widespread, is of importance because it represents the re-emergence of customary law.

8. A special case within the land tenure system of Bangladesh is that of the fishermen. All large water bodies were until the State Acquisition Acts controlled by the Zamindar. Fishing rights to these water bodies were sold annually to fishermen, most of whom, like the Zamindars, were Hindu. Even bodies of water which dried up during the winter and the land which was owned and farmed in the boro season by cultivators was, when wet, controlled by the Zamindars. The growing pressure on land produced a clash of interest between the fishermen and those cultivators who owned land which was annually flooded and while flooded controlled by the Zamindars. Most water bodies can be either drained through inexpensive local works, or maintained as fishing areas with the help of small dykes. Under the Zamindars the fishermen's rights, though only as annual lease right, were protected. After Partition and the State Acquisition Acts the Zamindar disappeared and the Government through the Revenue Department assumed control of the major water bodies. The cultivators were able, through their ownership rights and by virtue of their higher social status as cultivators, to force the drainage of many of the water bodies. There was also a rush in the period after the second Act (1956), which acquired all Zamindar rights in a summary manner, to claim land that was permanently under water.