

CONFIDENTIAL

Report NO. 389

INTERNATIONAL BANK FOR RECONSTRUCTION AND DEVELOPMENT

PROJECT PERFORMANCE AUDIT

of

FIRST BANGLADESH EDUCATION PROJECT

April 5, 1974

Operations Evaluation Department



PROJECT PERFORMANCE AUDIT  
FIRST BANGLADESH EDUCATION PROJECT

PREFACE

The procedure followed by the Operations Evaluation Department in its current work program is to cover IBRD/IDA projects for which disbursements ended in the first half of FY1973. Credit 49-PAK of March 25, 1964, was closed on September 22, 1972. This report is an audit of achievements under the credit measured against the objectives on the basis of which it was originally approved. The development of the project during the last ten years was considered to be fairly indicative of its performance, although subsequent projects made in this sector and future changes in Government policies may substantially increase expected benefits.

To prepare the audit relevant IDA files and documents were reviewed and the implementation of the project was discussed with IDA staff, Bengali officials and consultants who had been involved with it. A 10-day mission to Bangladesh was undertaken to update information and to discuss briefly the relevant issues with various project participants and other informed sources.

The valuable assistance provided by the Government of Bangladesh and the IBRD Resident Mission is gratefully acknowledged.

Note: Currency Equivalent:

1962 - May 1972: 1US\$ = 4.762 Rupees

Since May 1972: 1US\$ = TKs 7.55

TABLE OF CONTENTS

	<u>Page No.</u>
SUMMARY	
Basic Data Sheet	
I. INTRODUCTION	1
II. THE PROJECT	2
III. IMPLEMENTATION	4
A. Project Management	4
B. Delays and Costs	6
C. Buildings and Equipment	7
D. Program Performance	9
1. Sectoral Background	9
2. The Agricultural University	11
3. The Technical Institutes	13
E. Manpower Requirements and Policy	15
IV. CONCLUSIONS	17
 <u>Annex Tables</u>	
1. Bangladesh - Enrollments in Educational System, 1960-1970	
2. Bangladesh - Output of Educational System, 1960-1970	
3. Bangladesh - Financial Performance of Educational System, 1955-1970	
4. Bangladesh - Per Student Capital and Recurrent Costs (1967/68)	
5. Bangladesh - IDA Credit Disbursements by Category	
6. Bangladesh - Actual vs. Estimated Project Costs by Category	
7. Bangladesh - Actual vs. Estimated Project Financing by Type of Currency	
8. Bangladesh - Selected Indicators on the Expansion of the Agricultural University	
9. Bangladesh - Project Institutions - Actual vs. Projected Enrollment and Output	

Chart: Bangladesh - Structure of Educational System

Map: Location of Project Institutions

SUMMARY

The purpose of the project was to increase national capacity for the education and training of professional agriculturalists, industrial technicians and technical teachers. Critical shortages were especially felt at the intermediate technical levels. The project consists of the construction of buildings, and the purchase and installation of equipment for the establishment or expansion of facilities at the agricultural university of Mymensingh, for technical training at eight technical institutes, and for the provision of expatriate personnel and training grants for a technical teacher training college. Total project costs were estimated at US\$ 9 million and expenditures in foreign exchange at US\$ 3.7 million. The US\$ 4.5 million IDA credit 49-PAK of March 1964 was to be applied to the payment in full of equipment costs at the technical institutes and the agricultural university, and of personnel costs for the technical teacher training college. The balance of the credit was to be applied to construction costs at the agricultural university.

The completion of building construction and equipment procurement took twice the time originally anticipated. This delay in itself does not appear to have substantially affected project performance. Due to the slow development of teaching, research, and extension programs, student enrollments at the agricultural university could not have been expanded at a faster pace without a significant reduction in the quality of its graduates; and although the number of students graduated by the technical institutes is only about half that projected, effective demand for them was lower than available supply. Instructional programs were not constrained by insufficient space and equipment, the case being rather that available facilities could have been more intensively used, and that the equipment financed was to some large extent idle and poorly maintained. Construction and equipment costs increased anywhere from 20-50%, largely in real terms, over the disbursement period, but total IDA disbursements at US\$ 3.7 million do not adequately reflect these cost overruns which have apparently been absorbed partly by charging them to other sources of financing and partly by a reduction in the quantity and/or quality of project items. The records available are not sufficient to ascertain the extent of cost overruns in an operationally more meaningful manner, namely, on the basis of comparing the cost of the actual against the projected quantity and quality construction built and equipment installed. Disbursements were suspended in December 1971, due to civil strife in the country, and the undisbursed amount of the credit (US\$ 0.8 million equivalent) was subsequently cancelled.

The project has made a valuable contribution to the establishment and the expansion of the agricultural university and of the embryonic system of technical institutes in Bangladesh. Increases in the size of these institutions in terms of enrollments and graduates have been impressive, although they amounted to about two-thirds projected figures. The performance of the project in terms of the

efficient utilization of resources at its disposal, and the effectiveness of the training it provides relative to the developmental priorities and practical requirements of the industrial and agricultural sectors, is still not clearly established. However, a review of project performance should not lose sight of the general and unusual institutional, financial, logistical, and political difficulties prevailing over this period. The report confirms the need for project monitoring and for defining objectives more operationally in terms of specific contributions, within the framework of broader programs, to industrial and agricultural efficiency.

BANGLADESH EDUCATION PROJECT

Performance Audit Basic Data Sheet

Technical Report No. TO-397a

President's Report No. P-364

Credit No: IDA 49-PAK

- |   |   |   |
|---|---|---|
| 1. Borrower                               | : | Islamic Republic of Pakistan  |
| 2. Sub-borrower                           | : | Province of East Pakistan   |
| 3. Beneficiary                            | : | i. The Agricultural University at Mymensingh. (Construction and equipment for the expansion of the University)<br>ii. 8 Technical Institutes at Comilla, Faridpur, Mymensingh, Rajshahi, Dinajpur, Feni, Jessore, and Kushtia. (Equipment)<br>iii. Technical Teacher Training College, Dacca. (Expatriate teachers and overseas training of Bengali teachers) |
| 4. Amount of Credit                       | : | \$4,500,000   |
| 5. Amount Cancelled <sup>a/</sup>         | : | \$805,753   |
| 6. Amount Disbursed                       | : | \$3,694,247 <sup>b/</sup>   |
| 7. Amount Outstanding as of June 30, 1973 | : | \$4,456,534 <sup>c/</sup>   |
| 8. Amount repaid to IDA                   | : | 0   |
| 9. Date of Credit Agreement               | : | March 25, 1964  |

---

a/ Disbursements were suspended on December 29, 1971, due to civil strife in the country. The undisbursed amount of the Credit was cancelled on September 22, 1972, and the uncompleted portion of the project was merged into Credit 407-BD of June 29, 1973.

b/ Actual disbursements excluding exchange rate adjustment.

c/ Includes exchange adjustment to reflect the devaluation of the US dollar on May 8, 1972, and the proposed change in the par value of the US dollar announced on February 12, 1973.

- 10. Date of Effectiveness : September 10, 1964
- 11. Closing Date - Original : June 30, 1968  
First Extension : June 30, 1971  
Actual : September 22, 1972
- 12. Month of Final Disbursement : December 1971
- 13. Term of Credit : 50 years
- 14. Grace Period : 10 years
- 15. Service Charge : 3/4 of 1% p.a.
- 16. No. of Supervision Visits : 13<sup>a/</sup>
- 17. Overall Cost Overrun : 21%<sup>b/</sup>
- 18. Overall Time Overrun : 45 months<sup>c/</sup> 100%
- 19. Fiscal Year : ends June 30

- 
- a/ Schedule and composition of supervision missions.
- |                                   |                |
|-----------------------------------|----------------|
| Project (Architect)               | March 1964     |
| Project (Architect)               | November 1964  |
| Treasurer; Project (Tech. Educ.)  | May 1965       |
| Program; Project (Architect)      | November 1965  |
| Treasurer; Project (Tech. Educ.)  | September 1966 |
| Project (Architect)               | November 1966  |
| Project (Architect)               | March 1967     |
| Program; Project (Tech. Educ.)    | August 1967    |
| Project (Architect; Agric. Educ.) | February 1968  |
| Project (Architect)               | September 1968 |
| Project (Architect)               | June 1969      |
| Project (Architect; Tech. Educ.)  | March 1970     |
| Project (Architect; Tech. Educ.)  | August 1970    |

b/ This figure is the ratio of recorded costs over projected costs, excluding the cost of the convocation hall which has not yet been built. The records available are not adequate to ascertain cost overruns in an operationally rigorous manner, namely, on the basis of comparing the cost of the actual against the projected quantity and quality of construction and equipment.

c/ Excluding the convocation hall which is now scheduled for completion by 1975 under Credit 407-BD.

## I. INTRODUCTION

Credit 49-PAK for US\$ 4.5 million for agricultural and technical education in Bangladesh (then Province of East Pakistan) was signed in March 1964. The project was first appraised in 1962, one year before the Bank established a division for appraising educational projects within its Technical Operations Department. It was the third educational project prepared by IDA; the first two projects were for secondary education in Tunisia and Tanzania. The purpose of the project was to increase national capacity for the education and training of professional agriculturalists, technical teachers and industrial technicians, since there was an acute need for professionally trained personnel for research, training, extension and various other government services. Critical shortages were especially felt at the intermediate technical levels. For an agricultural labor force of about 14 million workers, and for an industrial labor force of 1.1 million workers there were less than 500 agricultural specialists and 1,500 industrial specialists enrolled at the post-secondary levels at the time of project appraisal (Table 1).

This first education credit to Bangladesh was followed by two additional credits. Credit 87-PAK for US\$ 13 million was signed in 1966, and was largely an extension of the first project to provide wider coverage for agricultural and technical education and training through the agricultural university and technical institutes. Credit 407-BD for US\$ 21 million was signed in 1973 and was another extension as well as a legal transfer of the undisbursed portions of the first two projects from Pakistan to Bangladesh, after partition, plus a few fellowships for training abroad, amounting to some 24 man-years, for the agricultural university. There are apparently no large substantive or procedural differences between these three education projects.

The project is located in a country of considerable underdevelopment and of very limited disposable income for investment. The population at 75 million is poor (per capita income at \$60 has not risen over the past twenty years), overcrowded (population density is nearly 1,400 per square mile of the total area and 2,200 per square mile of cultivated land) and becoming more so (population is growing at 3% per annum), short-lived (life expectancy at birth is well under 50 years), in many cases unemployed (perhaps 25-30%), and largely illiterate (under 20% literacy rate). At the time of appraisal, only 2.25% of GNP was spent on education including not only expenditures in the public sector under the Ministry of Education but also under other ministries and in the private sector, as compared to roughly double this figure in other Asian countries. USAID reportedly financed about three-quarters of all non-recurring expenditures in this sector. Less than 12% of public expenditures was spent on education, in contrast to about 16% of the government budget allocated on the average by developing countries to this sector.

The education system has provided for (a) five years of primary education; (b) three years of lower secondary education; (c) two years of upper secondary education; (d) two years of intermediate education, either general or technical; and (e) two to five years of higher education in university or professional courses. (See Chart). Instruction up to the end of secondary schooling has been in the vernacular, with English as a foreign language; thereafter it has been in English. Non-government schooling facilities have accounted for 8% of primary and 96% of secondary education. Tables 1-4 describe enrollments output and financial performance of the educational system of Bangladesh from 1960 to 1970. Since the time of project appraisal, Government officials in the ministries concerned have been of the opinion that, in general, education and training have not been responsive to the socio-economic needs of the country, and have placed too much emphasis on formal theoretical education, especially in urban areas, thereby creating a stock of unsuitably trained graduates who must wait a long time before finding employment.

## II. THE PROJECT

The project consists of the construction of buildings, purchase and installation of equipment for the establishment or expansion of facilities at the agricultural university at Mymensingh, for technician training at eight technical institutes, and for provision of expatriate personnel and training grants for a technical teacher training college at Dacca (See Map; Tables 6, 7).

The project monies allocated to the agricultural university were to assist in financing equipment for and construction of classrooms and laboratories for the faculties of agriculture and veterinary science, a teacher student center, a central library, an administration building, a convocation hall, farm buildings, and three student hostels. Although the university had originally requested IDA to consider its entire master plan, only those parts of it which had cost estimates based on preliminary drawings and specifications were considered. This, together with the prior and relatively intensive involvement of other external agencies -- namely, USAID and the Ford Foundation -- in project institutions, appear to have been the main criteria determining the eligibility of the various items for inclusion in the IDA-defined project. IDA, in line with its policies at the time, defined the project in terms of financing buildings and equipment and it left the more substantive aspects which dealt with instructional programs to these other agencies. The portion of the total university represented by the project was approximately one-third of the teaching space, three-quarters of the general buildings, all of the farm buildings and two-thirds of the student residences. Staff housing was not included because its standard of accommodation, although following the prevailing practice of all Government agencies, was not considered sufficiently economical by the appraisal mission. Equipment and furnishings to be procured under the IDA credit were limited to those required for the buildings to be construction under the credit. No project monies were

allocated for the construction of the technical institutes, which was financed by the Government, but the project financed their instructional equipment. To provide staffing for all these technical institutes, the project also financed an accelerated technical teacher training program, including the temporary services of foreign teachers and overseas training of their Bengali counterparts.

Total project costs were estimated at US\$ 9.0 million, and expenditures in foreign exchange at US\$ 3.1 million. The US\$ 4.5 million development credit was applied to the payment in full of equipment costs at the technical institutes and the agricultural university, and of the personnel costs of the technical teacher training college. The balance of the credit was to be applied to construction costs at the agricultural university. Thus all of the foreign exchange requirements were met from the credit, with the exception of the foreign exchange component of the construction costs of the eight technical institutes, amounting to about US\$ 0.5 million, which were not included since the mission felt that the problems involved in providing end-use inspections suggested that these costs could more appropriately be met by the Government; these costs were indirectly met by the additional US\$ 1.4 million in free foreign exchange which was arrived at by financing 50% of the total cost of the project, instead of the foreign exchange costs only.

In order to assure proper implementation of the project, certain requirements were specified in the project and credit agreements, and in various side letters. First, project administration of the university would be strengthened by the addition of at least one qualified architect-engineer to act for the university in its relations with consulting architects and contractors; and architects acceptable to IDA would be appointed immediately to complete the design phase of the university's development plan. 820 acres of land would be transferred to the university by the Government. Second, the Government agreed to employ an equipment specialist acceptable to IDA, for a period of two years, to advise the Directorate of Technical Education regarding the selection and installation of equipment to be purchased under the IDA credit. Lists of equipment to be purchased for the technical institutes would be revised with the advice of the equipment specialist, and the revised lists would be submitted to UNESCO or some other qualified agency acceptable to IDA for review. A full-time qualified project director would be appointed in the Directorate of Technical Education. Third, the Government would appoint consultants acceptable to IDA to implement the technical teacher training program, and it agreed that beginning September 1964, it would expand the combined enrollment of the teacher training college to not less than 125 trainees and by September 1965, continuing through 1968, to not less than 150 trainees (Table 9). Fourth, the Government would properly maintain, repair, and renew the physical plant and equipment of project institutions. Fifth, the Government would insure all imported goods against all hazards incident to purchase and transportation, and insurance would be payable in the currency in which the cost of goods was to be paid. Finally, the Government would make available to the local authorities all the resources

required for carrying out the project. These agreements were generally complied with except in the following cases, some of which are discussed more fully below. Imported goods were not properly insured. Local currency resources were sometimes not available on schedule. And enrollments at the technical teacher training college never reached anywhere near the levels specified above.

### III. IMPLEMENTATION

#### A. Project Management

The implementing agency in the case of the agricultural university was the university itself which was linked, before partition, to the Provincial Government through its Chancellor, who was the Governor of the Province. The agricultural university had been established in 1961, at Mymensingh, where prior to that time there was a college of veterinary and animal science affiliated to the Ministry of Agriculture. The technical institutes and the technical teacher college were administered by the Directorate of Technical Education, which was established in the 1950s under the Ministry of Education.

A project directorate was then set up within each of these two institutions with responsibility to coordinate the procedural aspects of the project. But the project directorates were not set up to monitor the substantive aspects of the project by means of performance indicators, defined in terms of operating results and manpower impact, or to relate the procedural with the substantive aspects of the project. When the program performance of project institutions did not meet the expectations of the Government and of many project participants (both in terms of their relative remoteness from current developmental priorities and their apparently limited effectiveness in training practically-oriented middle level technicians), the project directorates were not constitutionally or technically able to analyze critically project performance and to formulate measures for improving it. Consequently, the project directorates were not always effective institutional mechanisms to ensure an administrative commitment from the local authorities for the implementation of the project within the specified time schedules, and to secure adequate resources from the budgetary process for its operation.

At the university, the project office was a separate entity responsible to the Vice-Chancellor, and was staffed to facilitate communication with IDA and the procurement and administration of the credit; stores accounts and all university development work were under the jurisdiction of the Treasurer and the Planning and Development Committee of the university. Contracts for construction were prepared by the consulting architects so as to permit international competitive bidding, and were sent to IDA for comment before they were issued. Equipment lists were prepared with the assistance of Texas A & M consultants, also in such a way as to

permit international competitive bidding. Equipment lists for the technical institutes were based on uniform lists prepared in 1961 by a technical Education Standardization Committee, and revised in the light of experience since that time. An equipment specialist from Oklahoma State University, sponsored by the Ford Foundation, advised on the selection and installation of equipment to be financed, and UNESCO reviewed the equipment lists so as to assure that specifications were written suitably for international bidding. IDA's approval was required for any individual item which cost more than US\$ 10,000.

The substantial efforts which were devoted by IDA supervision missions to help complete the procurement of equipment left little scope to deal with the subsequent phases which involved major delays and deficiencies in its installation, operation and maintenance. When the amount of time required from IDA personnel to administer the regulation of equipment purchases proved to be excessive, IDA confined itself to occasional monitoring and placed upon Government officials, namely, the project directors, the responsibility for ensuring that equipment purchases were substantially in accordance with the master lists. Each project director was then asked to enclose with each group of withdrawal applications a signed certificate stating that all items shown conformed to the master lists both in quantities and in prices. A permissible variation of not more than 25% from the estimated unit prices with the master lists was agreed upon, and it was subsequently raised to 40%. Inadequate records do not allow a direct comparison between items that had been indented, ordered or received, and the items prescribed in the master lists of equipment.

The procurement of building materials and instructional equipment had to be carried out through the national Supply Directorate, a procedure which took about 13 months to follow through several stages including clearing and translating indents into bid packages, preparing tenders and tendering periods, analyzing and accepting tenders and clearing them with the Finance Department, and delivery from suppliers to port and to site. Repeated visits by IDA staff gradually streamlined these processes. In 1965, the university was granted the authority to procure materials and equipment directly instead of going through the Supply Directorate, and a special liaison officer was appointed to accelerate procurement procedures for the technical institutes. Yet the delays which eventually materialized in the implementation of the project cannot be attributed to any large extent to a cumbersome civil service machinery, since it could have been possible to plan procurement for the project on the basis of a 14-month time interval between indents leaving the project directorates and goods arriving on the site; even indents for building materials could have been placed well ahead of the completion of final specifications on the basis of approximate quantities prepared by the consultants for the project office. These delays may well be more indicative of the secondary priority given by the central authorities to the implementation of the project when they did not have sufficient assurances that project output and performance were vital instruments for solving their current and medium-term bottlenecks in agricultural and industrial development. They are also indicative of a budgetary process

quite sensitive to these priorities, and a structure of financing differentiated in terms of relative scarcities between capital and operational expenditures.

In broad terms, capital expenditures for buildings and equipment derived from the Five-Year Plan which was drawn up by the Planning Commission of the Central Government. The funds for capital expenditures which the Central Government then made available to the provincial Finance Department rested on a relatively buoyant source of funds, namely, income and excise taxes. When it came to recurrent expenditures, on the other hand, project institutions were dependent on the Provincial Government and its relatively poor land tax base. The difficulties of providing for the recurrent expenditures, evident in some empty or inadequately used buildings, underpaid teachers, idle machinery for lack of staff, maintenance, or spare parts, are traceable partly to the structure of finance and its different tax bases and, more particularly, to the relatively high levels of recurrent expenditures required by these capital investments and the correspondingly high opportunity costs attached to them by the central authorities which did not consider them indispensable to increased efficiency. For instance, while average recurrent costs per student per year were Rs 20 for primary education and Rs 80 for secondary education, they were about Rs 1,600 for the technical institutes, nearly double the cost of other forms of post-secondary education (Table 4). Consequently, although IDA was anxious to ensure that project institutions would receive the necessary support from the central and provincial governments, it is not surprising that the resources required were sometimes tardy, insufficient, and reluctantly given.

#### B. Delays and Costs

Estimated completion dates for the three main components of the project were 1966 for the technical institutes, 1967 for the agricultural university, and 1968 for the technical teacher training college. By these dates, only 49% of the total funds allocated to these subprojects had been disbursed: 33% for the technical institutes, 52% for the university, and 66% for the technical teacher training college. Table 5 shows disbursements by IDA for construction, equipment and training. The execution of the project was somewhat more advanced than the corresponding disbursement figures indicate during the first two years of implementation, and it lagged behind them during the later stages. Project expenditures for the technical teacher training college were terminated in 1968. At the agricultural university, most of the buildings were completed and the equipment procured by 1970, with the exception of the convocation hall which is scheduled for completion by 1975. Procurement of equipment for the technical institutes was not completed before 1972 although all the buildings were ready to receive the new equipment supplied by the project, and standard workshops and laboratory layouts had been prepared by 1967.

The slow rate of disbursements relating to the agricultural university and technical institutes subprojects is attributable to several factors. To begin with, the institutional difficulties involved in establishing the

agricultural university and the length of time initially taken in appointing project directors and for them to become properly briefed in their duties and fully effective led to inefficient financial administration. For instance, although one-third of the construction components of the project had been completed by 1965, only about 10% of the corresponding credit had been requested. Unfamiliarity with procurement and withdrawal applications and insufficient confidence in adopted curricula led to substantial delays in ordering equipment for the university and the technical institutes. By 1964, shortages in local currency financing brought construction at the university virtually to a standstill, until 1967, when shortages were somewhat alleviated at IDA's insistence, but construction could not be resumed because of lack of building materials due to the absence of a project director, for over 16 months, to organize their procurement. Emergency supplies were arranged and stockpiled and construction resumed by 1968, but the limited availability of local currency funds, and the prevailing uncertainty as to the effectiveness of the educational programs of project institutions continued to check the pace of project execution.

Tables 6 and 7 summarize actual versus estimated project costs, and indicate the distribution of financing over major categories (construction, equipment and training) and between foreign exchange and local currency costs. Although construction and equipment costs have increased by about 20-50% over the disbursement period, these increases were not reflected in the cost of the project as defined above since cost overruns have apparently been absorbed partly by charging them to other sources of financing, and partly by reducing the quantity and/or quality of the project items. The architects, for example, had reportedly reduced planned areas and site development works to keep within the budget. The records available, unfortunately, are not sufficient to ascertain the extent of cost overruns in an operationally more meaningful manner, namely, on the basis of comparing the cost of the actual against the projected quantity and quality of construction built and equipment installed. Systematic and practical procedures for the effective supervision of equipment purchases for educational projects are apparently still lacking within IDA.

### C. Buildings and Equipment

The project appraisal mission had not been very enthusiastic about the possibility of financing educational equipment, since IDA was quite inexperienced in its administration at that time. The Government, on the other hand, had apparently directed its efforts towards construction on the assumption that IDA would operate largely in the field of equipment financing and that it should be forehanded in having the buildings ready to receive the equipment. IDA eventually faced up to the procedural aspects of the equipment problem and the proportion of financing finally allocated was 47% for equipment, 42% for construction, and 11% for training. The participation of IDA financing in the construction of the university was secured by the local authorities to ensure a commitment by the Central Government -- through the provision of local currency financing -- to the completion of the master plan

of the university. A similar commitment was not considered vital in the case of the technical institutes because their construction was well under way at the time of appraisal.

The financing of construction was consequently confined to the agricultural university where IDA approved the selection of architects and their contracts with the university. The construction work was carried out by local firms on the Government's approved list. Letting and administration of contracts was handled by the Public Works Department, but the supervision of construction was handled by the architects. Architectural and site planning there had first been entrusted to the firm of Berger & Associates; this firm produced a master plan and architectural plan for student hostels and staff residences on which construction was started in 1962. By the end of that year, responsibility for planning a part of the academic and other non-residential buildings was given to the local firm of Noon & Qayum, and by mid-1963, they delivered preliminary drawings, siting plans, specifications, cost estimates and tender documents for three of the six major structures assigned to them. Three other professional firms were involved with the farm buildings, site development and electrical installations. By the time the credit was signed in March 1964, construction of about a third of the project had been started.

It soon became apparent that these buildings were of a poor standard of design, detailing, workmanship and finish, although they were average by local standards at that time. This was due to the unfavorable climate generally prevailing in this region coupled with the paucity of accredited architects the country had ten years ago. Most of the modern buildings constructed were designed by engineers. The type of construction obtained has been structurally sound, of course, but poorly adapted to the local tropical conditions of pervasive humidity which erodes construction materials and increases building maintenance costs. In 1966, the design and supervision of the further expansion of the university under the following credit were placed under the overall direction of a foreign firm of international reputation, Paul Rudolph & Associates, which was commissioned to produce a new master plan for the development of the university campus, and the foreign exchange cost of preparing this master plan was financed by the project. This firm later proposed an able solution to difficult architectural and planning problems fixed by the climatic conditions previously referred to and the nature of a site dissected by a railway line, with scattered buildings which had been allowed to spread over it at the expense of farm land. The proposed land-use pattern grouped built-up areas into compact clusters with, in between, agricultural open spaces linked to the farms. However, the substantial fees (about US\$ 0.25 million) eventually implied by retaining international firms of this stature, relative to available foreign exchange resources, were subject to some controversy.

The maintenance of the physical plant of the university was reportedly rather poor over the last ten years and expenditures allocated

for this purpose were very inadequate. Completion certificates for most of the buildings were withheld by the project director until late 1970, due to the unsatisfactory performance of the first group of architects and contractors. It is somewhat disappointing that the project could not institutionalize more effective operation and maintenance procedures to safeguard the substantial capital investments undertaken, and to ensure the orderly development of the master plan of the university which IDA sponsored through two further stages. A subcomponent of the project originally conceived along these lines could well have been the pilot phase and nucleus of a badly needed national program in building repair and maintenance. The case of the construction industry in Bangladesh moreover suggests that IDA financing for research and development of new building materials suitable to tropical climates, based on local resources, and adapted to the requirements of the modern sector, would probably yield very high efficiencies not unlike similar research for new seed varieties in the agricultural sector.

#### D. Program Performance

##### 1. Sectoral Background

Since the project is oriented towards agriculture and industrial education, instead of general primary and secondary education, it is essential to outline briefly at the outset the structure of the sectors concerned in order to place project design and performance in their proper perspective.

The agricultural sector dominates economic activities and developmental prospects. 95% of the people live in the rural sector, 60% of them are locked in subsistence agriculture. Although 75% of the labor force is engaged in agriculture, the country is not self-sufficient in food production and must import about 15% of its food requirements even in years of normal production. Because there are only marginal possibilities of expanding agricultural land, the fivefold increase in farm output which is needed by the year 2000 just to meet internal demand depends almost exclusively on improved productivity from existing farms, which average about two acres. About 90% of the area under cultivation is in rice, and alleviating food shortages depends in large part on dramatic increases in the productivity of this crop. Increasing the efficiency of jute production is also critical for exports earning. The imperatives of growth in production, utilizing such labor-intensive methods as will promote rural employment and development require the implementation of a series of programs giving first priority to quicker high-yielding projects and secondary priority to lower-yielding projects requiring longer gestation periods. These series of projects includes high-yielding seeds production and distribution; input packages comprising seeds, fertilizers, plant protection and improved draft animal power; low lift pump irrigation and small drainage improvements; minor to medium size drainage works; and tubewell irrigation.

The types of education and training which have a high priority in this sector emphasize the development of non-formal education and training schemes with particular reference to rural development programs, training

of agriculture extension workers, farmer training and simple rural vocational training. For the last ten years, most of this type of extension training as well as the bulk of research for new seed varieties have been carried out outside the agricultural university and with little institutional support from it.

As far as the industrial sector is concerned, the short history of industrial activities in what is now Bangladesh has been influenced by two preponderant factors. First, lack of resources other than water, some agricultural and forest raw materials, natural gas, and a large unskilled labor force; and, second, the peripheral status of the area as related first to the emerging centers of West Pakistan and then to the big Indian manufacturing agglomerations. Bangladesh has had among the lowest levels of per capita production and consumption of industrial goods in any country. The industrial sector accounts for 8% of GDP, 6% of employment, and 50% of exports, where more than half of manufactured exports are jute products; others include tea, paper, matches, and semi-processed items like tanned leather and timber. Jute accounts for over a quarter of total industrial output and over 40% of total industrial employment. About two-thirds of all industry is agro-based, and the small-scale sector contributes up to 60% of the value added and 80% of employment. After partition, in 1947, tea processing and cotton cloth manufacturing were the only two industries of any substantial size. Several industries were then established in the mid-fifties including wearing apparel and footwear, paper, electrical equipment, cigarettes, furniture, leather and rubber goods and metal products. More industries were established in the sixties including fertilizer, steel plants, and chemical, pharmaceutical and engineering factories.

During the last decade, this industrial sector has been beset by a number of difficulties. The productivity and profitability of industrial enterprises have been generally low, and their financial position precarious due to prolonged low production or sales levels, accumulation of charges on capital, excessive and unproductively used short-term drawings from the banks, and price policy constraints. Accumulated spare parts, components, and accessories requirements have become an important issue for almost all industries, and many productive units have remained closed, or operate at reduced capacity due to difficulties in providing spare parts after prolonged periods of neglect and poor maintenance of machinery. Inadequate transport, power supply, engineering and servicing facilities, working capital, marketing and applied research have been a major problem for many industries. Industries have also been short of general managers and organizers, economic analysts, higher level accountants, and marketing specialists. Finally, labor disputes have developed into one of the most serious constraints on production, and the performance of public sector industries including the major part of large-scale industries has been poor. These problems were further exacerbated after 1971, after the breakdown of inter-industrial and market linkages with West Pakistan and the departure of a number of top managers and skilled workers.

The types of education and training which have been identified as high priority for this sector relate to upgrading managerial personnel for nationalized industries and services, and training skilled technicians also for other intermediate and small-scale industries. The project was appraised in a period of industrial expansion; value added between 1960 and 1965 increased by 225%, while the corresponding figure between 1965 and 1970 is only 12%.

## 2. The Agricultural University

The establishment of the agricultural university grouped all higher agricultural training in the country, including faculties of agriculture, animal husbandry, veterinary science, agricultural engineering, fisheries, economic and rural sociology, and departments of agricultural education, extension, and basic and social sciences. In the absence of proper preparation for agricultural study in the intermediate colleges, the university enrolled its students after the matriculation examination and offered a five-year course leading to the B.S., which it recently revised to a four-year course. Advanced studies for the M.S. were subsequently offered. It was also planned that the university would undertake research in addition to its teaching program, and would make a valuable contribution to the work of the national research institutes in this field and to the much needed teaching staff required to introduce agricultural subjects into the curricula of primary and secondary schools. Extension training was to start in 1963 and be expanded to a full-sized program by 1965. Classes in extension organization were to begin by 1964. Agricultural education teachers' courses were to begin by 1965. However, teacher training and agricultural extension activities were very limited.

In seeking IDA's assistance in financing higher agricultural education, the country had expressed the desire to give a more practical bias to its general education, which in parts has been excessively bookish. Since IDA had not yet accumulated much experience in this field at that time, it envisaged that advice and cooperation concerning the non-physical aspects of the project would probably have to be obtained from other more competent sources. As far as the university was concerned this role was left to USAID and its consultants from Texas A & M University. In order to give a more pointed impact to its aid program, USAID had attempted to define certain operational goals -- such as a given increase in rice production over a specific period -- upon which it wanted to concentrate, and towards which its various assistance programs, including those to the agricultural university, were to be oriented. IDA, on the other hand, kept out not only of operational objectives but also apparently of any involvement in, or supervision of, the program content of the agricultural university. This orientation seems to have been set by the appraisal mission, which did not include an agricultural educator, and it was closely adhered to by the subsequent supervision missions over the following ten years. With one exception: six years after project appraisal, in 1968, a consultant was sent to review briefly the curriculum and training of the agricultural university.

The consultant noted that the undergraduate curriculum was based on generally sound principles, but that instruction was too theoretical and foreign textual material was not adapted to the local context. Extension work was very limited. Practical activities were confined to laboratory or demonstration and did not include field work. The university post-graduate programs, which were still new at the time, comprised mainly research work and formed the main bulk of the university research programs. The themes of the students' research projects were generally relevant to the national agricultural context but were seldom linked to larger research, extension and production agencies and commodity research organizations, a situation which resulted in unnecessary duplication and insufficient relation to the urgent national requirements of agricultural development. No corrective action was taken on the basis of that report since, as previously noted, instructional programs were not part of the IDA-defined project, their design and supervision having been left entirely to USAID. Some improvements appear to have taken place since that time.

In 1970, the leader of the Texas A & M consultants team made a comprehensive review of the development of the university and concluded that although much had been accomplished still much more needed to be done to assist the country in having the type of institution vital to its needs. He noted that there has been little development of a coordinated research program, and that the selection and supervision of projects were largely departmental in nature and did not represent a team approach to meet fundamental needs. An organization resembling an agricultural experiment station was badly needed. Basic sciences were very weak and students were not getting adequate training in them for the B.S. and M.S. degrees. There was too much absenteeism on the part of instructors and little accountability to the administration. Student absenteeism was also too high with little or no penalty for absences. Student demands were for elevated status and increased pay upon entering government service, and for changes in recruiting policies, and the university administration was, of course, helpless in meeting them, because they involved other government agencies. Reforms were also needed in the examination system. The leader of the Texas A & M consultants team also reported in his final report to USAID that the chief of the Examination Evaluation Branch of the Dacca Board of Examinations had determined from a critical study of several successive years' questions that there is usually a set of two or three dozen broad questions from which 80% of the questions are selected every year. Since many alternative questions are included, a few difficult questions can be omitted by the examinees without harm. So that many questions can often be predicted with the result that dozens of question-answer books, written by test-conscious experts, flooded the market. Average and below average students had discovered that it was far more profitable to memorize these question-answer books rather than study the class textbooks or be involved in laboratory demonstrations and field experiments. However, the agricultural university does not consider that the comments made by the Examination Evaluation Branch are justified, since this body does not have jurisdiction over university examinations. Adoption of unfair means in examinations has been also reportedly common.

An assessment of the quality of the personnel trained by the agricultural university in terms of their effectiveness in their respective

fields is beyond the scope of this report, but it is important and should have been a matter for past assessment in view of the continuous dissatisfaction expressed by the Ministry of Agriculture for the type of support it has received from the university. Substantial efforts have been undertaken by the university to improve this situation, but these efforts have not always received adequate support from other responsible agencies. A systematic evaluation of the content and quality of administration, instruction, research, and extension training should be made. The review should also analyze the critical functional relations of the university with the Ministries of Agriculture and Education and with the budgeting process.

### 3. The Technical Institutes

The development of the technical institutes has its roots in the work of the Technical Education Committee, which was undertaken in 1949 shortly after partition. The Government's overall objective was to encourage economic development and to raise the standard of living through rapid industrialization. A major objective, therefore, was the servicing of industry through the production of trained personnel. Manpower was the country's greatest and most obvious resource, and the purpose of technical education was to make it more economically effective. The Government, moreover, regarded such a program not only as a service but as a stimulus, the hope being that the training of large numbers of skilled people would somehow contribute to industrial development.

The Technical Education Committee had developed a system in which the range of training for the skills required was to be integrated with the rest of the national education program. There were to be part-time courses to improve the skill of workers in small-scale and other industries, trade and artisan schools to introduce a technical bias in secondary education, technical institutes to produce the supervisors of skilled workers and professional colleges for engineers and technologists. The technical institute was conceived as an institution catering to a variety of courses ranging from full-time graduate and post-graduate courses to part-time courses for industrial workers and others. It was to provide training in any vocation for which there was a demand, be it engineering, industrial, commercial, etc., or useful general trades like tailoring, bakery, etc. Thus it had to adjust itself according to the needs of the industry and its progress was to depend upon the industrial development of the country. The Ford Foundation then financed buildings, equipment, and training costs to develop the program and it contracted Oklahoma State University, in the mid-1950s, as a backstopping agency to prepare equipment lists and provide advisory services. The IDA-financed technical institutes are essentially an extension of the system which was developed and sponsored by the Ford Foundation and its advisors.

For the last ten years, however, there has developed a coherent critique of the technical institutes from Government and Ford Foundation officials, from educators and industrialists, from technical institute staff and former students. The most significant criticism of the technical

institutes was that they were not meeting the most essential needs of the country which, in the field of technical education, were for training skilled workers who could help to reduce the cost structure and improve the quality of manufactures to help meet local requirements and gain export markets. Instead, the technical institutes trained a white collar technician. Students were enrolled on a full-time basis and were recruited directly from the ranks of secondary school graduates. Instructional programs were basically similar to those designed in the 1950s, and they related poorly to industrial requirements. Finally, little, if any, part-time teaching for industrial workers was undertaken. And whereas the curricula of the technical institutes provided for some 70% of contact hours to be practical laboratory work, little practical work was actually undertaken, so that their diplomates were academically oriented and remained remote from local industrial experience, they had inadequate practical knowledge, a training irrelevant to any specific job, an inability to apply theory in practice and a lack of confidence in handling machines.

The weakness of the practical component of the technical institutes was generally viewed by its critics as a result of inadequacies in the teacher training program. Yet it appears that the background and training of both staff and students militated against practical work itself. Essentially, students were drawn from a very elite minority. To be literate in Bangladesh in the mid-1960s put one among the top 15% of the population; to pass matriculation was an achievement limited to less than 75,000 a year. These candidates had succeeded in book learning and were technically as well as socially unsuitable for a course emphasizing practical training. One way out of this difficulty may have been to express entry qualification more in terms of industrial experience. Similarly, entry requirements for the teachers were very academic and less relevant to the practical purposes of the program. Teachers were recruited directly from among the ranks of the diplomates, never acquired industrial experience, and while the project had stressed that the success of the technical institutes would depend to a large extent on the effectiveness of the teacher training program, only about 250 teachers were trained as compared to 1,100 projected between 1963 and 1970, (Table 9), and the practical component of their training was reportedly as generally neglected as that of the students. In the prevailing system of incentives the highest levels of attainment are apparently theoretical and remote both from industrial need and from manual work, so that everyone, from students to professors, associated status with theory and avoided manual work.

Another general and major criticism of the development of technical institutes has been that the system was expanded beyond effective demand with the consequence that the employment prospects of their diplomates has been worsening: from 25% to 50% of the diplomates in any given year might be unemployed 12 months after graduating. Unemployment periods increased and starting salaries decreased from 1965 to 1970. <sup>1/</sup> Yet there did not seem

---

<sup>1/</sup> Ritzen, J. Technical Education for Development. A Case Study of Polytechnics for Bangladesh. Berkeley-Bangladesh Program in Educational Planning, 1972.

to be a stock of long-term unemployed diplomates building up since, presumably, a kind of queueing system existed in Government and semi-public agencies where most diplomates were employed and from where they helped recruit their friends most senior in their unemployment period.

Still, in spite of what appears to be a general consensus on the oversupply of diplomates, the analysis of their prospects for employment should also be viewed in the context of the general levels of unemployment for the rest of the labor force, and of the general levels of idle capacity prevailing in many industries. There are no indications that diplomates are doing worse than, say, engineering graduates, although it is clear that they are markedly better off than most people in the population. On the average their starting salary was roughly equal to what most workers in industrial firms got. <sup>1/</sup> But more revealing in terms of the value of technical institute education are comparisons with alternative ways of equipping people for work at this level. The structure of local medium and large-scale industry is such that, in many technical fields, employers can use graduate engineers or matriculates as effectively as diplomates in filling a given job. The whole small-scale industry sector has assumed a large share of industrial and rural development without having recourse to the technical institutes. Larger-scale firms apparently prefer to upgrade workers from lower levels and to devise their own training schemes where workers would gain salary increments as a function of specific job skills effectively mastered.

#### E. Manpower Requirements and Policy

The expansion of the agricultural university as outlined by some selected indicators is quite impressive (Table 8). In 1962, the faculty totalled 52 members with 6 Ph.D.'s and 20 M.S.'s. About two-thirds of the 405 students enrolled were carryovers from the earlier college system and only 15 students of the old group graduated with a B.S. degree in that year. No degrees beyond the B.S. were given. By 1968, the faculty was increased to 151 members with 35 Ph.D.'s and 89 M.S.'s. Half of the faculty had received their degrees from foreign universities. About 1,300 students were enrolled, including 150 graduate students. The graduating class included about 110 students receiving the B.S. and 90 the M.S. By 1971, the faculty had reached 240 members, enrollments 1,800 students, and graduates 240 diplomates. Still, it appears necessary to make a specific assessment of national agricultural manpower needs in order to orient the university to the role it must assume in meeting them, be they in highly skilled research workers and extension trainers or in low and middle-level technicians. Although it was recognized at appraisal that the greatest need was for middle-level technicians and extension workers, and while the Government has been seeking to tie the educational system much closer to

---

<sup>1/</sup> Rahman, M.A. The Analysis of Relative Wage and Salary Structure in Pakistan, United Bank Limited, Karachi, 1970.

development priorities and their corresponding manpower requirements, the progress of the agricultural university -- useful as it is -- does not sufficiently correspond to the priorities sought and to the skills which have been severely lacking in the past and are so critical to future development.

If the numerical growth of institutions, students and diplomates is the criterion, then the development of technical institutes in Bangladesh has also been a success. In 1961, there was one technical institute with 750 students; by 1970, there were over 16 technical institutes with more than 7,000 students. The number of diplomates increased from about 200 per annum to nearly 1,500 over the same period. The IDA-financed project accounts for about 30% of these totals and, together with the five additional institutes financed by the following project, IDA 87-PAK, it would amount to 57%. One should still note, however, that actual enrollments and output compared disappointingly with projected figures. For the eight technical institutes financed by this project, actual enrollments and output for the period under review amounted to little more than half projected figures (Table 9). Wastage rates at 50%, although high, are apparently not appreciably above those of similar institutions in other countries concerned with technical education. But the unemployment record of the graduates and the lack of sufficient indications as to their critical necessity must call into question whether Bangladesh actually needed such numbers of this type of qualified personnel and whether the opportunity cost of producing them was not too high. It is probable that some form of direct industrial training would do more effectively, cheaply and quickly what the technical institutes are trying to do.

In addition to the overall imbalance created, whereby the supply of this particular type of trained manpower exceeds the apparent demand for it, the technical institutes have been faced by a structural imbalance in wages. The prevalence of unemployment in Bangladesh naturally induces people to put a very high premium on secure jobs particularly those in Government from which dismissal is rare. Since Government scales embody substantial differentials in favor of managerial and administrative occupations as compared to those which are practical, professional and technical, these differentials account to some significant extent for the demand for an education which is of lower priority for development, for the singleminded concern to qualify for white collar jobs, and for the continuing pressure to expand this system, even after educated unemployment has become severe.

A situation in which the types of work which graduates from the technical institutes are willing or able to do does not match the pattern of opportunities available inevitably over-encourages waiting for the desired jobs until the numbers are well beyond those the occupations concerned can absorb, and substantial pressures are initiated to absorb them in the civil service. The adjustment processes which are then set into motion are slow and painful, including far-reaching reforms in the educational system and in the structure of incentives. Changes in the structure of incentives of the magnitude required are not possible without greater and tougher action

by the Government, including the revision of its own salary scale. This revision is presently under consideration, but it is particularly painful because it has to take place in a period where there is not much room for increases in consumption; since the newly employed will raise their consumption a good deal, the compression in the structure of earnings must imply some decline in real salaries at the top. Changes in the educational system, on the other hand, are more within the reach of the project but they entail a significant measure of flexibility in order to cope with the constraints placed on the other instruments of policy. The overall and structural imbalances can be checked at least by limiting the expansion of the system or, at best, by widening the types of training provided and of candidates recruited.

#### IV. CONCLUSIONS

The project has made a valuable contribution to the establishment and expansion of the agricultural university and of the embryonic system of technical institutes in Bangladesh. Increases in the size of these institutions in terms of enrollments and graduates have been impressive, although they amounted to about two-thirds projected figures (Table 9).

The completion of building construction and equipment procurement took twice the time originally anticipated. Unit project costs correspondingly increased anywhere from 20% to 50%, although total actual costs are below projected costs since actual quantities are somewhat smaller than originally specified: the convocation hall had not been built by the time disbursements were suspended and its cost was included in the following project; the amount of technical assistance disbursed for the technical teacher training program was lower than planned by a third; and the quantities of equipment purchased were reduced to keep within budgeted funds, but it was not readily possible to determine the extent of these reductions from available records.

These delays in themselves do not appear to have substantially affected project performance. Student enrollments at the agricultural university could not have been expanded at a faster pace without significant reduction in the quality of its graduates; and although the number of students graduated by the technical institutes is only about half those projected, effective demand for them is lower than available supply. Instructional programs were not constrained by insufficient space and equipment, the case being rather that available facilities could have been more intensively used, and that equipment purchased has remained to some large extent idle and poorly maintained.

A review of the project should not lose sight of the general difficulties prevailing over this period -- institutional difficulties involved in establishing the first agricultural university and in expanding technical education, financial difficulties related to securing adequate

local resources in the context of a very tight budget, logistical difficulties based on poor transport and communications, and political difficulties affecting the economic and social fabric of development. These general complications were not relieved by the very limited institutional building component of the project in terms of operational management and maintenance, university and institute administration, and program designs and monitoring. These difficulties could have been overcome and the project could have been implemented within the specified time schedule if the central authorities could have been able to consider that the performance of project institutions was critically effective in meeting the current and medium-term requirements of industrial and agricultural development. But this was not the case, due to several factors, some of which have been under the control of project institutions, while others have been outside of it.

The performance of the technical institutes has undoubtedly been affected by the relative stagnation of the industrial sector, and by an imbalance in the wage structure which has allowed the particular type of candidates who are admitted to the technical institutes to orient their training and careers away from the practical skills which are critically missing. The formulation of an agricultural investment and development strategy, prior to independence, was a very sensitive matter and one involving considerable controversy and political pressures. It was natural, therefore, that a large part of the faculty sought to steer away from any involvement in sectoral policy issues which inevitably develop into risky political debates, until the institutional viability of the university and their personal positions were more firmly established. Yet, if these external pressures have affected the performance of project institutions they do not fully justify their limited effectiveness. They do not explain why the technical institutes did not attempt to fulfill their practical vocation by changing their recruitment policies and their examination procedures, and why they did not adapt to the changing pace of industrial expansion by widening the range of technical training provided. In a country of the size of Bangladesh, and with the low stocks of technical know-how which have been generally prevailing, it would seem that there would be considerable scope for a very effective utilization of the some 25 technical institutes scattered throughout the country. Similarly, in the case of the agricultural university, political pressures are not sufficient to explain the weakness of the basic curricula, and the inadequacy of the training provided for dealing with the operational and implementational aspects of agricultural development.

While it is beyond the scope of this project audit to determine to any definite extent the reasons accounting for the limited program performance of project institutions, it appears that this limited effectiveness could be accounted for to some significant extent by the definition of the project in its design and supervision which has focused on means rather than on ends. The lack of any monitoring in terms of the objectives to be achieved and in terms of the efficiency of the methods used in pursuing them did not effectively guide the development of project institutions in

accordance with national developmental priorities. Neither did it help to generate adequate technical and administrative program adjustments and support which could have more directly related the program of project institutions with the needs of the industrial and agricultural sectors. The limitation of IDA to the hardware aspects of the project, with practically little supervision of the substantive aspects of institutional performance, has probably limited its contribution and effectiveness. The substantial underutilization of the equipment financed is perhaps the most obvious example of this limited effectiveness. Coping with such a situation suggests a number of possible alternatives which may be worth further study and experimentation.

First, even if the institutional, technical and program assistance components of the project were the responsibility of other foreign agencies such as USAID or the Ford Foundation, it may still have been essential for IDA to implement, either independently or in collaboration with these agencies, a project monitoring system which could reliably measure the effectiveness with which certain objectives are being pursued, and which would be capable of suggesting appropriate technical and administrative adjustments when required. These objectives should be eventually defined in operational terms, for instance, relating to increases in agricultural or industrial efficiencies. Specifically, in the case of the technical institutes, it should have been possible to determine which potentially growing and technically-based industries would require the services of what number and type of graduates, to identify the levels at which training could significantly improve the performance of those industries, and to set up training at these levels in direct collaboration with industry. As it was, by having defined the administrative policies of the educational system and its impact on educational performance outside its scope, the project allowed prevailing recruitment policies to couple with an unfavorable wage structure and defeat the practical orientation of the program.

Second, it would have been useful to encourage a certain amount of flexibility and variety in the exploration and adoption of various alternatives to achieve the desired objectives. Such differentiation in the means would have allowed for smoother adjustments to changing and complex circumstances which could not have been foreseen during project appraisal. In the case of the technical institutes, the transfer of a given type of skill would have probably been more effectively carried out through a variety of measures, such as sandwich programs, on-the-job training, part-time courses, and peripatetic teachers, rather than exclusively through full-time courses. A possibly more effective utilization of the capital investments and skilled manpower located in the technical institutes could have been achieved by enlarging their role to include, for instance, the development and promotion of intermediate technologies. So that the technical institutes would not only service industries but they would also stimulate the growth process by selective borrowing from technologies developed in other parts of the world, doing preliminary testing on known equipment, adapting it to local conditions, and developing prototypes for demonstrative purposes. Similarly, the performance of the agricultural

university could have probably been considerably improved if its organized research and extension services had been much larger and more closely integrated with teaching.

Finally, since IDA has been substantially involved with the agricultural sector of Bangladesh, its institution-building contribution to the agricultural university could have been significantly increased by involving the university in the formulation and implementation of its sectoral studies and projects. In the case where IDA has not been involved with the corresponding sector, in industry, there has been a series of constraints on sectoral development which are probably more binding than the scarcity of skilled manpower, and with which it is essential to cope first before technical education can be effectively used. In this latter case, it would have been probably more effective to integrate technical education into a more comprehensive program of technical assistance to the industrial sector which would be flexibly designed in order to intervene quickly with resources at those points which best promised to secure the required objectives.

BANGLADESH

Table 1 - ENROLLMENTS IN EDUCATION SYSTEM, 1960 - 1970

	<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>
<u>Primary Schools ('000)</u>	333.1	342.3	363.6	385.2	404.4	417.1	n.a.	n.a.	n.a.	n.a.
<u>High Schools ('000)</u>										
Middle/Junior	9.4	10.0	12.3	14.0	14.9	16.5	n.a.	n.a.	n.a.	n.a.
High	438.6	475.1	536.2	618.6	698.9	792.9	n.a.	n.a.	n.a.	n.a.
<u>Other Schools</u>										
Madrassah Education ('000)	235.4	248.9	301.3	379.9	n.a.	523.3	524.0	533.0	542.0	550.0
Adult Education	7,052	7,028	7,830	9,625	12,427	21,890	22,000	22,000	22,000	22,000
<u>Secondary Vocational</u>										
Agriculture	321	322	525	593	425	345	350	375	400	450
Commercial	517	540	687	1,429	134	249	275	300	325	350
Engineering Survey	88	212	-	427	287	101	170	185	200	200
Fine Arts	73	38	32	26	49	230	241	240	275	300
Industrial Tech.	3,362	3,458	2,814	3,869	3,470	6,408	7,400	8,400	9,400	10,500
Medical	708	966	142	n.a.						
Teacher Training	<u>3,024</u>	<u>3,006</u>	<u>3,171</u>	<u>3,893</u>	<u>4,714</u>	<u>5,568</u>	<u>6,400</u>	<u>7,200</u>	<u>8,000</u>	<u>8,800</u>
Total	8,093	8,542	7,371	10,227	11,079	12,901	14,836	16,700	18,600	20,600
<u>Professional Colleges</u>										
Agriculture	486	126	214	216	228	212	220	230	240	250
Engineering	-	-	-	-	122	216	235	250	275	300
Medical	1,130	1,204	1,505	1,629	1,601	1,920	1,950	2,200	2,500	2,800
Commerce	605	729	1,392	2,153	2,160	833	1,000	1,200	1,400	1,600
Fine Arts	121	148	178	165	166	137	150	160	170	180
Law	777	770	841	1,022	1,175	1,965	2,000	2,050	2,100	2,200
Home Economics	-	74	174	183	288	158	170	180	190	200
Education	481	681	889	858	937	1,013	1,100	1,200	1,300	1,400
Physical Education	66	112	133	208	194	117	130	150	170	200
Social Sciences	-	<u>11</u>	<u>30</u>	<u>58</u>	<u>64</u>	<u>92</u>	<u>100</u>	<u>110</u>	<u>125</u>	<u>150</u>
Total	4,587	3,855	5,356	6,497	6,959	6,697	7,090	7,770	8,515	9,330
<u>Arts &amp; Science Colleges ('000)</u>	47.8	59.2	76.1	95.9	112.9	126.0	139.6	175.5	207.8	270.0
<u>Agriculture University</u>	n.a.	444	524	717	721	823	974	1,070	1,160	1,450
<u>Engineering Universities</u>	n.a.	962	1,022	1,064	1,029	1,509	1,296	1,350	1,675	2,250

Source: GOP, Education Index, 1970.

BANGLADESH

Table 2 - OUTPUT OF EDUCATIONAL SYSTEM, 1960-1970

	<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>
<u>Matriculates</u> (Secondary School Certificates)	32,300	46,900	57,300	43,300	50,400	62,700	76,000	90,000	105,000	120,000
<u>Intermediates</u> (Arts, Sciences & Commerce)	8,213	12,839	12,274	15,823	17,730	23,712	30,625	36,200	41,700	47,700
<u>Technicians</u>										
Certificate level	n.a.	n.a.	n.a.	n.a.	122	86	31	164	n.a.	n.a.
Diploma level	n.a.	n.a.	n.a.	n.a.	435	504	539	1,263	n.a.	n.a.
<u>Technical &amp; Professional Graduates</u>	936	1,015	1,592	1,292	1,794	1,819	1,842	n.a.	n.a.	n.a.
<u>Graduates from:</u>										
Agricultural University	n.a.	15	36	54	80	49	41	n.a.	n.a.	n.a.
Engineering Universities	n.a.	207	229	151	237	218	203	n.a.	n.a.	n.a.
<u>Professional Post-Graduates</u>	50	63	52	47	79	84	145	n.a.	n.a.	n.a.
<u>Graduates</u> (Arts, Sciences & Commerce)	4,869	5,285	6,100	6,390	7,185	9,073	10,740	11,800	13,000	14,300
<u>Post-Graduates</u> (Arts, Sciences & Commerce)	893	968	1,060	1,282	1,620	1,903	1,968	2,175	2,400	2,700

Source: GOP, Education Index, 1970.

BANGLADESH

**Table 3 - FINANCIAL PERFORMANCE OF EDUCATIONAL SYSTEM, 1955 - 1970**  
(OO'000 Rs)

	First Plan Alloca- tions	Annual Developmental Expenditure					Total 1955-60	Percentage Utiliza- tion
		1955-56	1956-57	1957-58	1958-59	1959-60		
Primary Education	517	4	7	109	182	173	475	92
Secondary Education	890	7	7	61	61	61	197	23
Teacher Education	149	9	5	8	5	8	35	24
Technical Education	142	3	9	43	44	37	136	96
Colleges	415	13	2	39	43	28	125	30
Universities	289	-	12	12	15	52	91	31
Overseas scholarships	24	-	-	1	-	-	1	5
Social and cultural activities	29	2	3	8	7	13	33	113
Miscellaneous	-	-	14	39	28	24	105	-
<b>Total</b>	<b>2,415</b>	<b>38</b>	<b>59</b>	<b>320</b>	<b>385</b>	<b>396</b>	<b>1,198</b>	<b>50</b>

	Second Plan Alloca- tions	Annual Developmental Expenditure					Total 1960-65	Percentage Utiliza- tion
		1960-61	1961-62	1962-63	1963-64	1964-65		
Primary Education	700	26	67	200	200	180	673	96
Secondary Education	774	89	113	251	200	190	843	109
Teacher Education	303	49	92	69	40	18	268	88
Technical Education	766	61	113	257	280	431	1,142	149
Medical Education	348	71	89	128	203	120	611	175
Agricultural Education	539	5	60	114	123	118	420	78
College Education	249	27	38	99	60	31	255	102
Universities	585	50	93	153	180	140	616	105
Foreign scholarships	30	-	-	3	8	8	19	63
Internal scholarships	300	5	18	55	70	70	218	73
Social and cultural activities	114	8	7	14	20	14	63	55
Special projects	14	2	10	6	20	18	56	400
Miscellaneous	12	-	-	-	-	-	-	-
<b>Total</b>	<b>4,734</b>	<b>393</b>	<b>700</b>	<b>1,349</b>	<b>1,404</b>	<b>1,338</b>	<b>5,184</b>	<b>109</b>

	Third Plan Alloca- tions	Annual Developmental Expenditure					Total 1965-70	Percentage Utiliza- tion
		1965-66	1966-67	1967-68	1968-69	1969-70		
Primary Education	2,500	75	240	295	285	350	1,245	50
Secondary Education	2,600	342	491	504	353	316	2,006	93
Madrassah Education	140	-	-	5	16	16	37	26
Teacher Education	450	9	20	58	66	80	233	52
Technical Education	3,570	205	261	304	420	448	1,638	46
Medical Education	1,241	71	143	139	191	209	753	61
Agricultural Education	580	53	101	95	124	82	455	78
Colleges	510	10	32	43	44	65	194	38
Universities	1,500	128	142	202	242	245	959	64
Scholarships	660	76	83	128	129	130	546	83
Social and cultural activities	90	4	22	31	21	27	105	117
Special projects	260	4	5	19	11	16	55	21
Special areas	-	-	-	-	-	-	-	-
Miscellaneous	-	-	-	-	6	6	12	-
<b>Total</b>	<b>14,101</b>	<b>977</b>	<b>1,540</b>	<b>1,823</b>	<b>1,908</b>	<b>1,990</b>	<b>8,238</b>	<b>58</b>

Source: Final Evaluation of each Five-Year Plan.

BANGLADESH

Table 4 - PER STUDENT CAPITAL AND RECURRENT COSTS (1967/68)

(Rupees)

	<u>Primary School</u>	<u>General High School</u>	<u>College</u>	<u>Primary Training Institute</u>	<u>Junior Training Institute</u>	<u>Teacher Training College</u>	<u>Tech-nical Institute</u>	<u>Poly-technic Institute</u>	<u>Engineering College</u>
<u>Capital Costs per Student Place</u>									
Books	-	7	8	137	15	88	43	78	193
Equipment	-	39	60	39	39	281	243	444	4,807
Furniture	-	27	36	123	23	358	233	307	1,004
Others (mainly Construction)	<u>180</u>	<u>256</u>	<u>1,844</u>	<u>3,496</u>	<u>5,728</u>	<u>5,714</u>	<u>5,500</u>	<u>6,090</u>	<u>18,000</u>
Total	<u>180</u>	<u>329</u>	<u>1,948</u>	<u>3,795</u>	<u>5,805</u>	<u>6,441</u>	<u>6,019</u>	<u>6,919</u>	<u>24,004</u>
<u>Recurrent Costs per Student/Year</u>									
Personnel: Teachers	18.8	55.9	91.2	272.6	475.9	337.9	516.6	349.4	441.7
Others	-	4.0	18.2	55.2	53.7	188.3	405.4	120.5	307.2
Operation of Plant	-	3.2	-	0.1	-	0.2	5.4	39.6	246.8
Maintenance: Plant	-	0.3	-	0.2	-	-	6.9	1.4	210.5
Building	-	1.5	0.6	0.3	-	21.5	-	28.0	84.2
Books	-	0.8	0.6	2.3	1.3	-	69.5	4.8	47.4
Equipment	0.1	2.8	1.9	0.7	1.3	-	125.5	56.3	371.5
Miscellaneous	<u>0.1</u>	<u>7.3</u>	<u>39.4</u>	<u>604.8</u>	<u>255.6</u>	<u>111.8</u>	<u>520.2</u>	<u>398.1</u>	<u>908.4</u>
Total	<u>19.0</u>	<u>75.8</u>	<u>151.9</u>	<u>936.2</u>	<u>787.8</u>	<u>659.7</u>	<u>1,649.5</u>	<u>998.1</u>	<u>2,617.7</u>

Source: GOP, Planning Department, Manpower Planning in East Pakistan, 1969.

BANGLADESH

EDUCATION PROJECT: IDA CR-49

Table 5 - IDA DISBURSEMENTS BY CATEGORY  
(US\$ 000 's)

	<u>Agricultural University (Mymensingh)</u>						<u>Technical Institutes<sup>d/</sup></u>	<u>Technical Teacher Training (Dacca)</u>	<u>TOTAL</u>
	<u>Construction</u>			<u>Instructional Equipment</u>	<u>Consultant Services<sup>c/</sup></u>	<u>Total</u>	<u>Instructional Equipment</u>	<u>Technical Services and Overseas Training</u>	
	<u>Materials and Equipment</u>	<u>Local Expenditures</u>	<u>Total Construction</u>						
1964	-	-	-	-	-	-	-	24.0	24.0
1965	33.4	135.4	168.8	122.1	22.1	313.0	92.9	192.2	598.1
1966	55.3	125.0	180.3	497.8	-	678.1	308.5	43.4	1,030.0
1967	242.7	122.9	365.6	66.3	40.1	472.0	462.4	58.4	992.8
1968	40.8	146.0	186.8	40.1	52.6	279.5	116.1	11.9	407.5
1969	82.1	149.6	231.7	98.7	12.4	342.8	16.1	-	358.9
1970	28.2	92.9	121.1	12.3	6.6	140.0	44.6	-	184.6
1971	-	-	-	9.9	1.1	11.0	87.3	-	98.3
Total Disbursed <sup>a/</sup>	<u>482.5</u>	<u>771.8</u>	<u>1,254.3</u>	<u>847.2</u>	<u>134.9</u>	<u>2,236.4</u>	<u>1,127.9</u>	<u>329.9</u>	<u>3,694.2</u>
Total Allocated	950.0	800.0	1,750.0	900.0	150.0	2,800.0	1,200.0	500.0 <sup>e/</sup>	4,500.0
Total Cancelled	467.5 <sup>b/</sup>	28.2	495.7	52.8	15.1	563.6	72.1	170.1 <sup>f/</sup>	805.8

<sup>a/</sup> Disbursements were suspended as of December 29, 1971, due to civil strife.

<sup>b/</sup> Including cost of unbuilt convocation hall estimated at US\$ 226,000.

<sup>c/</sup> The List of Goods allocated to construction materials and equipment was revised on September 27, 1965, to pay US\$ 150,000 for consultant services in the preparation of a Master Plan.

<sup>d/</sup> At Comilla, Faridpur, Mymensingh, Rajshahi, Dinajpur, Feni, Jessore, Kushtia.

<sup>e/</sup> The List of Goods allocated to expatriate technical teacher training specialists and counterpart training abroad was revised on March 11, 1970, to pay US\$ 171,000 towards the purchase of equipment for the Dacca Polytechnic Institute. This amount was still not procured when the undisbursed portion of Credit 49-PAK was cancelled on September 29, 1972, but the balance was merged into Credit 407-BD of June 29, 1973.

<sup>f/</sup> Excludes final allocation of US\$ 882, which was over-disbursed for the technical training program.

BANGLADESH

EDUCATION PROJECT: IDA CR-49

Table 6 - ACTUAL VS. ESTIMATED PROJECT COSTS BY CATEGORY<sup>a/</sup>  
(US\$ 000's)

	<u>Construction</u>		<u>Equipment</u>		<u>Personnel Costs</u>		<u>Total Project Cost</u>	
	<u>Estimated</u>	<u>Actual</u>	<u>Estimated</u>	<u>Actual</u>	<u>Estimated</u>	<u>Actual</u>	<u>Estimated</u>	<u>Actual</u>
Agricultural University:								
Subtotal	5,250.0	5,458.7 <sup>b/</sup>	903.0	847.2		134.9 <sup>c/</sup>	6,153.0	6,440.8
Technical Institutes:								
Group I	535.5	1,518.5	567.0				1,102.5	
Group II	850.5	1,455.5	567.0				1,417.5	
Subtotal	1,386.0	2,974.0	1,134.0	1,127.9			2,520.0	4,101.9
Technical Teacher Training								
Foreign Teachers					441.0	234.6	441.0	234.6
Overseas Training					63.0	49.3	63.0	49.3
Administration Costs						45.1 <sup>d/</sup>		45.1
Subtotal					504.0	329.9 <sup>e/</sup>	504.0	329.9
<b>Total</b>	<u>6,636.0</u>	<u>8,432.7</u>	<u>2,037.0</u>	<u>1,975.1</u>	<u>504.0</u>	<u>464.8</u>	<u>9,177.0</u>	<u>10,872.6</u>

Table 7 - ACTUAL VS. ESTIMATED PROJECT FINANCING BY TYPE OF CURRENCY  
(US\$ 000's)

	<u>Expenditures in Foreign Exchange</u>		<u>Expenditures in Local Currency</u>		<u>Total Credit</u>	
	<u>Estimated</u>	<u>Actual</u>	<u>Estimated</u>	<u>Actual</u>	<u>Estimated</u>	<u>Actual</u>
Agricultural University:						
Construction	1,100	483	800	772	1,900	1,255
Instructional Equipment	720	847	180	-	900	847
Consultant Services	<sup>a/</sup> 135	135	-	-	-	135
Subtotal	<u>1,820</u>	<u>1,465</u>	<u>980</u>	<u>772</u>	<u>2,800</u>	<u>2,237</u>
Technical Institutes						
Instructional Equipment	960	1,128	240	-	1,200	1,128
Technical Teacher Training						
Consultant Services	) 300	123	) 200	112	) 500	235
Overseas Training	) 35	35	) 14	14	) 49	49
Administrative Cost		34		11		45
Instructional Equipment <sup>f/</sup>		-		-		-
Subtotal	<u>300</u>	<u>192</u>	<u>200</u>	<u>137</u>	<u>500</u>	<u>329</u>
<b>Total</b>	<u>3,080</u>	<u>2,785</u>	<u>1,420</u>	<u>909</u>	<u>4,500</u>	<u>3,694</u>

<sup>a/</sup> Costs of eligible project items only as estimated at appraisal (Report TO-397a, of March 10, 1964 -- 1 US\$ = 4.762 Rupees) according to subsequent changes in the List of Goods.

<sup>b/</sup> Excludes costs of the unbuilt convocation hall estimated at US\$226,000.

<sup>c/</sup> The List of Goods allocated for construction materials and equipment was revised on September 27, 1965, in the amount of US\$150,000 to pay the foreign exchange costs of consultant services for the preparation of a Master Plan.

<sup>d/</sup> Administration cost paid to Oklahoma State University, amounting to 15% of total expenditures for technical assistance and training.

<sup>e/</sup> Final allocation of US\$ 882 was over-disbursed for the technical teacher training program.

<sup>f/</sup> Revision on the List of Goods in the amount of US\$171,000 on March 11, 1970, to finance equipment purchases for the Dacca Polytechnic Institute.

BANGLADESH

EDUCATION PROJECT: IDA CR-49

Table 8. SELECTED INDICATORS ON THE EXPANSION  
OF THE AGRICULTURAL UNIVERSITY

	<u>1962</u>	<u>1968</u>	<u>1971</u>
Faculty No. Total	52	151	240
Faculty No. with Degrees earned abroad	15	74	128
Degrees earned in Pakistan	37	77	112
Faculty No. Trained in Agricultural Extension	0	3	9
Faculty having: Ph.D.	6	35	79
M.S.	20	89	108
B.S.	26	27	53
Total No. of Students:			
1st year	139	450	816
2nd year	134	294	280
3rd year	109	150	233
4th year	47	140	157
5th year	15	100	125
6th year	0	16	35
M.Sc. Prel.	0	30	32
M.Sc. Final	<u>0</u>	<u>120</u>	<u>98</u>
	444	1300	1776
Graduating with:			
B.S.	15	111	193
M.S.	0	87	51
Ph.D.	<u>0</u>	<u>0</u>	<u>0</u>
	15	198	244
Hostel space, No. of students	425	1300	1700

BANGLADESH

EDUCATION PROJECT: IDA CR-49

Table 9: PROJECT INSTITUTIONS - ACTUAL VS. PROJECTED<sup>a/</sup> ENROLLMENTS AND OUTPUT

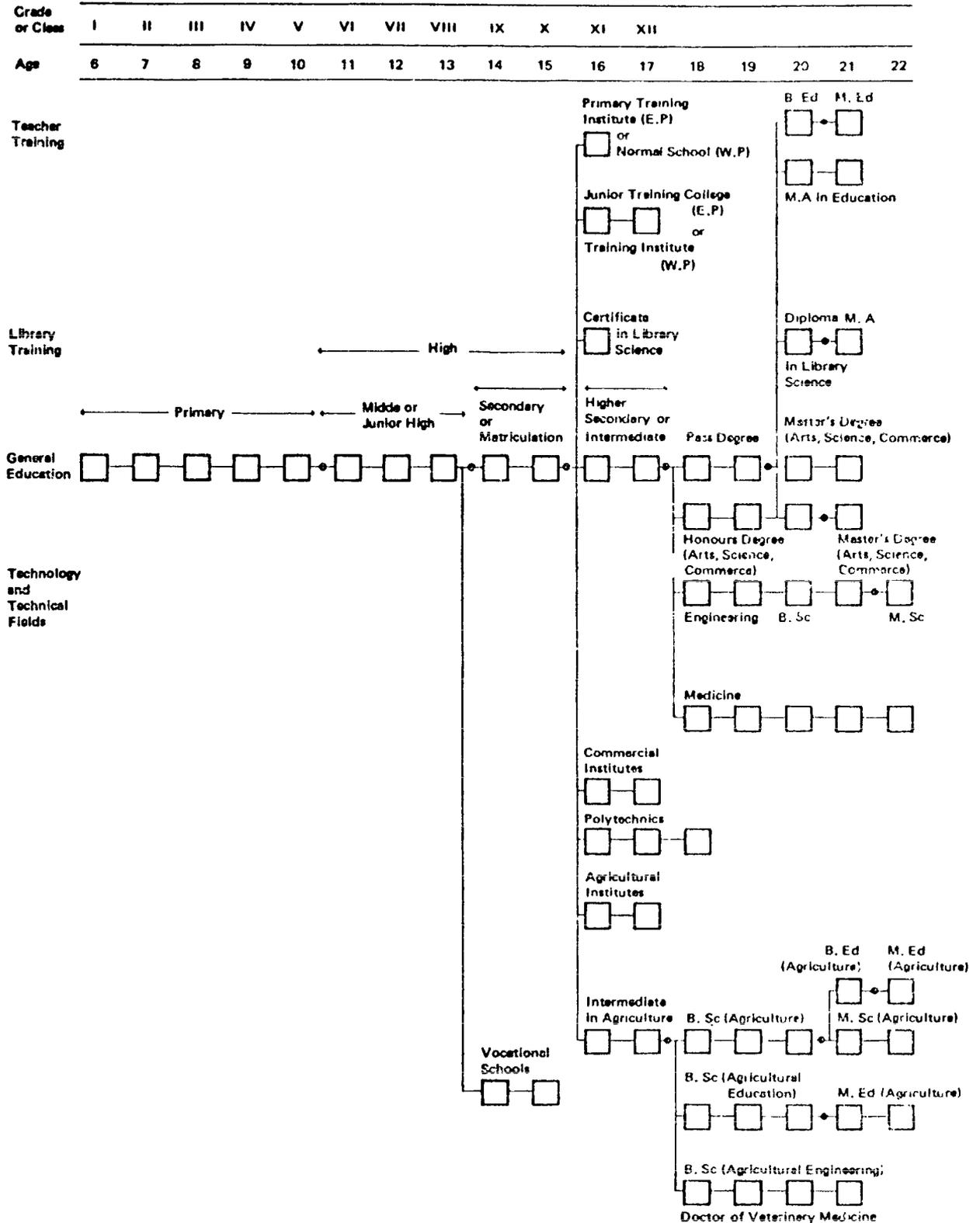
			<u>1962/63</u>	<u>1963/64</u>	<u>1964/65</u>	<u>1965/66</u>	<u>1966/67</u>	<u>1967/68</u>	<u>1968/69</u>	<u>1969/70</u>	<u>1970/71</u>	
Agricultural University	( Enrollment	Projected			966					2403		
		Actual	538	717	794	1117	1151	1300	1210	1490	1776	
	( Output	Projected			95						340	
		Actual	15	73	86	138	141	176	198	244	192	
Technical Institutes	( Enrollment	Projected				1858				5000		
		Actual		298	876	1050	1473	1603	2289	3137	3289	
	( Output	Projected				320				550		
		Actual				108	172	416	272	365	762	
Technical Teacher College	( Output	Projected	90	100	110	125	130	140	150	150	150	
		Actual		22	20	43	50	73	-	25	-	

---

<sup>a/</sup> According to Appraisal Report estimates.

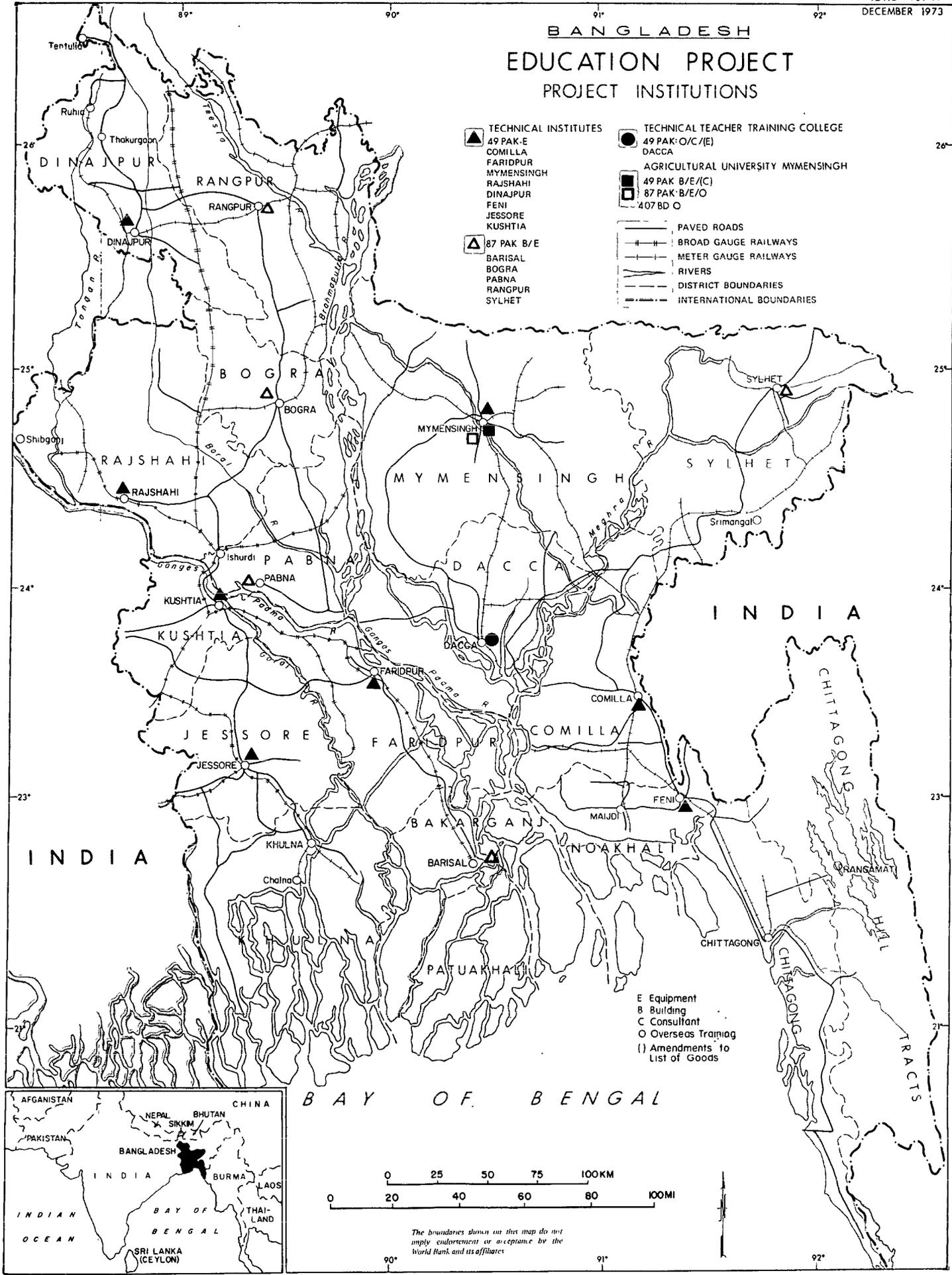
BANGLADESH

STRUCTURE OF EDUCATIONAL SYSTEM





# BANGLADESH EDUCATION PROJECT PROJECT INSTITUTIONS



The boundaries shown on this map do not imply endorsement or acceptance by the World Bank and its affiliates