

**CHAPTER VII**

**AID FOR INCREASED FOOD PRODUCTION IN 1986 AND BEYOND**



## CHAPTER VII

### AID FOR INCREASED FOOD PRODUCTION IN 1986 AND BEYOND

The Government of Bangladesh, based on the evaluations of the First and Second Five Year Plan, is planning to increase annual grains production by 5.2% in the Third Five Year Plan. Towards this end, the Government has created a plan to further introduce high-yield crops and chemical fertilizers and at the same time expand irrigation and flood control facilities. In addition, it is also planned under the Third Five Year Plan to increase production of such crops as potatoes, beans, vegetables, etc. in order to diversify the production of food supplies and nutrition sources.

While the execution of the Program beyond 1986 should be carried out in accordance with the principles established under the Third Five Year Plan, it is also necessary to take into consideration the current procedure and mechanism for the Program implementation, as well as items subject to import restrictions under the policies of the Government of Bangladesh regarding promotion and protection of domestic industries. Based on the above and items subject to restriction under registration and standardization policies, past achievements, and results of the subject study, it is anticipated that the following items will be requested under the Program beyond the fiscal year 1986.

- Fertilizers
  - Ammonium sulphate
  - Potassium sulphate
- Agro-chemicals
  - Silo fumigant
  - Insecticide for field application
  - Insecticide and fungicide for propagation of certified seeds
- Floating Pump
  - Floating Pump Unit
  - Tugboat
  - Small pump-barge
  - Inspection boat

- Repair and maintenance boat
- Fuel supply boat
- Materials and machinery for irrigation work
  - Submersible deep tubewell pump (electric motor driven)
  - Shallow tubewell and low-lift pump (solar powered)
  - Large pump
- Machinery for irrigation construction
  - Machinery for repair works
  - Channel excavator
  - Machinery for embankment construction
  - Excavators
- Post-harvest machinery
  - Combine
  - Rubber-roll type husker
  - Rice mill
  - Small warehouse
  - Dryer
- Machinery for grains transport
  - Grain transport truck
  - Grain transport boat

Furthermore, the items set out below are considered as possible items for request by the Government of Bangladesh not only in 1986 but in subsequent years as well. Although the said items may not be requested prior to the completion of registration and standardization procedures, there is strong domestic demand for them and they are considered appropriate for inclusion in the Program.

- (1) Requiring registration
  - Agro-chemical: Coumatetralyl (Rodenticide)
  - Seed sterilizer (for certified seeds)
- (2) Items requiring standardization and registration
  - Agricultural machinery: Tractor
    - Engine (for DTW)
    - Power Sprayer
    - Portable power sprayer
    - Power thresher

Under items subject to provision under the Program, there are those for which the Japanese product is more costly than generally prevailing international prices, as well as those which are subject to high demand inside Bangladesh but are no longer manufactured in Japan. In the event that a general loosening of current procurement conditions under the Program were to occur, it could be anticipated that the Government of Bangladesh would request the following items:

- TSP fertilizer
- Zinc sulphate
- Aluminium phosphide

The Government of Bangladesh expressed its desire to expand the sectors subject to benefits under the Program to encompass food grains and vegetable production (including seed production), animal husbandry (particularly poultry) as well as fisheries. The Study Team concluded that, as the Program is in principle, currently directed at staple grain production, potatoes and beans could possibly be made a target of assistance. Vegetables, however, would require further study and evaluation. The Team also responded that livestock and fisheries at present could not be made an object of the Program. It would be reasonable to assume, nevertheless, that the Government of Bangladesh would continue in the future to request expansion of sectors eligible for the Program.

The following items are considered effective for the cultivation of potatoes and beans and their improved seeds production:

- Aquatic weed (water hyacinth, etc) collector  
(the weed collected would be used as compost)
- Compost machine
- Manure spreader
- Drip-irrigation facilities
- Sprinkler irrigation facilities
- Seed silo
- Bean thresher
- Insecticide/fungicide for upland crops

At the same time, the following equipment and materials which indirectly contribute to increased food production could be considered under a broad interpretation of the scope of the Program.

- Vehicles for agricultural extension.
- Audio-video equipment, mobile schools and training centers for farmer education.
- Equipment for pest-infestation prevention.
- Materials and equipment for agricultural research centers

**CHAPTER VIII**

**CONCLUSIONS AND RECOMMENDATIONS**





## CHAPTER VIII

### CONCLUSIONS AND RECOMMENDATIONS

#### 8.1 Conclusions

In the past, provision of agricultural commodities to Bangladesh under the Program was processed smoothly in general and was accepted as a substantial and effective mode of assistance by the Bangladesh side. In 1984, however, the Government of Bangladesh determined that procurement of Japanese made TSP fertilizer would be impossible under the 1984 Program due to the rising exchange rate of Japanese yen and movement in Bangladesh towards the reduction of fertilizer subsidies. Consequently, a portion of original Yen 3.35 billion package determined in the Exchange of Notes was left unused.

Regarding counterpart funds, although the Japanese Government requests deposit of counterpart funds of at least two-thirds the FOB price, the Ministry of Finance in Bangladesh has directed the receipt agencies to set up counterpart funds equivalent to 100% CIF price. For this reason, agencies receiving commodities under the Program have encountered difficulties in allocating budget for counterpart funds within the designated period.

At the same time, Bangladesh was strongly advised by the IBRD/IDA and other international funding agencies to abolish its agricultural input subsidy system in favor of output subsidies. In response, the Government is planning to abolish input subsidies commencing from July 1986. Accordingly, it is projected that rental or purchase of agricultural inputs by farmers will become very difficult, if not impossible. As a result, the Government of Bangladesh is faced with the need to formulate new policy regarding reception of materials and equipment under the Program and setting aside of counterpart funds.

To meet the demand for increasing food production under the Third Five Year Plan, the Government of Bangladesh has requested agro-chemicals, agricultural machinery, floating pumps and irrigation construction equipment from the Government of Japan under the 1985 Program and is expected to continue submitting such requests in the future. The results of the subject study indicated that with the

exception of certain items and quantities, the agro-chemicals, agricultural machinery, floating pumps and irrigation construction equipment requested in 1985 are appropriate for provision under the Program. The supply of floating pumps in particular would effectively serve to expand irrigated area in the dry season, directly contributing to increased food production. It is accordingly hoped that provision of such pumps will subsequently continue annually under the the Floating Pump Master Plan.

The Program should be continued to assist the Government of Bangladesh in achievement of self-sufficient food supply under the Third Five Year Plan. However, there are several points as summarized hereunder in the procedure and mechanism of the Program system in both countries which should be reviewed and improved in order to ensure smooth and effective implementation.

## 8.2 Recommendations

The following measures are recommended to improve future implementation of the Program.

- (1) The Government of Japan must review the appropriateness of the contents of the request, the distribution plan and operation and maintenance. However, due to delays in submission of the request on the part of the Government of Bangladesh, time has been insufficient to allow adequate review. In the future, the request should be submitted at least several months prior to commencement of each Program year which begins in April. It is desirable that the Government of Bangladesh undertake appropriate measures to ensure timely submission of requests.
- (2) In the past, items have been requested for nationwide distribution (fertilizer, agro-chemicals, pump engines for irrigation, etc.). Contribution of items to specific projects (eg. BADC's Floating Pump Project, BWDB's Kurigram Irrigation Project, etc.) should be considered hereafter. This would facilitate annual planning and post-evaluation of the effects of the Program.
- (3) Loosening of restrictions (eg. general untied status) on certain items for which the Japanese product is more costly than generally

prevailing international prices as well as items which are of high demand domestically but no longer manufactured in Japan, should be studied as a possible measure.

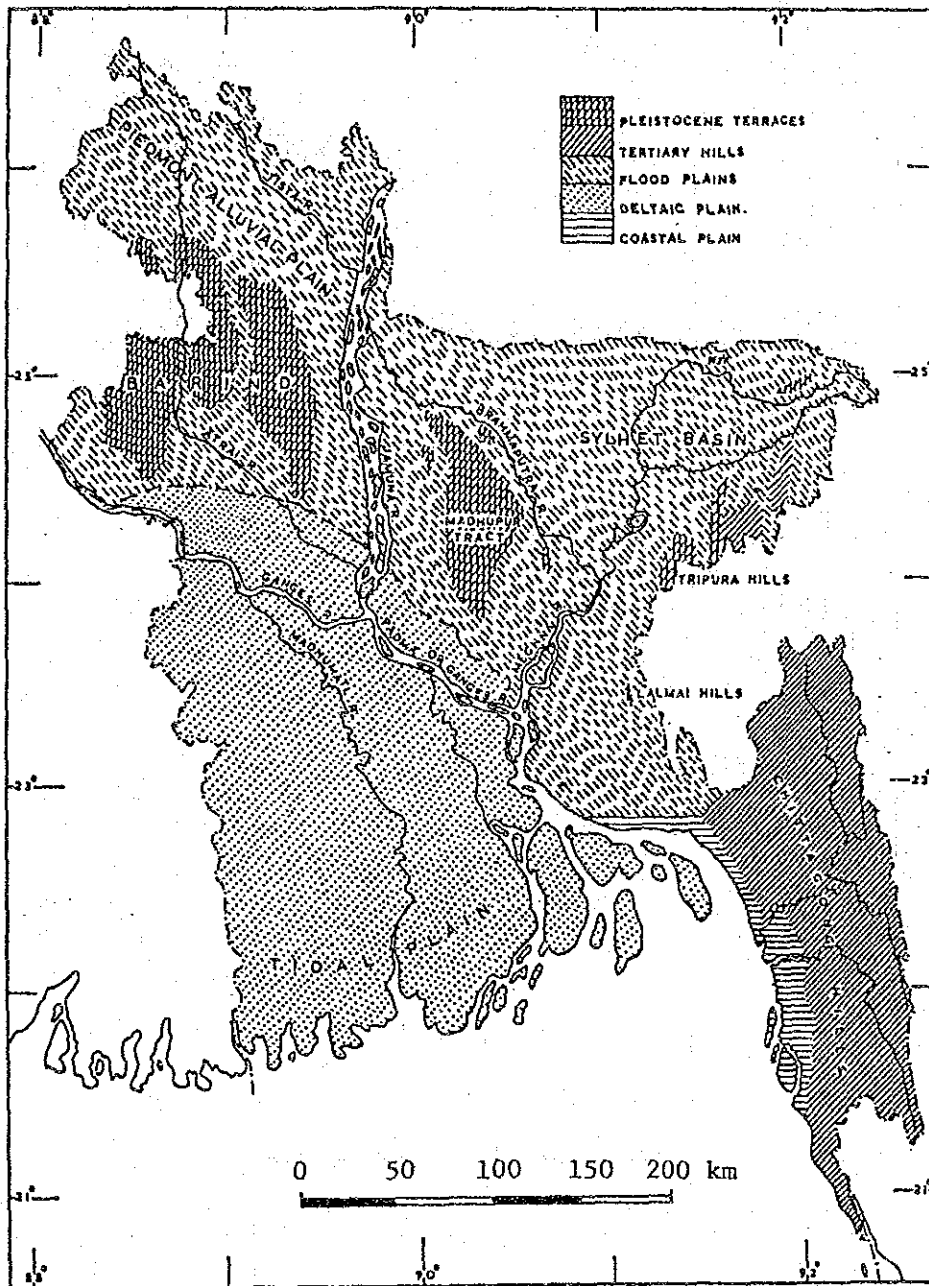
- (4) Counterpart funds are presently deposited by agencies within the Government of Bangladesh according to government procedures which call for 100% of the CIF price as opposed to the two-thirds of the FOB price stipulated in the Exchange of Notes. However, as this results in subsequent increase in counterpart funding required for certain items supplied at cost comparatively greater than prevailing international prices, various recipient agencies are faced with budgetary constraints when making requests. It is accordingly suggested that the Government of Bangladesh relax its counterpart funding procedures as well as take measures to ensure that counterpart funds deposited by a particular agency are specifically directed at and utilized on the projects of that agency.
- (5) Studies should be considered to restructure the Program when there are engineering and civil works involved in addition to provision of materials and machinery. Multiple effects of the Program can be obtained if engineering and construction works are proposed as objectives of the Program, to be implemented in parallel or successively under cooperation in terms of loans, general grants, or technical cooperation.
- (6) The possibility should be studied of extending the objectives of the Program to sectors other than food-crop cultivation, such as livestock production, fishery, forestry, farm-road construction, and indirectly contributing sectors such as agricultural extension and education of farmers.
- (7) In order to make the implementation of the the Program truly useful to Bangladesh, dispatch of a JICA expert or long-term resident specialist capable of long term study, evaluation and advice regarding the status of the Program to the recipient government would be considered effective. It is recommended that the feasibility of dispatching such an advisor be studied in the near future.



**TABLES AND FIGURES**



FIG. 2-1 TOPOGRAPHY



Source: Agriculture of Bangladesh, AICAP

TABLE 2-1 LAND USE

(Unit: 1,000 ha)

|         | Single<br>Cropping | Double<br>Cropping | Triple<br>Cropping | Arable<br>Land | Cropped<br>Area | Cropping<br>Intensity |
|---------|--------------------|--------------------|--------------------|----------------|-----------------|-----------------------|
| 1973/74 | 5,071              | 2,911              | 508                | 8,490          | 12,414          | 146.3                 |
| 1974/75 | 5,051              | 2,752              | 518                | 8,321          | 12,107          | 145.5                 |
| 1975/76 | 4,958              | 2,942              | 586                | 8,486          | 12,600          | 148.5                 |
| 1976/77 | 4,820              | 2,862              | 592                | 8,274          | 12,319          | 148.9                 |
| 1977/78 | 4,728              | 3,043              | 603                | 8,374          | 12,623          | 150.7                 |
| 1978/79 | 4,599              | 3,167              | 652                | 8,418          | 12,844          | 153.1                 |
| 1979/80 | 4,610              | 3,183              | 655                | 8,448          | 12,940          | 153.2                 |
| 1980/81 | 4,636              | 3,254              | 672                | 8,562          | 13,161          | 153.7                 |
| 1981/82 | 4,639              | 3,266              | 679                | 8,584          | 13,208          | 153.9                 |
| 1982/83 | 4,588              | 3,339              | 684                | 8,611          | 13,317          | 154.7                 |
| 1983/84 | 4,665              | 3,375              | 612                | 8,652          | 13,250          | 153.2                 |

Source: 1984-85 Yearbook of Agricultural Statistics of Bangladesh





TABLE 2-2 CULTIVATED AREA OF MAJOR CROPS

(Unit : million ha)

| Crops                 | Crop Year |         |         |         |         |         |         |         |
|-----------------------|-----------|---------|---------|---------|---------|---------|---------|---------|
|                       | 1977/78   | 1978/79 | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 |
| Rice                  | 10.04     | 10.12   | 10.17   | 10.31   | 10.46   | 10.59   | 10.55   | 10.23   |
| Aman                  | 5.78      | 5.81    | 5.98    | 6.04    | 6.01    | 6.00    | 6.01    | 5.71    |
| Aus                   | 3.16      | 3.24    | 3.04    | 3.11    | 3.15    | 3.16    | 3.14    | 2.94    |
| Boro                  | 1.10      | 1.07    | 1.15    | 1.16    | 1.30    | 1.43    | 1.40    | 1.58    |
| Wheat                 | 0.19      | 0.26    | 0.43    | 0.59    | 0.53    | 0.52    | 0.53    | 0.68    |
| Jute                  | 0.73      | 0.83    | 0.76    | 0.64    | 0.58    | 0.60    | 0.58    | 0.60    |
| Oilseeds              | 0.30      | 0.30    | 0.30    | 0.31    | 0.30    | 0.26    | 0.29    | ..      |
| Pulses                | 0.34      | 0.34    | 0.33    | 0.33    | 0.31    | 0.31    | 0.28    | ..      |
| Fruits and Vegetables | 0.25      | 0.26    | 0.26    | 0.28    | 0.28    | 0.28    | 0.29    | ..      |
| Sugarcane             | 0.15      | 0.15    | 0.15    | 0.15    | 0.16    | 0.17    | 0.17    | ..      |
| Spices                | 0.13      | 0.13    | 0.15    | 0.13    | 0.13    | 0.15    | 0.15    | ..      |
| Potato                | 0.09      | 0.10    | 0.10    | 0.10    | 0.11    | 0.17    | 0.18    | 0.11    |
| Tobacco               | 0.06      | 0.06    | 0.04    | 0.05    | 0.06    | 0.06    | 0.05    | ..      |
| Other Crops           | 0.35      | 0.35    | 0.31    | 0.20    | 0.24    | 0.21    | 0.19    | ..      |
| TOTAL                 | 12.63     | 12.90   | 13.00   | 13.09   | 13.16   | 13.32   | 13.26   | -       |
| Cropping Intensity    | 151       | 153     | 153     | 154     | 154     | 155     | 153     | -       |

Source : Statistical Yearbook of Bangladesh, 1983-84, Bangladesh Bureau of Statistics, Ministry of Planning.  
 Statistical Bulletin of Bangladesh, June 1985. Bangladesh Bureau of Statistics, Ministry of Planning.

TABLE 2-3 YIELD OF MAJOR CROPS

(Unit: mt/ha)

| Crops               | Crop Year |         |         |         |         |         |         |         |
|---------------------|-----------|---------|---------|---------|---------|---------|---------|---------|
|                     | 1977/78   | 1978/79 | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 |
| <u>Yield(mt/ha)</u> |           |         |         |         |         |         |         |         |
| Rice <u>a</u> /     | 1.29      | 1.27    | 1.25    | 1.35    | 1.30    | 1.32    | 1.35    | 1.42    |
| Aman                | 1.31      | 1.30    | 1.24    | 1.32    | 1.20    | 1.30    | 1.30    | 1.38    |
| Aus                 | 0.99      | 1.03    | 0.94    | 1.06    | 1.04    | 0.95    | 1.02    | 0.95    |
| Boro                | 2.08      | 1.82    | 2.15    | 2.27    | 2.42    | 2.45    | 2.36    | 2.41    |
| Wheat               | 1.84      | 1.86    | 1.90    | 1.85    | 1.81    | 2.11    | 2.26    | 2.21    |
| Jute                | 1.37      | 1.45    | 1.48    | 1.48    | 1.54    | 1.46    | 1.49    | 1.45    |
| Oilseeds            | 0.89      | 0.89    | 0.87    | 0.82    | 0.84    | 0.77    | 0.69    | ..      |
| Pulses              | 0.71      | 0.67    | 0.65    | 0.66    | 0.66    | 0.65    | 0.71    | ..      |
| Sugarcane           | 43.60     | 44.80   | 44.10   | 44.00   | 44.30   | 42.35   | 40.59   | ..      |
| Spices              | 1.94      | 1.96    | 1.91    | 1.94    | 1.94    | 1.94    | 2.00    | ..      |
| Potato              | 9.58      | 9.40    | 9.50    | 10.00   | 10.20   | 6.47    | 10.00   | 10.91   |
| Tobacco             | 0.87      | 0.87    | 0.87    | 0.92    | 0.93    | 0.83    | 1.00    | ..      |

.. = not available

a / White Rice.Source: Statistical Yearbook of Bangladesh, 1983-84, Bangladesh Bureau of Statistics,  
Ministry of Planning.Statistical Bulletin of Bangladesh, June 1985, Bangladesh Bureau of Statistics,  
Ministry of Planning.

TABLE 2-4 PRODUCTION OF MAJOR CROPS

(Unit: million mt)

| Crops             | Crop Year |         |         |         |         |         |         |         |
|-------------------|-----------|---------|---------|---------|---------|---------|---------|---------|
|                   | 1977/78   | 1978/79 | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 | 1984/85 |
| <u>Production</u> |           |         |         |         |         |         |         |         |
| Rice <u>a</u> /   | 13.0      | 12.8    | 12.7    | 13.9    | 13.6    | 14.0    | 14.3    | 14.5    |
| Aman              | 7.5       | 7.5     | 7.4     | 8.0     | 7.2     | 7.5     | 7.8     | 7.9     |
| Aus               | 3.2       | 3.3     | 2.9     | 3.3     | 3.3     | 3.0     | 3.2     | 2.8     |
| Boro              | 2.3       | 2.0     | 2.5     | 2.6     | 3.1     | 3.5     | 3.3     | 3.8     |
| Wheat             | 0.3       | 0.5     | 0.8     | 1.1     | 1.0     | 1.1     | 1.2     | 1.5     |
| Jute              | 1.0       | 1.2     | 1.1     | 0.9     | 0.9     | 0.9     | 0.9     | 0.9     |
| Oilseeds          | 0.3       | 0.3     | 0.2     | 0.2     | 0.2     | 0.2     | 0.2     | ..      |
| Pulses            | 0.2       | 0.2     | 0.2     | 0.2     | 0.2     | 0.2     | 0.2     | ..      |
| Sugarcane         | 6.6       | 6.9     | 6.7     | 6.6     | 7.1     | 7.2     | 6.9     | ..      |
| Spices            | 0.3       | 0.3     | 0.3     | 0.3     | 0.3     | 0.3     | 0.3     | ..      |
| Potato            | 0.9       | 0.9     | 0.9     | 1.0     | 1.1     | 1.1     | 1.8     | 1.2     |
| Tobacco           | 0.05      | 0.04    | 0.04    | 0.05    | 0.05    | 0.05    | 0.05    | ..      |

.. = not available

a / White Rice.Source: Statistical Yearbook of Bangladesh, 1983-84, Bangladesh Bureau of Statistics,  
Ministry of Planning.Statistical Bulletin of Bangladesh, June 1985, Bangladesh Bureau of Statistics,  
Ministry of Planning.

TABLE 2-5 LAND POSSESSION  
BY CULTIVATION SCALES<sup>1)</sup>

| Area in aereo | Nos. of Farming Families. (×10,000) | Percentage of Farming Families (%) | Percentage of Farming Families with own land (%) | Population (×10,000) | Percentage of Farming Families (%) | Farm land in possession (×10,000ares) | Percentage of Farming Families (%) |
|---------------|-------------------------------------|------------------------------------|--|----------------------|------------------------------------|---------------------------------------|------------------------------------|
| 0             | 388.6                               | 32.8                               |  | 1,870.3              | 27.1                               | —                                     | —                                  |
| 0.01 ~ 1.00   | 344.8                               | 29.1                               | 43.3   | 1,849.9              | 26.8                               | 175.0                                 | 9.6                                |
| 1.01 ~ 2.00   | 186.9                               | 15.8                               | 23.5   | 1,133.5              | 16.4                               | 282.4                                 | 15.5                               |
| 2.01 ~ 3.00   | 90.7                                | 7.6                                | 11.4   | 602.7                | 8.7                                | 228.8                                 | 12.6                               |
| 3.01 ~ 4.00   | 59.3                                | 5.0                                | 7.4  | 433.6                | 6.3                                | 210.0                                 | 11.6                               |
| 4.01 ~ 5.00   | 35.3                                | 3.0                                | 4.4  | 271.5                | 3.9                                | 163.2                                 | 9.0                                |
| 5.01 ~ 6.00   | 19.8                                | 1.7                                | 2.5  | 165.0                | 2.4                                | 110.0                                 | 6.1                                |
| 6.01 ~ 7.00   | 15.5                                | 1.3                                | 2.0  | 134.0                | 2.0                                | 102.1                                 | 5.6                                |
| 7.01 ~ 8.00   | 10.7                                | 0.9                                | 1.3  | 96.2                 | 1.4                                | 80.8                                  | 4.4                                |
| 8.01 ~ 9.00   | 7.0                                 | 0.6                                | 0.9  | 64.9                 | 0.9                                | 60.0                                  | 3.3                                |
| 9.01 ~ 10.00  | 5.6                                 | 0.5                                | 0.6  | 51.0                 | 0.7                                | 54.3                                  | 3.0                                |
| 10.01 ~ 11.00 | 2.5                                 | 0.2                                | 0.3  | 22.0                 | 0.3                                | 26.1                                  | 1.4                                |
| 11.01 ~ 12.00 | 3.7                                 | 0.3                                | 0.5  | 39.3                 | 0.6                                | 43.3                                  | 2.4                                |
| 12.01 ~ 13.00 | 1.6                                 | 0.1                                | 0.2  | 15.0                 | 0.2                                | 20.5                                  | 1.1                                |
| 13.01 ~ 14.00 | 2.0                                 | 0.2                                | 0.3  | 23.4                 | 0.4                                | 26.3                                  | 1.5                                |
| 14.01 ~ 15.00 | 1.9                                 | 0.1                                | 0.3  | 21.1                 | 0.3                                | 27.4                                  | 1.5                                |
| 15.00 以上      | 9.0                                 | 0.8                                | 1.1  | 109.1                | 1.6                                | 207.3                                 | 11.4                               |
| TOTAL         | 1,184.9<br>(796.3) <sup>2)</sup>    | 100.0                              | (100.0)  | 6,902.5              | 100.0                              | 1,817.5                               | 100.0                              |

(Source) B. B. S : Summary Report of the 1977 Land Occupancy Survey of Rural Bangladesh, Dacca, 1977, PP.13, Table II.

Note : 1) Exclusive of residential area.

2) Figure in the parenthesis is the number of Farming Families having their own farm land.

TABLE 2 - 6 DISBURSEMENT OF FOREIGN  
ECONOMIC ASSISTANCE  
( Million U. S. Dollar )

|         | Food Aid |       | Non-Project Aid <sup>a/</sup> |       | Project Aid <sup>b/</sup> |       | Sub Total |       | TOTAL   |
|---------|----------|-------|-------------------------------|-------|---------------------------|-------|-----------|-------|---------|
|         | Grants   | Loans | Grants                        | Loans | Grants                    | Loans | Grants    | Loans |         |
| 1976/77 | 77.1     | 44.5  | 125.5                         | 129.1 | 52.9                      | 105.6 | 255.5     | 279.2 | 534.7   |
| 1977/78 | 116.8    | 61.0  | 154.5                         | 225.9 | 121.5                     | 154.1 | 392.8     | 441.0 | 833.8   |
| 1978/79 | 162.1    | 16.9  | 204.5                         | 278.1 | 135.3                     | 233.1 | 501.9     | 528.1 | 1,030.0 |
| 1979/80 | 318.8    | 55.9  | 161.6                         | 216.9 | 170.2                     | 299.7 | 650.6     | 575.5 | 1,223.1 |
| 1980/81 | 162.6    | 31.5  | 179.6                         | 212.9 | 251.5                     | 308.4 | 593.7     | 552.8 | 1,146.5 |
| 1981/82 | 230.5    | -     | 212.9                         | 206.9 | 210.4                     | 378.9 | 653.8     | 585.8 | 1,239.6 |
| 1982/83 | 221.1    | 34.4  | 244.5                         | 207.5 | 121.9                     | 348.0 | 587.5     | 589.9 | 1,177.4 |
| 1983/84 | 263.0    | 13.4  | 244.4                         | 194.8 | 226.4                     | 326.4 | 733.8     | 534.6 | 1,268.4 |
| 1984/85 | 262.5    | 2.5   | 189.2                         | 235.8 | 250.5                     | 399.5 | 702.2     | 637.8 | 1,340.0 |

a/ Includes cash aid

b/ Includes technical assistance

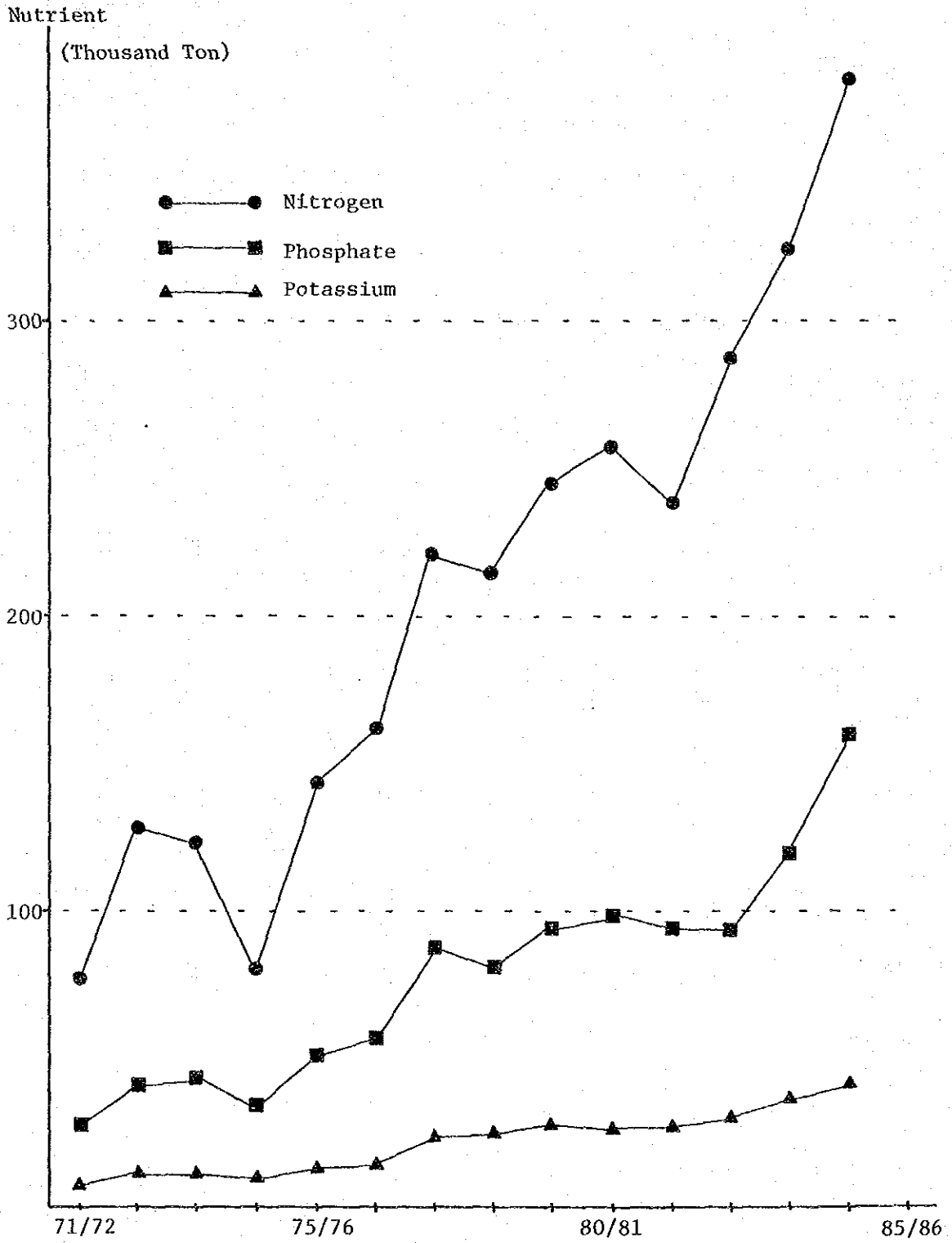
Source: External Resources Division, Ministry of Finance

TABLE 2-7 DISBURSEMENT OF FOREIGN AID  
ASSISTANCE BANGLADESH  
( Million U.S. Dollar )

| Country/ Agency   | Disbursement |         |         |         |         |         |         |         |
|-------------------|--------------|---------|---------|---------|---------|---------|---------|---------|
|                   | 1976/77      | 1977/78 | 1978/79 | 1979/80 | 1980/81 | 1981/82 | 1982/83 | 1983/84 |
| Australia         | 7            | 13      | 16      | 27      | 21      | 23      | 13      | 13      |
| A. D. B.          | 6            | 16      | 50      | 43      | 46      | 38      | 49      | 46      |
| Belgium           | 4            | 5       | 2       | -       | -       | 8       | 6       | 3       |
| Canada            | 42           | 71      | 76      | 60      | 70      | 68      | 91      | 137     |
| China             | -            | -       | -       | -       | 7       | 11      | -       | 19      |
| Denmark           | 1            | 3       | 8       | 11      | 3       | 14      | 21      | 17      |
| E. E. C.          | 15           | 17      | 21      | 24      | 23      | 38      | 51      | 39      |
| F. R. G.          | 26           | 58      | 37      | 136     | 72      | 51      | 43      | 61      |
| France            | 9            | 9       | 5       | 5       | 21      | 47      | 14      | 17      |
| Ford Foundation   | 1            | 1       | 1       | 2       | 1       | 1       | -       | -       |
| I. D. A.          | 87           | 86      | 152     | 152     | 178     | 107     | 209     | 265     |
| India             | 9            | 6       | 9       | 2       | 12      | 9       | 27      | 3       |
| Iraq              | -            | -       | 10      | 1       | 1       | -       | 6       | -       |
| I. F. A. D.       | -            | -       | -       | -       | 2       | 1       | -       | 8       |
| I. D. B.          | -            | -       | 3       | 9       | 1       | -       | 16      | -       |
| Japan             | 39           | 113     | 131     | 166     | 162     | 194     | 164     | 94      |
| Kuwait            | 6            | 8       | 9       | 15      | 16      | 8       | 19      | 1       |
| Netherlands       | 2            | 12      | 32      | 29      | 51      | 66      | 48      | 46      |
| Norway            | 5            | 29      | 7       | 24      | 24      | 24      | 30      | 5       |
| O. P. E. C.       | 7            | 7       | 5       | 3       | 3       | 29      | 24      | 18      |
| Saudi Arabia      | 54           | 29      | 34      | 90      | 6       | 16      | 41      | 71      |
| Sweden            | 25           | 18      | 29      | 21      | 27      | 16      | 38      | 17      |
| Supplier's credit | -            | -       | -       | -       | 5       | 26      | 42      | 9       |
| U. K.             | 31           | 41      | 74      | 65      | 51      | 40      | 42      | 44      |
| U. S. A.          | 58           | 131     | 170     | 177     | 134     | 117     | 187     | 161     |
| U. N. System      | 27           | 43      | 52      | 54      | 38      | 83      | 30      | 17      |
| UNICEF            | 4            | 14      | 9       | 14      | 15      | 5       | 10      | 3       |
| U. S. S. R.       | 5            | 22      | 6       | 8       | 4       | 2       | 9       | 51      |
| U. A. E.          | 4            | 3       | 2       | 2       | 8       | 1       | 3       | -       |
| Yugoslavia        | 9            | 6       | 10      | 10      | 5       | 6       | 4       | -       |
| Other Countries   | 51           | 67      | 69      | 145     | 141     | 187     | 108     | 102     |
| Grand Total :     | 534          | 828     | 1,029   | 1,295   | 1,148   | 1,236   | 1,345   | 1,267   |

Source : BBS

FIG. 3-1 PAST TREND OF FERTILIZER NUTRIENT CONSUMPTION



Source: BADC



TABLE 3-1 YIELD AND INPUT USE ON AUS PADDY  
1981 IN SAMPLE AREA

|                                      |              | Aus 1981    |             |             |
|--------------------------------------|--------------|-------------|-------------|-------------|
|                                      |              | LV          | HYV         | All paddy   |
| Crop production average yield        | kg/ha        | 1,199       | 2,329       | 1,452       |
| Use of chemical fertilizer           |              |             |             |             |
| Average level of application area    |              |             |             |             |
| Urea                                 | kg/ha (%)    | 71.9(46)    | 124.5(95)   | 92.2(57)    |
| TSP                                  | "            | 79.3(16)    | 101.5(73)   | 91.3(29)    |
| MP                                   | "            | 43.3( 3)    | 51.6(44)    | 50.7(12)    |
| DAP                                  | "            | 36.0( 2)    | 261.9( 3)   | 135.6( 2)   |
| Average level of all area            |              |             |             |             |
| Urea                                 | kg/ha        | 33.2        | 118.1       | 52.6        |
| TSP                                  | "            | 12.9        | 73.8        | 26.7        |
| MP                                   | "            | 0.9         | 23.1        | 6.5         |
| DAP                                  | "            | 1.8         | 7.4         | 2.8         |
| Total                                | "            | 48.8        | 222.4       | 88.6        |
| Use of organic manure                |              |             |             |             |
| Average level of application in area |              |             |             |             |
| Farmyard manure                      | kg/ha (%)    | 5,349.4(60) | 5,644.5(52) | 5,404.7(58) |
| Compost                              | "            | 3,375.6( 9) | 2,490.2(10) | 3,163.5( 9) |
| Average level of all area            |              |             |             |             |
| Farmyard manure                      | kg/ha        | 3,209.6     | 2914.5      | 3,135.8     |
| Compost                              | "            | 304.4       | 249.0       | 285.9       |
| Ashes                                |              |             |             |             |
| Average level of application area    | kg/ha (%)    | 1,761.6(14) | 1,780.0(22) | 1,761.6(16) |
| " of all area                        | kg/ha        | 249.0       | 387.4       | 285.9       |
| Use of pesticide                     |              |             |             |             |
| Average level of application area    | kg/ha (%)    | 1.0( 3)     | 2.4(33)     | 2.0( 9)     |
| " of all area                        | kg/ha        | 0.0         | 0.8         | 0.2         |
| Use of labor                         |              |             |             |             |
| Land preparation                     | Workdays/ha  | 34.77       | 37.14       | 35.31       |
| Planting-transplanting               | "            | 5.46        | 36.52       | 12.38       |
| Fertilizer basal application         | "            | 0.25        | 1.33        | 0.49        |
| Fertilizer topdressing               | "            | 0.52        | 1.68        | 0.79        |
| Organic fertilizer application       | "            | 6.25        | 6.10        | 6.23        |
| Pesticide application                | "            | 0.02        | 0.84        | 0.20        |
| Weeding                              | "            | 5.46        | 36.52       | 12.38       |
| Irrigation                           | "            | 0.10        | 9.51        | 2.20        |
| Harvesting                           | "            | 32.72       | 45.69       | 35.63       |
| Threshing                            | "            | 12.53       | 17.34       | 13.62       |
| Winnowing                            | "            | 6.86        | 8.25        | 7.17        |
| Total labor use                      | "            | 104.94      | 200.92      | 126.40      |
| Use of animal power                  |              |             |             |             |
| Land preparation                     | pair · hr/ha | 279         | 297         | 281         |
| Threshing                            | "            | 62          | 72          | 64          |
| Total use of animal power            | "            | 341         | 369         | 345         |
| Use of mechanical equipment          |              |             |             |             |
| Land preparation                     | hr/ha        | 0           | 0           | 0           |
| Irrigation                           | "            | 0.1         | 6.9         | 1.5         |
| Threshing                            | "            | 8.4         | 9.4         | 8.6         |
| Total use of mechanical equipment    | "            | 8.5         | 16.3        | 10.1        |

( ) Percent of the land treated with fertilizer out of the total land.

Source: Agricultural Production, Fertilizer Use, and Equity Consideration IFDC, Feb, 1984.

TABLE 3-2 YIELD AND INPUT USE ON AMAN PADDY 1981  
IN SAMPLE AREA

|                                      |              | Aman 1981   |            |             |
|--------------------------------------|--------------|-------------|------------|-------------|
|                                      |              | LV          | HYV        | All paddy   |
| Crop production average yield        | kg/ha        | 1,561       | 2,546      | 1,837       |
| Use of chemical fertilizer           |              |             |            |             |
| Average level of application area    |              |             |            |             |
| Urea                                 | kg/ha (%)    | 65.5(48)    | 115.3(83)  | 83.9(59)    |
| TSP                                  | "            | 69.2(17)    | 99.6(57)   | 85.8(29)    |
| MP                                   | "            | 35.0(7)     | 50.7(43)   | 46.1(17)    |
| DAP                                  | "            | 67.3(5)     | 113.4(4)   | 78.4(5)     |
| Average level of all area            |              |             |            |             |
| Urea                                 | kg/ha        | 31.4        | 95.9       | 48.9        |
| TSP                                  | "            | 12.0        | 57.2       | 24.9        |
| MP                                   | "            | 2.8         | 22.1       | 8.3         |
| DAP                                  | "            | 3.7         | 4.6        | 3.7         |
| Total                                | "            | 49.9        | 179.8      | 85.8        |
| Use of organic manure                |              |             |            |             |
| Average level of application in area |              |             |            |             |
| Farmyard manure                      | kg/ha (%)    | 2,517.9(20) | 3,006.7(8) | 2,582.4(17) |
| Compost                              | "            | 1,448.0(4)  | 1,466.5(6) | 1,448.0(5)  |
| Average level of all area            |              |             |            |             |
| Farmyard manure                      | kg/ha        | 507.3       | 239.8      | 439.0       |
| Compost                              | "            | 55.3        | 92.2       | 73.8        |
| Ashes                                |              |             |            |             |
| Average level of application area    | kg/ha (%)    | 1,300.4(1)  | 1,318.9(2) | 1,300.4(1)  |
| " of all area                        | kg/ha        | 12.9        | 27.7       | 9.2         |
| Use of pesticide                     |              |             |            |             |
| Average level of application area    | kg/ha (%)    | 1.1(2)      | 1.0(30)    | 0.98(10)    |
| " of all area                        | kg/ha        | 0.02        | 0.3        | 0.1         |
| Use of labor                         |              |             |            |             |
| Land preparation                     | Workdays/ha  | 30.57       | 31.60      | 30.84       |
| Planting-transplanting               | "            | 24.22       | 37.34      | 27.90       |
| Fertilizer basal application         | "            | 0.27        | 1.14       | 0.52        |
| Fertilizer topdressing               | "            | 0.57        | 1.16       | 0.74        |
| Organic fertilizer application       | "            | 1.46        | 0.89       | 1.31        |
| Pesticide application                | "            | 0.05        | 0.64       | 0.22        |
| Weeding                              | "            | 24.22       | 37.34      | 27.90       |
| Irrigation                           | "            | 0.59        | 4.13       | 1.58        |
| Harvesting                           | "            | 30.66       | 34.74      | 31.78       |
| Threshing                            | "            | 14.28       | 17.79      | 15.27       |
| Winnowing                            | "            | 6.80        | 8.67       | 7.31        |
| Total labor use                      | "            | 133.69      | 175.44     | 145.37      |
| Use of animal power                  |              |             |            |             |
| Land preparation                     | pair · hr/ha | 245         | 252        | 247         |
| Threshing                            | "            | 57          | 59         | 57          |
| Total use of animal power            | "            | 302         | 311        | 204         |
| Use of mechanical equipment          |              |             |            |             |
| Land preparation                     | hr/ha        | 0           | 0          | 0           |
| Irrigation                           | "            | 0.5         | 3.7        | 1.2         |
| Threshing                            | "            | 20.5        | 3.7        | 15.8        |
| Total use of mechanical equipment    | "            | 21.0        | 7.4        | 17.0        |

( ) Percent of the land treated with fertilizer out of the total land.

Source: Agricultural Production, Fertilizer Use, and Equity Consideration IPDC, Feb, 1984.

TABLE 3-3 YIELD AND INPUT ON BORO PADDY  
1981/82 IN SAMPLE AREA

|                                      |              | Boro 1981/82 |               |               |
|--------------------------------------|--------------|--------------|---------------|---------------|
|                                      |              | LV           | HYV           | All paddy     |
| Crop production average yield        | kg/ha        | 2,020        | 3,829         | 3,265         |
| Use of chemical fertilizer           |              |              |               |               |
| Average level of application area    |              |              |               |               |
| Urea                                 | kg/ha (%)    | 166.0 (15)   | 187.2 (94)    | 185.4 (70)    |
| TSP                                  | "            | 93.2 (9)     | 121.7 (87)    | 119.9 (62)    |
| MP                                   | "            | 57.2 (7)     | 48.9 (58)     | 48.9 (42)     |
| DAP                                  | "            | 100.5 (4)    | 91.3 (4)      | 94.1 (4)      |
| Average level of all area            |              |              |               |               |
| Urea                                 | kg/ha        | 12.9         | 176.2         | 130.0         |
| TSP                                  | "            | 8.3          | 106.1         | 74.7          |
| MP                                   | "            | 3.7          | 28.6          | 20.3          |
| DAP                                  | "            | 3.7          | 3.7           | 3.7           |
| Total                                | "            | 28.6         | 314.6         | 228.7         |
| Use of organic manure                |              |              |               |               |
| Average level of application in area |              |              |               |               |
| Farmyard manure                      | kg/ha (%)    | 2,647.0 (5)  | 6,197.9 (26)  | 5,930.4 (19)  |
| Compost                              | "            | 0 (0)        | 5,128.0 (0.2) | 5,128.0 (0.1) |
| Average level of all area            |              |              |               |               |
| Farmyard manure                      | kg/ha        | 129.1        | 1,614.0       | 1,125.2       |
| Compost                              | "            | 0            | 9.2           | 9.2           |
| Ashes                                |              |              |               |               |
| Average level of application area    | kg/ha (%)    | 0 (0)        | 2,471.8 (16)  | 2,471.8 (11)  |
| " of all area                        | kg/ha        | 0            | 396.6         | 267.5         |
| Use of pesticide                     |              |              |               |               |
| Average level of application area    | kg/ha (%)    | 1.6 (7)      | 3.5 (39)      | 3.3 (29)      |
| " of all area                        | kg/ha        | 0.1          | 1.3           | 0.9           |
| Use of labor                         |              |              |               |               |
| Land preparation                     | Workdays/ha  | 30.29        | 43.29         | 39.21         |
| Planting-transplanting               | "            | 37.83        | 44.68         | 42.55         |
| Fertilizer basal application         | "            | 0.25         | 2.47          | 1.78          |
| Fertilizer topdressing               | "            | 0.12         | 1.53          | 1.09          |
| Organic fertilizer application       | "            | 0.22         | 2.50          | 1.78          |
| Pesticide application                | "            | 0.10         | 0.96          | 0.69          |
| Weeding                              | "            | 37.83        | 44.68         | 42.55         |
| Irrigation                           | "            | 20.85        | 7.49          | 11.66         |
| Harvesting                           | "            | 41.39        | 43.66         | 42.92         |
| Threshing                            | "            | 17.02        | 21.32         | 19.99         |
| Winnowing                            | "            | 10.45        | 9.49          | 9.81          |
| Total labor use                      | "            | 196.35       | 222.07        | 214.03        |
| Use of animal power                  |              |              |               |               |
| Land preparation                     | pair · hr/ha | 242          | 346           | 314           |
| Threshing                            | "            | 77           | 89            | 84            |
| Total use of animal power            | "            | 319          | 435           | 398           |
| Use of mechanical equipment          |              |              |               |               |
| Land preparation                     | hr/ha        | 0            | 0             | 0             |
| Irrigation                           | "            | 58.3         | 114.4         | 96.9          |
| Threshing                            | "            | 17.0         | 34.3          | 28.9          |
| Total use of mechanical equipment    | "            | 75.3         | 148.7         | 125.8         |

( ) Percent of the land treated with fertilizer out of the total land.

Source: Agricultural Production, Fertilizer Use, and Equity Consideration IPDC, Feb, 1984.

TABLE 3-4 YIELD AND INPUT USE ON WHEAT  
1981/82 IN SAMPLE AREA

|                                      |              | Wheat 1981/82 |              |              |
|--------------------------------------|--------------|---------------|--------------|--------------|
|                                      |              | LV            | HYV          | All Wheat    |
| Crop production average yield        | kg/ha        | 1,481         | 1,430        | 1,434        |
| Use of chemical fertilizer           |              |               |              |              |
| Average level of application area    |              |               |              |              |
| Urea                                 | kg/ha (%)    | 70.1(37)      | 92.2(69)     | — (67)       |
| TSP                                  | "            | 174.3(11)     | 111.6(46)    | 112.5(43)    |
| MP                                   | "            | 100.5(11)     | 53.5(32)     | 55.3(30)     |
| DAP                                  | "            | 58.1(1)       | 88.2(2)      | 80.2(2)      |
| Average level of all area            |              |               |              |              |
| Urea                                 | kg/ha        | 25.8          | 63.6         | —            |
| TSP                                  | "            | 19.4          | 51.6         | 48.0         |
| MP                                   | "            | 11.1          | 17.5         | 16.6         |
| DAP                                  | "            | 0.9           | 1.8          | 1.8          |
| Total                                | "            | 57.2          | 134.5        |              |
| Use of organic manure                |              |               |              |              |
| Average level of application in area |              |               |              |              |
| Farmyard manure                      | kg/ha (%)    | 6,299.3(43)   | 4,482.4(43)  | 4,639.2(43)  |
| Compost                              | "            | 1,540.2(1)    | 3,763.0(0.3) | 3,200.4(0.3) |
| Average level of all area            |              |               |              |              |
| Farmyard manure                      | kg/ha        | 2,711.6       | 1,927.6      | 1,992.2      |
| Compost                              | "            | 18.4          | 9.2          | 9.2          |
| Ashes                                |              |               |              |              |
| Average level of application area    | kg/ha (%)    | 4,574.6(32)   | 1,697.0(19)  | 2,093.6(20)  |
| " of all area                        | kg/ha        | 1,466.5       | 322.8        | 415.0        |
| Use of pesticide                     |              |               |              |              |
| Average level of application area    | kg/ha (%)    | 0(0)          | 3.3(1)       | 3.3(1)       |
| " of all area                        | kg/ha        | 0             | 0.0          | 0.0          |
| Use of labor                         | Workdays/ha  |               |              |              |
| Land preparation                     | "            | 25.48         | 32.49        | 31.93        |
| Planting-transplanting               | "            | 1.19          | 2.35         | 2.25         |
| Fertilizer basal application         | "            | 0.27          | 1.26         | 1.16         |
| Fertilizer topdressing               | "            | 0.35          | 0.86         | 0.82         |
| Organic fertilizer application       | "            | 9.88          | 4.23         | 4.70         |
| Pesticide application                | "            | 0             | 0.02         | 0.02         |
| Weeding                              | "            | 1.19          | 2.35         | 2.25         |
| Irrigation                           | "            | 0.52          | 2.84         | 2.64         |
| Harvesting                           | "            | 31.65         | 35.36        | 35.04        |
| Threshing                            | "            | 20.39         | 17.54        | 17.79        |
| Winnowing                            | "            | 8.30          | 7.17         | 7.26         |
| Total labor use                      |              | 99.22         | 106.47       | 105.86       |
| Use of animal power                  |              |               |              |              |
| Land preparation                     | pair · hr/ha | 203           | 259          | 255          |
| Threshing                            | "            | 27            | 49           | 47           |
| Total use of animal power            | "            | 230           | 308          | 302          |
| Use of mechanical equipment          |              |               |              |              |
| Land preparation                     | hr/ha        | 0             | 0            | 0            |
| Irrigation                           | "            | 3.7           | 9.9          | 9.4          |
| Threshing                            | "            | 39.3          | 27.7         | 28.7         |
| Total use of mechanical equipment    | "            | 43.0          | 37.6         | 38.1         |

( ) Percent of the land treated with fertilizer out of the total land.

Source: Agricultural Production, Fertilizer Use, and Equity Consideration IPDC, Feb, 1984.

TABLE 3-5 TRADED FERTILIZER AMOUNT BY KIND

(Unit: ton)

| Year    | Urea    | TSP     | MP     | DAP    | Gypsum | HP     | NPK    | SP    | PS    | Zinc  | Others | Total     |
|---------|---------|---------|--------|--------|--------|--------|--------|-------|-------|-------|--------|-----------|
| 1971/72 | 169,771 | 60,139  | 13,932 | -      | -      | -      | -      | -     | -     | -     | -      | 243,842   |
| 1972/73 | 276,780 | 88,914  | 18,468 | -      | -      | -      | -      | -     | -     | -     | -      | 383,662   |
| 1973/74 | 267,628 | 93,821  | 18,393 | -      | -      | -      | -      | -     | -     | -     | -      | 379,841   |
| 1974/75 | 174,195 | 75,175  | 17,509 | -      | -      | 11,455 | 1,235  | -     | -     | -     | -      | 279,569   |
| 1975/76 | 311,926 | 109,915 | 22,112 | -      | -      | 4,362  | 7,517  | 1,953 | -     | -     | -      | 457,785   |
| 1976/77 | 353,230 | 125,585 | 22,380 | -      | -      | 4,030  | 5,930  | 1,385 | -     | -     | -      | 512,600   |
| 1977/78 | 479,846 | 192,036 | 41,230 | -      | -      | 3,246  | 787    | 835   | 1,073 | -     | -      | 719,053   |
| 1978/79 | 468,990 | 174,270 | 44,011 | 37,638 | -      | 3,605  | 3,780  | 380   | 348   | -     | 735    | 733,757   |
| 1979/80 | 533,315 | 205,322 | 45,957 | 42,157 | -      | 3,015  | 7,908  | 84    | 83    | -     | 269    | 838,110   |
| 1980/81 | 559,766 | 215,067 | 45,204 | 41,736 | 1      | 2,744  | 10,354 | 6     | 23    | 183   | 101    | 875,179   |
| 1981/82 | 518,775 | 208,478 | 44,836 | 48,518 | -      | 383    | 7,512  | -     | 11    | 810   | -      | 829,323   |
| 1982/83 | 629,058 | 205,999 | 50,420 | 73,161 | 393    | -      | 8,810  | -     | 79    | 498   | -      | 968,418   |
| 1983/84 | 708,070 | 260,730 | 63,222 | 93,831 | 1,267  | -      | 190    | -     | 1,006 | 745   | -      | 1,129,060 |
| 1984/85 | 831,801 | 345,670 | 69,271 | 403    | 1,378  | -      | 10,174 | -     | 306   | 1,217 | -      | 1,260,220 |

TSP: Triple Superphosphate, MP: Muriate of Potash, DAP: Diammonium Phosphate,  
 Gypsum: Calcium Sulphate, HP: Hyperphosphate, NPK: Nitrogen-Phosphate- Potassium Complex,  
 SP: Single Superphosphate, PS: Potassium Sulphate, Zinc: Zinc Sulphate

Source : BADC

TABLE 3-6 ESTIMATES OF THE SHARE OF VARIOUS CROPS IN FERTILIZER CONSUMPTION, 1969/70, 1977/78 & 1983/84

| Season & crops          | Percent of total fertilizer consumption |             |             |
|-------------------------|---|-------------|-------------|
|                         | 1969/70                                 | 1977/78     | 1983/84     |
| Aus season:             | <u>30.8</u>                             | <u>27.4</u> | <u>17.7</u> |
| Local Aus               | 24.6                                    | 10.6        | 7.0         |
| HYV Aus                 | 1.3                                     | 9.4         | 8.8         |
| Jute                    | 4.9                                     | 7.4         | 1.9         |
| Aman season:            | <u>33.5</u>                             | <u>37.3</u> | <u>39.1</u> |
| Broadcast Aman          | --                                      | --          | 0.9         |
| Local Transplanted Aman | 29.6                                    | 22.9        | 17.7        |
| HYV Aman                | 0.9                                     | 12.2        | 16.5        |
| Sugarcane               | 3.0                                     | 2.2         | 4.0         |
| Boro season:            | <u>35.7</u>                             | <u>35.3</u> | <u>43.3</u> |
| Local Boro              | 7.1                                     | 2.2         | 1.2         |
| HYV Boro                | 21.0                                    | 22.0        | 29.2        |
| Wheat                   | 1.6                                     | 2.5         | 6.1         |
| Other Rabi crops        | 6.0                                     | 8.6         | 6.8         |
| TOTAL                   | 100.0                                   | 100.0       | 100.0       |
| HYV Paddy & Wheat       | 24.8                                    | 46.1        | 60.6        |
| Irrigated Crops         | 28.2                                    | 39.0        | 44.1        |

Source: Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh, International Food Policy Research Institute / Bangladesh Institute of Development Studies Fertilizer Pricing Policy Study Team, March, 1985

TABLE 3-7 FERTILIZER PROCUREMENT BY BADC

(Unit: MT)

|          | UREA   |         |            |     |          |         |           |         |            |         | total   | TSP    |                   | total  | MP<br>(I) | Gypsum<br>(D) | HP<br>(I) | NPK<br>(I) | others<br>(I) |                   |
|----------|--------|---------|------------|-----|----------|---------|-----------|---------|------------|---------|---------|--------|-------------------|--------|-----------|---------------|-----------|------------|---------------|-------------------|
|          | Polash |         | Fenchugonj |     | Ashugonj |         | Sub Total |         | Chittagong |         |         | total  | Chittagong<br>(D) |        |           |               |           |            |               | Chittagong<br>(I) |
|          | (D)    | (I)     | (D)        | (I) | (D)      | (I)     | (D)       | (I)     | (D)        | (I)     |         |        |                   |        |           |               |           |            |               |                   |
| 1971/72  | -      | -       | 56,856     | -   | -        | 56,856  | 108,833   | 165,689 | -          | 2,732   | 2,732   | -      | -                 | -      | -         | -             | -         | -          | -             |                   |
| 1972/73  | -      | 153,209 | 36,459     | -   | -        | 189,668 | 125,583   | 315,251 | -          | 118,121 | 118,121 | -      | -                 | -      | -         | -             | -         | -          | -             |                   |
| 1973/74  | -      | 210,488 | 63,157     | -   | -        | 273,645 | -         | 273,645 | -          | 97,087  | 97,087  | -      | -                 | -      | -         | 10,850        | -         | -          | -             |                   |
| 1974/75  | -      | 23,832  | 59,835     | -   | -        | 83,667  | 142,283   | 225,950 | 24,393     | 48,181  | 72,574  | 24,393 | 41,225            | -      | -         | 13,100        | 17,400    | 5,000      | -             |                   |
| 1975/76  | -      | 237,542 | 47,468     | -   | -        | 285,010 | 72,313    | 357,323 | 39,813     | 222,734 | 262,547 | 39,813 | 37,381            | -      | -         | -             | -         | -          | -             |                   |
| 1976/77  | -      | 202,907 | 71,331     | -   | -        | 274,238 | 11,000    | 285,238 | 43,810     | 20,781  | 64,591  | 43,810 | 10,000            | -      | -         | -             | -         | -          | -             |                   |
| 1977/78  | -      | 153,990 | 75,845     | -   | -        | 229,835 | 266,355   | 496,190 | 38,361     | 114,597 | 152,958 | 38,361 | 37,501            | -      | -         | -             | -         | -          | -             |                   |
| 1978/79  | -      | 228,734 | 50,118     | -   | -        | 278,852 | 348,542   | 627,394 | 60,185     | 103,522 | 163,707 | 60,185 | 76,747            | 83,722 | -         | 6,003         | 3,936     | 1,500      | -             |                   |
| 1979/80  | -      | 225,273 | 84,016     | -   | -        | 309,289 | 286,269   | 595,558 | 58,883     | 173,564 | 232,447 | 58,883 | 60,031            | 42,235 | -         | 3,300         | 8,000     | -          | -             |                   |
| 1980/81  | -      | 246,254 | 111,570    | -   | -        | 357,824 | 63,938    | 421,762 | 74,236     | 193,658 | 267,894 | 74,236 | 42,335            | 32,181 | -         | -             | 18,001    | 1,500      | -             |                   |
| 1981/82  | -      | 243,535 | 114,059    | -   | 61,916   | 419,510 | 254,329   | 673,839 | 66,319     | 147,315 | 213,634 | 66,319 | 26,000            | 36,888 | -         | -             | -         | -          | -             |                   |
| 1982/83  | -      | 222,281 | 86,051     | -   | 118,146  | 426,478 | 43,009    | 469,487 | 66,522     | 135,085 | 201,607 | 66,522 | 44,000            | 71,685 | 1,473     | -             | 9,400     | -          | -             |                   |
| 1983/84  | -      | 195,342 | 65,997     | -   | 378,973  | 640,312 | 93,525    | 733,837 | 74,458     | 123,807 | 198,265 | 74,458 | 60,000            | 76,420 | 1,146     | -             | -         | 2,561      | -             |                   |
| 1984/85  | -      | 209,111 | 108,775    | -   | 387,980  | 705,866 | 170,850   | 876,716 | 59,812     | 407,676 | 467,488 | 59,812 | 75,000            | -      | 1,835     | -             | 11,526    | 1,500      | -             |                   |
| 1985/86* | 12,276 | 173,282 | 68,133     | -   | 345,861  | 599,522 | 162,748   | 762,300 | 65,230     | 356,092 | 421,322 | 65,230 | 67,200            | -      | 1,080     | -             | -         | -          | 1,000         |                   |

(D) Domestic Products

(I) Imports

\* 1985-86: Procurement by Feb. 1986

Source: BADC Fertilizer News letter.

TABLE 3-8 FERTILIZER IMPORT BY ASSISTING AGENCIES

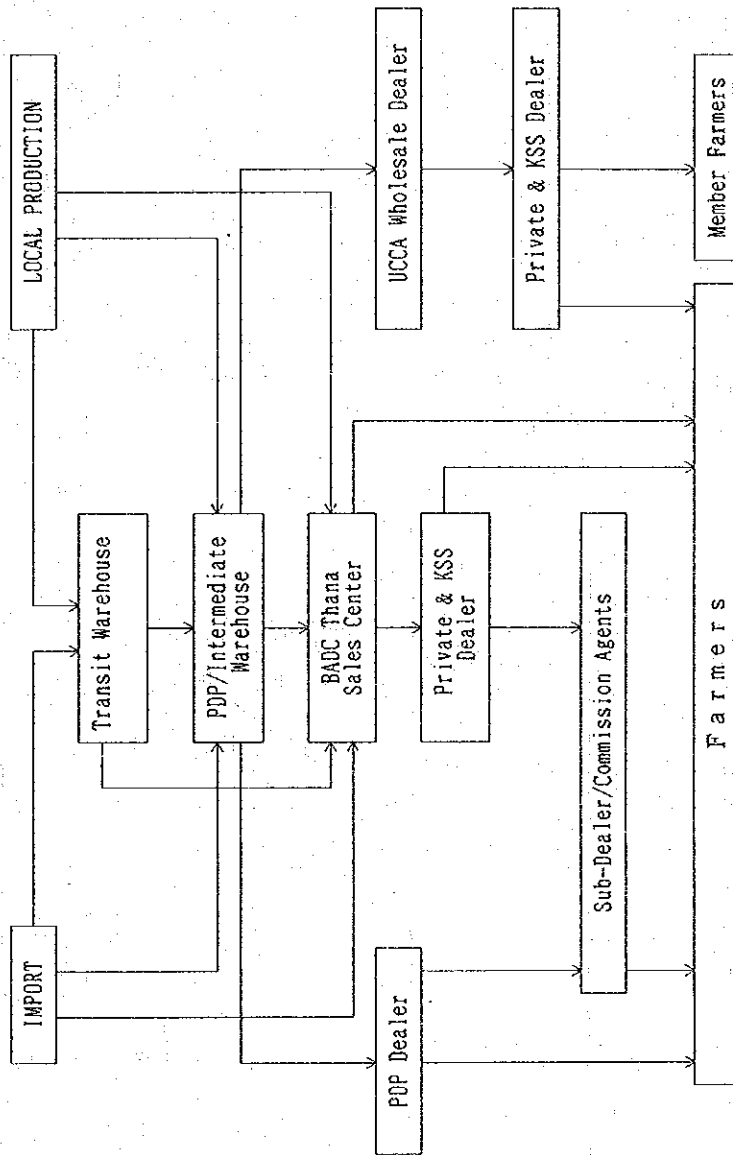
(Unit: MT)

|                                     | 1980/81  | 1981/82  | 1982/83  | 1983/84   | 1984/85  | 1985/86  |
|-------------------------------------|--|--|--|---|--|--|
| UREA                                | Saudi Grant<br>BEC Credit<br>45,100<br>18,836<br><u>63,936</u>   | NORAD Grant<br>IFAD Loan<br>OPEC Loan<br>IDA<br>Saudi Grant<br>Bulgarian Barter<br>Dutch Grant<br>10,100<br>14,521<br>50,288<br>35,550<br>74,750<br>22,220<br>46,900<br><u>254,329</u> | Saudi Grant<br>Japanese Grant<br>33,150<br>9,859<br><u>43,009</u>  | USAID<br>Saudi Grant<br>CAHS F.E.<br>50,462<br>14,051<br>29,042<br><u>93,555</u>  | USAID<br>Dutch Grant<br>Cash F.E.<br>NORAD Grant<br>106,344<br>26,114<br>25,792<br>12,600<br><u>170,850</u>  | K.R. Grant<br>TCB/TCP<br>IOB Loan<br>23,500<br>38,093<br>101,155<br><u>162,748</u> |
| TSP                                 | IFD Loan<br>ADB Loan<br>IDA Credit<br>Dutch Loan<br>Danish Grant<br>USAID<br>Japanese Grant<br>Dutch Special<br>Grant<br>24,550<br>8,800<br>65,600<br>20,800<br>15,000<br>31,500<br>16,908<br>10,500<br><u>192,658</u> | IDA<br>OPEC Loan<br>ADB Loan<br>Dutch Grant<br>Danish Grant<br>FRG(KFW) Grant<br>NORAD Grant<br>15,120<br>2,205<br>9,900<br>72,315<br>15,500<br>16,575<br>15,700<br><u>147,315</u>     | Danish Grant<br>Dutch Grant<br>Bulgarian Barter<br>Japanese Grant<br>40,101<br>64,203<br>21,976<br>8,805<br><u>135,085</u> | NORAD Grant<br>U.K. Assistance<br>ADB Loan<br>IFAD Loan<br>Dutch Grant<br>Danish Grant<br>KFW<br>17,443<br>5,000<br>8,580<br>8,400<br>30,100<br>45,248<br>9,036<br><u>123,807</u> | Rumanian Barter<br>ADB<br>BEC Grant<br>Dutch Grant<br>Cash F.E.<br>Danish Grant<br>K.F.W<br>TOB-SOKAB<br>TOB-CONTRAD<br>BULGARIA Barter<br>28,140<br>111,095<br>72,400<br>48,500<br>19,500<br>36,719<br>9,000<br>37,599<br>15,000<br>29,723<br>407,676<br><u>356,092</u> |  |
| DAP                                 | USAID<br>IDA Credit<br>21,000<br>15,181<br><u>36,181</u>   | IFAD Loan<br>FRG(KFW) Grant<br>NORAD Grant<br>13,088<br>14,400<br>9,400<br><u>36,888</u>   | USAID<br>71,685<br><u>71,685</u>   | USAID<br>NORAD Grant<br>CZECH Barter<br>Bulgarian Barter<br>24,990<br>5,880<br>20,997<br>24,553<br>76,420<br><u>76,420</u>  |  |  |
| MP                                  | CIDA Grant<br>42,335<br><u>42,335</u>  | CIDA Grant<br>26,000<br><u>26,000</u>  | CIDA Grant<br>44,000<br><u>44,000</u>  | CIDA Grant<br>60,000<br><u>60,000</u>   | CIDA Grant<br>75,000<br><u>75,000</u>  | CIDA<br>NORAD Grant<br>47,250<br>19,950<br><u>67,200</u>                           |
| NPK                                 | Norad Grant<br>Finich Grant<br>8,500<br>9,500<br>18,000<br><u>18,000</u>   |  | NORAD Grant<br>9,400<br><u>9,400</u>   |   | NORAD Grant<br>11,526<br><u>11,526</u>   |  |
| Zinc Sulfote<br>Zinc Oxy<br>Sulfote | USAID<br>500<br><u>1,500</u>   |  |  | USAID<br>1,561<br><u>1,561</u>  | IFAD<br>1,500<br><u>1,500</u>  |  |
| PS                                  |  |  | Yen credit<br>1,000<br><u>1,000</u>  |   |  | Debt Relief<br>1,000<br><u>1,000</u>   |

Source: BADC Fertilizer News letter



FIG. 3-2 FERTILIZER DISTRIBUTION SYSTEM



PDP : Primary Distribution Point

UCCA: Upa-zila Central Cooperative Association, Ltd.

KSS : Krishak Samabaya Samity (Farmers' Cooperative Society)

Source : Ministry of Agriculture

FIG. 3-3 ACTUAL CLOSING AND TARGETTED STOCK OF FERTILIZER

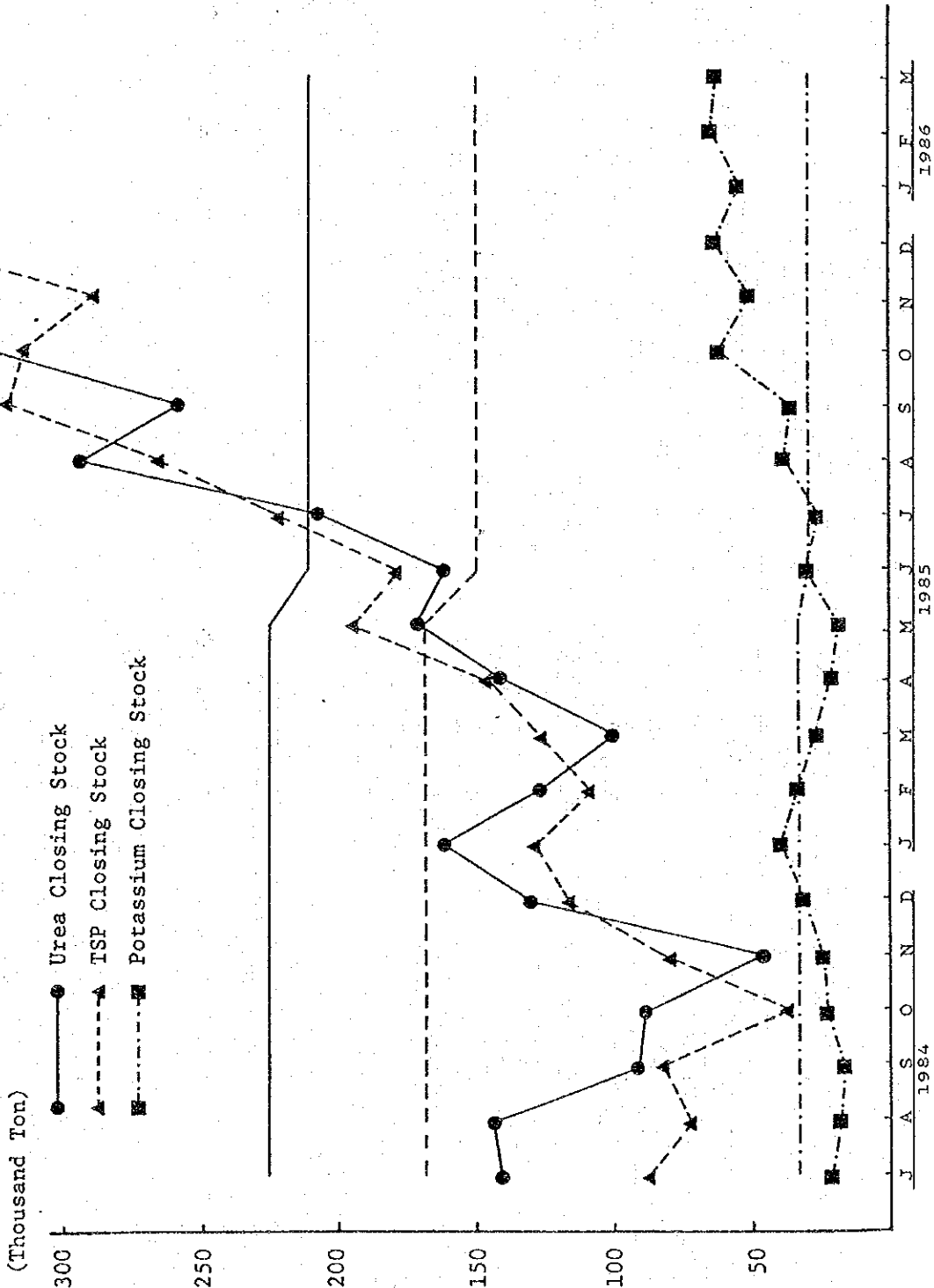


TABLE 3.9 FLUCTUATION OF FERTILIZER RETAIL PRICES  
SUPPORTED BY BADC  
(Unit: Taka)

|           | TSP        |           |          |           |          |          |          |          |          |          |          |          |          |
|-----------|------------|-----------|----------|-----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
|           | Urea       |           |          |           |          |          | MP       |          |          |          |          |          | BAP      |
|           | (Granular) |           |          | (Powder)  |          |          | (P.T)    |          |          | (P.N.T)  |          |          |          |
| (P.T)     | (P.N.T)    | (P.T)     | (P.N.T)  | (P.T)     | (P.N.T)  | (P.T)    | (P.N.T)  | (P.T)    | (P.N.T)  | (P.T)    | (P.N.T)  | (P.T)    | (P.N.T)  |
| 1975/76   | 1,361.00   | 3,024.45  | 1,088.80 | 2,366.96  | -        | -        | 816.60   | 1,361.00 | -        | -        | -        | -        | -        |
| 1976/77   | 1,633.20   | 3,550.44  | 1,306.56 | 2,840.35  | -        | -        | 1,088.80 | 1,814.67 | -        | -        | -        | -        | -        |
| Jul. 1977 | 1,633.20   | 3,550.44  | 1,306.56 | 2,840.35  | -        | -        | 1,088.80 | 1,814.67 | -        | -        | -        | -        | -        |
| Nov. 1977 | 1,633.20   | 3,550.44  | 1,306.56 | 2,840.35  | -        | -        | 1,088.80 | 1,814.67 | -        | -        | -        | -        | -        |
| Jul. 1978 | 1,905.40   | 4,142.17  | 1,497.10 | 3,254.57  | -        | -        | 1,224.90 | 2,041.50 | -        | -        | -        | -        | -        |
| Aug. 1979 | 2,449.80   | 5,325.65  | 1,905.40 | 4,142.17  | 1,633.20 | 3,550.93 | 1,497.10 | 2,495.17 | 2,449.80 | 3,827.81 | 4,678.44 | 2,994.20 | 4,678.44 |
| Nov. 1980 | 2,994.20   | 6,509.13  | 2,449.80 | 5,325.65  | 2,177.60 | 4,733.91 | 1,905.40 | 3,175.67 | 2,994.20 | 4,678.44 | 5,614.13 | 4,082.02 | 5,614.13 |
| Dec. 1981 | 3,593.04   | 7,810.96  | 3,130.30 | 6,805.00  | 2,585.90 | 5,621.52 | 2,449.80 | 4,082.02 | 3,593.04 | 5,614.13 | 6,294.63 | 4,082.56 | 6,294.63 |
| Jul. 1982 | 4,028.56   | 8,757.74  | 3,810.80 | 8,284.35  | 2,994.20 | 6,509.13 | 2,994.20 | 4,990.33 | 4,028.56 | 6,294.63 | 7,408.94 | 4,028.56 | 7,408.94 |
| Jun. 1983 | 4,028.56   | 8,757.73  | 3,810.80 | 8,284.34  | 2,994.20 | 6,509.13 | 2,994.20 | 4,990.13 | 4,028.56 | 6,294.63 | 7,408.94 | 4,028.56 | 7,408.94 |
| Jul. 1984 | 4,431.42   | 9,633.52  | 4,191.88 | 9,112.78  | 3,293.62 | 7,160.04 | 3,293.62 | 5,489.37 | 4,431.42 | 6,924.09 | 8,000.00 | 4,431.42 | 8,000.00 |
| Jan. 1985 | 4,741.72   | 10,308.09 | 4,485.31 | 9,750.67  | 3,524.17 | 7,661.24 | 3,524.17 | 5,873.62 | 4,741.72 | 7,408.94 | 8,000.00 | 4,741.72 | 8,000.00 |
| Jul. 1985 | 4,800.00   | 10,434.78 | 4,550.00 | 9,891.30  | 3,575.00 | 7,771.74 | 3,575.00 | 5,958.34 | 4,800.00 | 7,500.00 | 8,000.00 | 4,800.00 | 8,000.00 |
| Mar. 1986 | 5,000.00   | 10,869.57 | 5,000.00 | 10,869.57 | -        | -        | 4,000.00 | 6,666.67 | 5,000.00 | 7,812.50 | 8,000.00 | 5,000.00 | 8,000.00 |

P. T. : Per Ton

P. N. T. : Per Nutrient Ton

Source: Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh  
International Food Policy Research Institute Bangladesh Institute of Development  
Studies Fertilizer Pricing Policy Study Team, March, 1985

TABLE 3-10 SUBSIDY RATIO OF FERTILIZER

| Year    | Rate of Subsidy |     |    |
|---------|-----------------|-----|----|
|         | Urea            | TSP | MP |
|         | (percent)       |     |    |
| 1975/76 | 52              | 74  | 71 |
| 1976/77 | 45              | 67  | 64 |
| 1977/78 | 36              | 65  | 51 |
| 1978/79 | 41              | 66  | 54 |
| 1979/80 | 28              | 61  | 55 |
| 1980/81 | -9              | 58  | 57 |
| 1981/82 | 13              | 51  | 43 |
| 1982/83 | 4               | 37  | 33 |
| 1983/84 | 11              | 38  | 32 |
| 1984/85 | 2               | 31  | 24 |

Source: Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh Vol. 1. Summary Report.

TABLE 3-11 FERTILIZER SUBSIDY IN BANGLADESH  
AND ITS SHARE OF THE AGRICULTURAL  
DEVELOPMENT BUDGET, 1977/78 TO 1984/85

| F. Y    | Subsidy      | Agricultural <sup>a</sup> /<br>Development<br>Budget | Subsidy as percent<br>of Agricultural<br>Development Budget |
|---------|--------------|--|---|
|         | (million Tk) |  | (percent)   |
| 1977/78 | 944          | 3,480  | 27.1  |
| 1978/79 | 1,286        | 4,688  | 27.4  |
| 1979/80 | 1,342        | 6,658  | 20.2  |
| 1980/81 | 1,172        | 7,548  | 15.5  |
| 1981/82 | 1,084        | 8,820  | 12.3  |
| 1982/83 | 850          | 9,505  | 8.9   |
| 1983/84 | 1,426        | 10,511   | 13.6  |
| 1984/85 | 812          | unknown  | -   |

<sup>a</sup>/ Agriculture sector includes agriculture (crops, livestock, fisheries, forestry), rural development, and water resources development.

Source: Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh Vol. 1. Summary Report.

FIG. 3-4 PAST AND PROJECTED TREND OF DOMESTIC PRODUCTION AND CONSUMPTION OF FERTILIZER

(Thousand Ton)

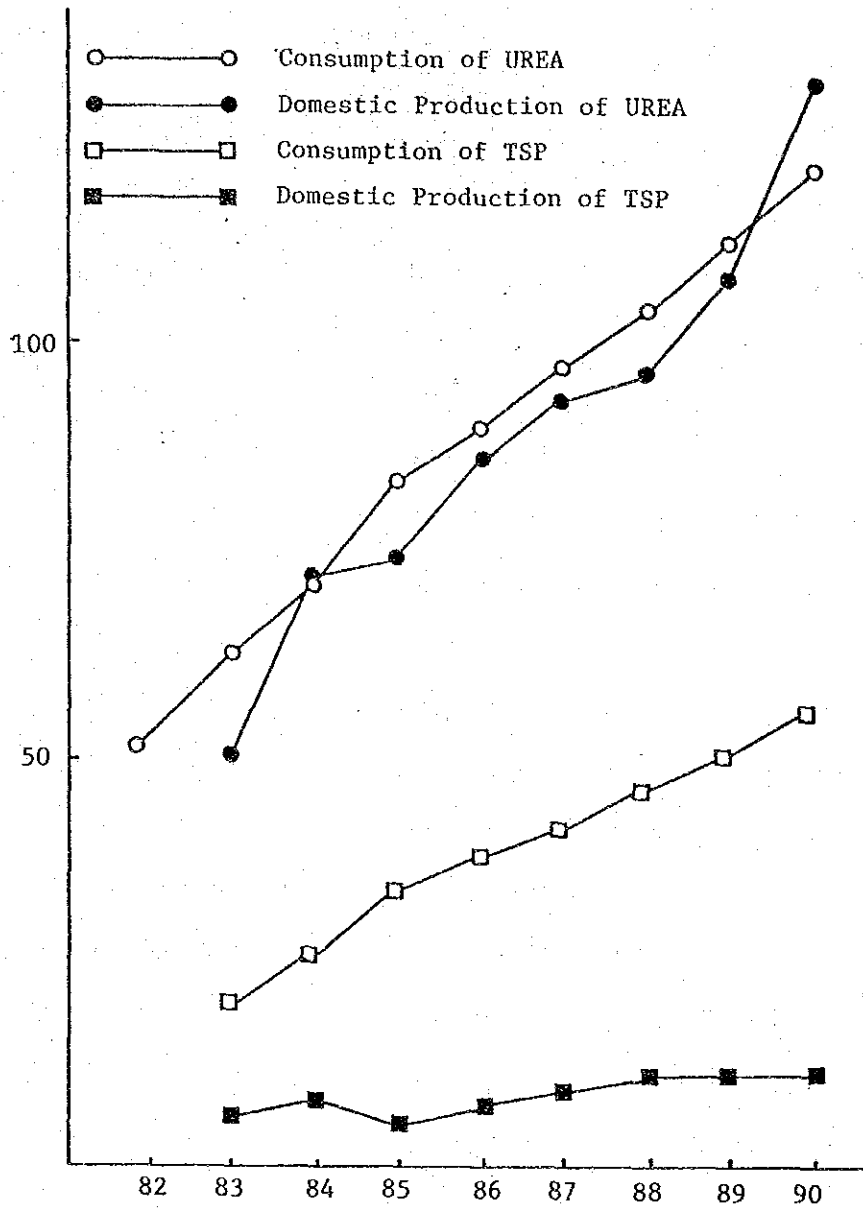


TABLE 3-12 FERTILIZER RECOMMENDATION OF BARC (1985)

unit: kg/ha

|                     | HYV under transplant culture, Aus and I. Aman Season |                               |                  |    |                | HYV under transplant culture, Boro Season |                               |                  |    |                | LV under transplant culture, I. Aman Season |                               |                  |    |                |
|---------------------|--|-------------------------------|------------------|----|----------------|---|-------------------------------|------------------|----|----------------|---|-------------------------------|------------------|----|----------------|
|                     | N  | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O | S  | Z <sub>n</sub> | N   | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O | S  | Z <sub>n</sub> | N   | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O | S  | Z <sub>n</sub> |
| High Yield Goal     | (4.0 ~ 5.5ton/ha)                                    |                               |                  |    |                | (5.5 ~ 7.0ton/ha)                         |                               |                  |    |                | (3.3 ~ 4.0ton/ha)                           |                               |                  |    |                |
| Soil Fertility      | 100  | 80                            | 80               | 20 | 5              | 140                                       | 100                           | 100              | 30 | 8              | 80  | 60                            | 40               | 10 | 4              |
|                     | 80   | 60                            | 40               | 10 | 3              | 100                                       | 80                            | 60               | 15 | 4              | 60  | 40                            | 20               | -  | -              |
|                     | 60   | 40                            | 20               | -  | -              | 80  | 60                            | 40               | -  | -              | 40  | 20                            | -                | -  | -              |
| Moderate Yield Goal | (3.0 ~ 3.9ton/ha)                                    |                               |                  |    |                | (4.0 ~ 5.4ton/ha)                         |                               |                  |    |                | (2.5 ~ 3.2ton/ha)                           |                               |                  |    |                |
| Soil Fertility      | 80   | 60                            | 40               | 10 | 3              | 100                                       | 80                            | 60               | 20 | 6              | 60  | 40                            | 20               | -  | -              |
|                     | 60   | 40                            | 20               | -  | -              | 80  | 60                            | 40               | 10 | 3              | 40 (87)                                     | 20 (43)                       | -                | -  | -              |
|                     | 40   | 20                            | -                | -  | -              | 60  | 40                            | 20               | -  | -              | 20  | -                             | -                | -  | -              |
| Low Yield Goal      | (2.0 ~ 2.9ton/ha)                                    |                               |                  |    |                | (2.5 ~ 3.9ton/ha)                         |                               |                  |    |                | (1.7 ~ 2.4ton/ha)                           |                               |                  |    |                |
| Soil Fertility      | 60   | 40                            | 20               | -  | -              | 80  | 60                            | 40               | 10 | 4              | 40  | 20                            | -                | -  | -              |
|                     | 40   | 20                            | -                | -  | -              | 60  | 40                            | 20               | -  | -              | 20  | -                             | -                | -  | -              |
|                     | 20   | -                             | -                | -  | -              | 40  | 20                            | -                | -  | -              | -   | -                             | -                | -  | -              |
|                     | Wheat  |                               |                  |    |                |   |                               |                  |    |                |   |                               |                  |    |                |
|                     | LV under broadcast dry seeded culture Aus Season     |                               |                  |    |                | LV under transplant culture, Boro Season  |                               |                  |    |                | LV under transplant culture, Boro Season    |                               |                  |    |                |
|                     | N  | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O | S  | Z <sub>n</sub> | N   | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O | S  | Z <sub>n</sub> | N   | P <sub>2</sub> O <sub>5</sub> | K <sub>2</sub> O | S  | Z <sub>n</sub> |
| High Yield Goal     | (2.3 ~ 3.0ton/ha)                                    |                               |                  |    |                | (2.5 ~ 3.2ton/ha)                         |                               |                  |    |                | (5.0 ~ 6.5ton/ha)                           |                               |                  |    |                |
| Soil Fertility      | /  | /                             | /                | /  | /              | 80  | 60                            | 40               | 10 | 4              | 160   | 100                           | 100              | 30 | 10             |
|                     | /  | /                             | /                | /  | /              | 60  | 40                            | 20               | -  | -              | 120   | 80                            | 60               | 20 | 5              |
|                     | /  | /                             | /                | /  | /              | 40  | 20                            | -                | -  | -              | 80  | 50                            | 10               | -  | -              |
| Moderate Yield Goal | (2.3 ~ 3.0ton/ha)                                    |                               |                  |    |                | (2.5 ~ 3.2ton/ha)                         |                               |                  |    |                | (4.0 ~ 4.9ton/ha)                           |                               |                  |    |                |
| Soil Fertility      | 60   | 40                            | 20               | -  | -              | 60  | 40                            | 20               | 5  | 2              | 120   | 80                            | 80               | 20 | 8              |
|                     | 40   | 20                            | -                | -  | -              | 40  | 20                            | -                | -  | -              | 80  | 60                            | 60               | 10 | 2              |
|                     | 20   | -                             | -                | -  | -              | 20  | -                             | -                | -  | -              | 60  | 20                            | 20               | -  | -              |
| Low Yield Goal      | (1.5 ~ 2.2ton/ha)                                    |                               |                  |    |                | (1.7 ~ 2.4ton/ha)                         |                               |                  |    |                | (2.0 ~ 3.9ton/ha)                           |                               |                  |    |                |
| Soil Fertility      | 40   | 20                            | -                | -  | -              | 40  | 20                            | -                | -  | -              | 80  | 60                            | 60               | 10 | 4              |
|                     | 20   | -                             | -                | -  | -              | 20  | -                             | -                | -  | -              | 60  | 20                            | 20               | -  | -              |
|                     | -  | -                             | -                | -  | -              | -   | -                             | -                | -  | -              | 40  | -                             | -                | -  | -              |

( ) : Estimated Yield

Source: BARC

TABLE 3-13 ESTIMATION OF FERTILIZER APPLICATION

|                      | Aus     |        |           | Aman    |         |           | Boro   |         |           | ALL Paddy |         |           | Marketed Fertilizer Quantity |
|----------------------|---------|--------|-----------|---------|---------|-----------|--------|---------|-----------|-----------|---------|-----------|------------------------------|
|                      | LV      | HYV    | Sub-Total | LV      | HYV     | Sub-Total | LV     | HYV     | Sub-Total | LV        | HYV     | Sub-Total |                              |
|                      |         |        |           |         |         |           |        |         |           |           |         |           |                              |
| 1983/84年             |         |        |           |         |         |           |        |         |           |           |         |           |                              |
| Cropped Area (ha)    | 2,639   | 500    | 3,139     | 4,944   | 1,064   | 6,008     | 335    | 1,066   | 1,401     | 7,918     | 2,630   | 10,548    |                              |
| Urea Application(MT) | 229,593 | 65,000 | 294,593   | 430,128 | 138,320 | 568,448   | 29,145 | 185,484 | 214,627   | 688,866   | 388,804 | 1,077,670 | 708,000                      |
| TSP Application(MT)  | 113,477 | 45,000 | 158,477   | 212,592 | 95,760  | 308,352   | 14,405 | 138,580 | 152,985   | 340,474   | 279,340 | 619,814   | 260,730                      |
| MP Application(MT)   | -       | 16,500 | 16,500    | -       | 35,112  | 35,112    | -      | 71,422  | 71,422    | -         | 123,034 | 123,034   | 63,220                       |
| 1984/85年             |         |        |           |         |         |           |        |         |           |           |         |           |                              |
| Cropped Area (ha)    | 2,363   | 482    | 2,845     | 4,630   | 1,080   | 5,710     | 344    | 1,230   | 1,574     | 7,337     | 2,792   | 10,129    |                              |
| Urea Application(MT) | 205,581 | 62,660 | 268,241   | 402,810 | 140,400 | 543,210   | 29,928 | 214,020 | 243,948   | 638,319   | 417,080 | 1,055,399 | 831,801                      |
| TSP Application(MT)  | 101,609 | 43,380 | 144,989   | 199,090 | 97,200  | 296,290   | 14,792 | 159,900 | 174,692   | 315,471   | 300,480 | 615,971   | 345,670                      |
| MP Application(MT)   | -       | 15,906 | 15,906    | -       | 35,640  | 35,640    | -      | 82,410  | 82,410    | -         | 133,956 | 133,956   | 67,000                       |
| 1989/90年(Projected)  |         |        |           |         |         |           |        |         |           |           |         |           |                              |
| Cropped Area (ha)    | 2,363   | 547    | 2,910     | 4,630   | 1,200   | 5,830     | 344    | 1,596   | 1,940     | 7,337     | 3,343   | 10,680    |                              |
| Urea Application(MT) | 205,581 | 71,110 | 276,691   | 402,810 | 156,000 | 558,810   | 29,928 | 277,704 | 307,632   | 638,319   | 504,814 | 1,143,133 | 1,206,000                    |
| TSP Application(MT)  | 101,609 | 49,230 | 150,839   | 199,090 | 108,000 | 307,090   | 14,792 | 207,480 | 222,272   | 315,491   | 364,710 | 680,201   | 554,000                      |
| MP Application(MT)   | -       | 18,051 | 18,051    | -       | 39,600  | 39,600    | -      | 106,932 | 106,932   | -         | 164,583 | 164,583   | 105,000                      |



TABLE 3-14 INSECT DAMAGED AREA

|      | Rice Hispa<br>(1,000ha) | Green Leaf<br>Hopper (1,000ha) | Brown Plant<br>Hopper (1,000ha) | Paddy Planted<br>Area (1,000ha) |
|------|-------------------------|--------------------------------|---------------------------------|---------------------------------|
| 1981 | 453<br>(4.4%)           | 28<br>(0.3%)                   | no data                         | 10,310                          |
| 1982 | no data                 | 18<br>(0.2%)                   | no data                         | 10,460                          |
| 1983 | no data                 | 15<br>(0.1%)                   | 22<br>(0.2%)                    | 10,590                          |
| 1984 | 356<br>(3.4%)           | 15<br>(0.1%)                   | 12<br>(0.1%)                    | 10,590                          |
| 1985 | 607<br>(5.9%)           | 12<br>(0.1%)                   | 15<br>(0.1%)                    | 10,230                          |

Source: Ministry of Agriculture, Plant Protection Wing

TABLE 3-15 AGRO-CHEMICAL USE BY CROP

| Crop      | Ratio |
|-----------|-------|
| Paddy     | 90%   |
| Oil Seeds | 5     |
| Jute      | 1.5   |
| Sugarcane | 1.0   |
| Potato    | 2.0   |
| Coton     | 0.5   |
| Total     | 100   |

Source: Pesticide Association of Bangladesh

TABLE 3-16 RICE PESTS CONTROL PROGRAM  
AT A GLANCE 1985/86

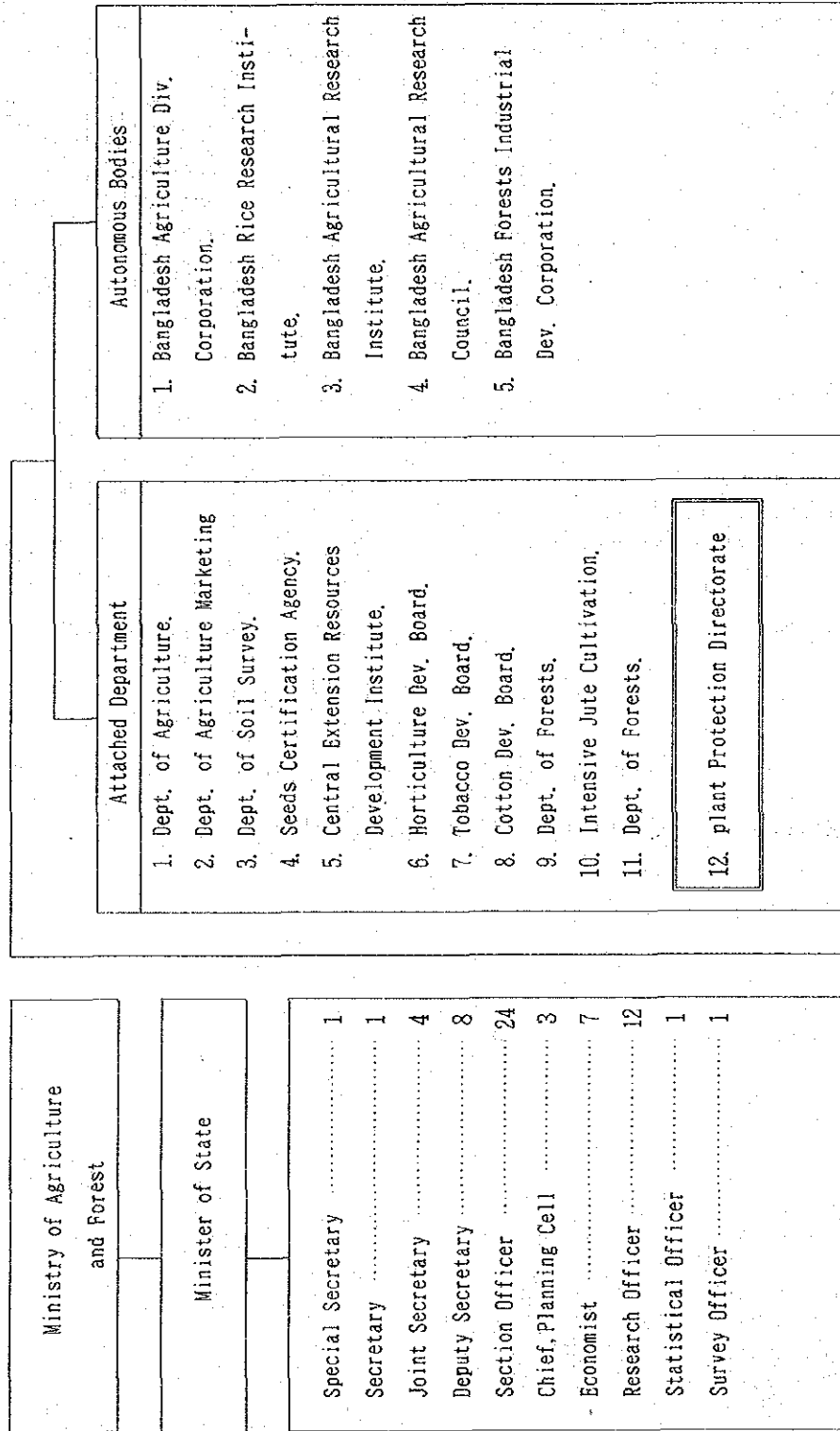
| Detail program   | Time Schedule    | Responsible Authority.  |
|--|------------------|---|
| Pests Control of T-Aman in Current Year.                   | July-Nov.        | Farmers   |
| Control of Swarming Catterpillar                           | Mid-Sep.         | - do -  |
| Control of Ear-cutting Catterpillar                        | Mid-Oct. & Nov.  | - do -  |
| Control of Rice Bug  | Nov.             | - do -  |
| <u>Control Measures of Rice Hispa</u>                      |                  |   |
| Land Ploughing & Burning<br>of Straw after Aman Harvesting | Nov-Dec.         | - do -  |
| Control of Hispa in the Tiling of Straw.                   | Nov-Dec.         | u/z Parishad  |
| Straw Burning in the High<br>Land after Aman Harvesting    | Nov-Dec.         | Farmers   |
| Keep the Seed Bed free from Insects/Pest                   | Nov-Jan.         | Farmers,<br>Extension Workers<br>Motivate the Farmers<br>in Sl. No. a, b, c.                    |
| Spraying of Insecticides by Plane<br>in the Marshy Land    | From mid<br>Dec. | Ministry of Agriculture<br>and Agricultural<br>Extension Div.                                   |
| Measures taken for Controlling Insects<br>in the Land      | Jan-May.         | u/z & u/z<br>Parishad   |
| Control of Brown Flies                                     | April-May.       | Farmers   |
| Control of Thrips  | Mar-April.       | Extension Workers<br>Symptoms of attacks<br>Farmers Control the<br>same.                        |
| Measures taken for Controlling the Pests                   | Whole Year       | Farmers   |
| Unitedly Pest Control                                      | - do -           | Block supervisor<br>Protection Plant<br>Inspector/Asstt.<br>Agril. Extension<br>Officer of DEM. |
| Rapid roving Rice Pest Survey                              | -                | - do -  |

(Continued)

| Detail program   | Time Schedule | Responsible Authority.  |
|--|---------------|---|
| Control of Rats  | Jan-15th Mar. | u/z panishad/pesticides Association of Bangladesh.<br>2 Suppliers of owner Society. |
| <u>Extension Media</u>   |               |   |
| I) Poster, Slide, Leaflet  | Nov-Mar.      | Agril extension Div<br>National broadcasting<br>UAD etc.                            |
| II) General Information  | - do -        |   |
| III) Film Exhibition   | - do -        |   |
| IV) Inform the People about the attach of Insect/Pest in the Market. | Whole Year    |   |
| V) Autonomous Broadcasting   | Whole Year    | Insecticides Companies.   |
| Evaluation   | Time to time  | Different Committe  |

Source: Ministry of Agriculture, Plant Protection Wing.

FIG. 3-5 ORGANIZATION OF MINISTRY OF AGRICULTURE



Note :  Concerned Agency

Source : Japan International Cooperation Agency

TABLE 3-17 INSECT DAMAGED AREA AND  
CONTROLLED AREA, 1984/85

(Unit : ha)

| Cropping season                | Insect                | Damaged Area | Controlled Area |             |                    |
|--------------------------------|-----------------------|--------------|-----------------|-------------|--------------------|
|                                |                       |              | Ground Spray    | Arial Spray | Total Sprayed Area |
| Boro<br>Oct. 1984-Apr. 1985    | Hispa                 | 84,880       | 52,180          | 21,280      | 73,460             |
|                                | Stemborer             | 2,800        | 1,440           | -           | 1,440              |
|                                | Brown Plant<br>Hopper | 10,400       | 4,800           | -           | 4,800              |
|                                | Total                 | 98,080       | 58,420          | 21,280      | 79,700             |
| Aus<br>Apr. 1985-May. 1985     | Hispa                 | 386,520      | 294,720         | 35,520      | 330,240            |
|                                | Stemborer             | 1,200        | 1,000           | -           | 1,000              |
|                                | Brown Plant<br>Hopper | 640          | 600             | -           | 600                |
|                                | Total                 | 388,360      | 296,320         | 35,520      | 331,840            |
| B. Aman<br>Apr. 1985-May. 1985 | Hispa                 | 59,280       | 46,600          | -           | 46,600             |
| T. Aman<br>July 1985-Aug. 1985 | Hispa                 | 69,000       | 42,930          | 5,390       | 48,320             |
| GRAND TOTAL                    |                       | 614,720      | 444,270         | 62,190      | 506,460            |

Source : Ministry of Agriculture, Plant Protection Wing

TABLE 3-18 RICE PROCUREMENT BY MINISTRY OF FOOD

(単位: 100,000, ton)

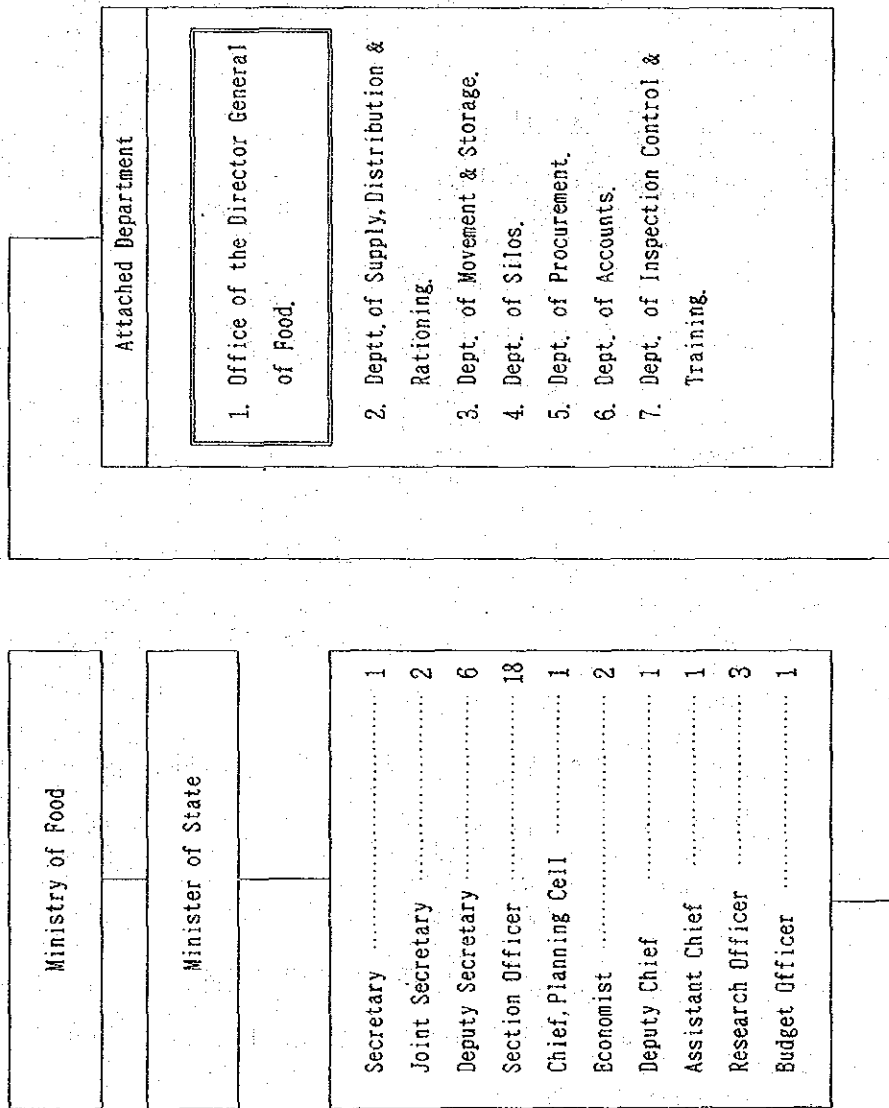
|         | Aman       |             |      | Boro       |             |      | Aus        |             |      | Total      |             |     |
|---------|------------|-------------|------|------------|-------------|------|------------|-------------|------|------------|-------------|-----|
|         | Production | Procurement | %    | Production | Procurement | %    | Production | Procurement | %    | Production | Procurement | %   |
| 1975/76 | 70.45      | 3.42        | 4.86 | 22.86      | 0.02        | 0.09 | 32.30      | —           | —    | 125.61     | 3.44        | 2.7 |
| 76/77   | 69.06      | 3.03        | 4.39 | 26.50      | 0.06        | 0.23 | 30.11      | —           | —    | 125.67     | 3.09        | 2.5 |
| 77/78   | 74.22      | 4.46        | 6.01 | 11.39      | 0.33        | 2.90 | 31.04      | 0.01        | 0.03 | 116.65     | 4.80        | 4.1 |
| 78/79   | 74.29      | 1.99        | 2.68 | 19.29      | 0.81        | 4.20 | 32.88      | 0.18        | 0.55 | 126.46     | 2.98        | 2.4 |
| 79/80   | 73.03      | 1.75        | 2.39 | 24.27      | 0.49        | 2.06 | 28.09      | —           | —    | 125.39     | 2.24        | 1.8 |
| 80/81   | 78.37      | 5.01        | 6.40 | 25.89      | 2.52        | 9.73 | 32.37      | 0.87        | 2.69 | 136.63     | 8.13        | 6.0 |
| 81/82   | 71.00      | 1.19        | 1.68 | 30.00      | 1.50        | 5.00 | 32.50      | 0.19        | 0.58 | 133.50     | 2.88        | 2.2 |
| 82/83   | 74.80      | 0.93        | 1.24 | 35.00      | 0.74        | 2.11 | 30.20      | 0.01        | 0.03 | 140.00     | 1.68        | 1.2 |
| 83/84   | 79.00      | 0.83        | 1.05 | 33.00      | 1.18        | 3.57 | 31.70      | 0.11        | 0.35 | 143.70     | 2.12        | 1.5 |

Note : Amount is in terms of rice.

※ : The percent is the ratio of total Procurement / Total Production.

Source : "Technical Support Development for the Public Food Storage Sector in Bangladesh" Ministry of Food.

FIG. 3-6 ORGANIZATION OF MINISTRY OF FOOD



Note :  Concerned Agency

Source : Japan International Cooperation Agency

TABLE 3-19 TOTAL IMPORTATION OF PESTICIDES

Value in US \$/, 000

| Year                | Pesticide Type | Finished products |           | Technical Material |          | Total        |           |
|---------------------|----------------|-------------------|-----------|--------------------|----------|--------------|-----------|
|                     |                | Volume mt/kl      | Value     | Volume mt/kl       | Value    | Volume mt/kl | Value     |
| 1980                | Insecticide    | 4,013.43          | 8,395.00  | -                  | -        | 4,013.43     | 8,395.00  |
|                     | Herbicide      | 24.35             | 84.84     | 70                 | 205      | 94.35        | 289.84    |
|                     | Fungicide      | 74.4              | 247.9     | -                  | -        | 74.40        | 247.90    |
|                     | Others         | 14.00             | 49.00     | -                  | -        | 14.00        | 49.00     |
|                     | Sub Total      | 4,126.18          | 8,776.74  | 70                 | 205      | 4,196.18     | 8,981.74  |
| 1981                | Insecticide    | 1,192.54          | 3,577.00  | -                  | -        | 1,192.54     | 3,577.00  |
|                     | Herbicide      | 9.58              | 28.54     | 77.057             | 225      | 86.637       | 253.54    |
|                     | Fungicide      | 67.00             | 223.27    | -                  | -        | 67.00        | 223.27    |
|                     | Others         | 12.00             | 40.02     | -                  | -        | 12.00        | 40.02     |
|                     | Sub Total      | 1,281.17          | 3,840.57  | 77.057             | 225      | 1,358.177    | 4,093.83  |
| 1982                | Insecticide    | 1,215.83          | 2,622.71  | -                  | -        | 1,215.83     | 2,622.71  |
|                     | Herbicide      | 15.00             | 35.94     | 30.8               | 76.21    | 45.80        | 112.15    |
|                     | Fungicide      | 34.53             | 105.02    | -                  | -        | 34.53        | 105.02    |
|                     | Others         | 9.2               | 82.29     | -                  | -        | 9.20         | 82.29     |
|                     | Sub Total      | 1,274.56          | 2,845.96  | 30.80              | 76.21    | 1,305.36     | 2,922.17  |
| 1983                | Insecticide    | 1,400.00          | 2,892.348 | 527.97             | 3,170    | 1,927.97     | 6,062.348 |
|                     | Herbicide      | 15.00             | 31.2      | 80.10              | 250      | 95.10        | 281.20    |
|                     | Fungicide      | 69.4              | 205.16    | -                  | -        | 69.40        | 205.16    |
|                     | Others         | 9.75              | 78.00     | -                  | -        | 9.75         | 78.00     |
|                     | Sub Total      | 1,494.15          | 3,206.708 | 608.07             | 4,028.07 | 2,101.92     | 6,626.70  |
| 1984                | Insecticide    | 1,979.68          | 3,465.48  | 539.69             | 3,266    | 2,519.37     | 6,731.48  |
|                     | Herbicide      | 12.00             | 28.7      | 74                 | 192.12   | 86.00        | 220.82    |
|                     | Fungicide      | 65.00             | 182.00    | -                  | -        | 165.00       | 182.00    |
|                     | Others         | 14.8              | 109.60    | -                  | -        | 14.80        | 109.60    |
|                     | Sub Total      | 2,071.48          | 3,785.78  | 613.69             | 3,458.12 | 2,685.17     | 7,243.9   |
| 1985<br>(Projected) | Insecticide    | 1,560.00          | 3,080.00  | 720.00             | 4,357.00 | 2,280.0      | 7,437.00  |
|                     | Herbicide      | 22                | 48.00     | 20                 | 51.92    | 40.0         | 99.92     |
|                     | Fungicide      | 70                | 202.00    | -                  | -        | 70.0         | 202.00    |
|                     | Others         | 20                | 142.00    | -                  | -        | 20.0         | 142.00    |
|                     | Sub Total      | 1,672             | 3,472.00  | 740.00             | 1,082.92 | 2,410.0      | 7,880.92  |

Source: Ministry of Agriculture, Plant Protection Wing



TABLE 3-20 PRICE FLUCTUATION OF  
MAJOR INSECTICIDE

(Unit : Taka/ℓ)

| Pesticide                          | Time | Time      |           |           |           |            |
|------------------------------------|------|-----------|-----------|-----------|-----------|------------|
|                                    |      | Mar. 1981 | Mar. 1983 | Mar. 1984 | Feb. 1985 | Feb. 1986  |
| Sumithion 50EC                     |      | 100 (36)  | 187 (67)  | 226 (81)  | 250 (89)  | 280 (100)※ |
| Diazinon 60EC                      |      | 187 (49)  | 307 (79)  | 300 (79)  | 300 (79)  | 379 (100)  |
| Elsan 50EC                         |      | —         | 303 (89)  | 250 (74)  | 250 (74)  | 339 (100)  |
| DBVP 100EC                         |      | —         | 220 (64)  | 273 (79)  | 273 (79)  | 344 (100)  |
| Nuvacrom 40SCW                     |      | 265 (68)  | 335 (86)  | 364 (93)  | 364 (93)  | 391 (100)  |
| Furadan 3G                         |      | 39 (68)   | 40 (70)   | 56 (98)   | 56 (98)   | 57 (100)   |
| Exchange Rate<br>in Taka to 100Yen |      | 7.5(47)   | 10.2(64)  | 11.2(70)  | 10.1(64)  | 15.9(100)  |

Notes : — ; no information

All prices are converted into Taka per litre

※ : Figures in ( ) are index to the unit price of Feb. 1986 by pesticide type.

Source : Pesticide Association of Bangladesh

TABLE 3-21 REGISTERED PESTICIDES

| No.                     | Common Name                           | Trade Name                           | No.               | Common Name                       | Trade Name  |
|-------------------------|---------------------------------------|--------------------------------------|-------------------|-----------------------------------|---|
| <b>ACARICIDES</b>       |                                       |                                      |                   |                                   |   |
| 1.                      | Bromopropylate                        | Neoron 500 EC                        | 13.               | Calcium Poly-sulphides.           | Limo Sulphur  |
| 2.                      | Dicofol                               | Kelthane 42 M. P.                    | 14.               | Edifenphos                        | Hinosan 50 % EC   |
| 3.                      | Ethion                                | Ethion 4 EC                          | 15.               | Mancozeb                          | Dithane M-45  |
| 4.                      | Micronisea<br>wetable<br>sulphur.     | Thiovit 80 W. P.<br>Kumulas-S        | 16.               | Micronised<br>Wetable<br>Sulphur. | Kumulus-S<br>Thiovit 80 WP  |
| 5.                      | Propergite                            | Omite 57 EC                          | 17.               | Tridemorph                        | Caixin  |
| 6.                      | Tetradifon                            | Tedion V 18                          | 18.               | Alluminium<br>Phosphide.          | Celphos<br>Detia Gas-EX-T<br>Phostoxin<br>Quickphos   |
| <b>FUNGICIDES</b>       |                                       |                                      |                   |                                   |   |
| Seed and Sett Treating. |                                       |                                      |                   |                                   |   |
| 7.                      | Carboxin<br>+ thiram.                 | Vitavax-200                          | 19.               | Methy Bromide.                    | Methyl Bromide.   |
| 8.                      | Methoxy ethyl<br>mercury<br>chloride. | Agallol-3<br>Aretan-6                | <b>HERBICIDES</b> |                                   |   |
| 9.                      | Mercuric Oxide<br>(yellow)            | Santar A                             | 20.               | 2,4 D                             | 2,4-D Amine<br>2,4-D Amine<br>2,4-D Amine<br>2,4-D Sodium Salt<br>2,4-D Sodium Salt<br>2,4-D Sodium Salt<br>U 46-D Fluid<br>R 46-D Powder |
| Foliar :                |                                       |                                      |                   |                                   |   |
| 10.                     | Cuprous Oxide                         | Copper Sandoz<br>WP.<br>Copper Oxide | 21.               | Dalapon-Na                        | Basfapon<br>Dalapon Na-85<br>Dalapon Na   |
| 11.                     | Bordeaux<br>Mixture &<br>Cufraneb.    | Macuprax                             | 22.               | Diuron                            | Karmex  |
| 12.                     | Copper Oxy-<br>chloride.              | Cupravit 50 WP                       | 23.               | Paraquat                          | Gramoxone   |
|                         |                                       |                                      | 24.               | Propanil                          | Surcopur 360 EC<br>Stam P-34  |

(Continued)

| No.                 | Common Name          | Trade Name  | No. | Common Name         | Trade Name   |
|---------------------|----------------------|---|-----|---------------------|--|
| <b>INSECTICIDES</b> |                      |   |     |                     |  |
| 25.                 | Gromophos            | Nexion 25 EC  | 36. | Dimethoate          | Daphene 40 EC<br>Perfekthion 40 EC<br>Rogor L-40<br>Roxion 40 EC   |
| 26.                 | Carbaryl             | Aerovin 85 WP<br>Carbin 85 SP<br>Naftil 85 SP<br>Sevin 85 SP<br>Sevin 10 % Dust   | 37. | Endosulfan          | Thiodan 35 EC  |
| 27.                 | Carbofuran           | Curaterr 36   | 38. | Penitrothion        | Agrothion 50 EC<br>Folithion 50 EC<br>Folithion 98 ULVC<br>Sumithion 50 EC<br>Sumithion 98 ULVC<br>Novathion 96 Tech |
| 28.                 | Carbosulfan          | Marshal 20 EC   | 39. | Fenthion            | Lebaycid 50 EC   |
| 29.                 | Cartap               | Padan 10 G<br>Padan 50 SP   | 40. | Fenvalerato         | Sumiciden 20 EC  |
| 30.                 | Chlordane            | Chlordane 40 WP   | 41. | Formothion          | Anthio 25 EC   |
| 31.                 | Cypermethrin         | Cymbush 10 EC<br>Ripcord 10 EC  | 42. | Heptachlor          | Heptachlor 40 WP   |
| 32.                 | Diazinon             | Basudin 10 G<br>Diazinon 14 G<br>Diazinon 14 G<br>Diatinon 50 EC<br>Diazinon 60 E<br>Diazinon 60 EC                     | 43. | Malathion           | Aeromal 57 EC<br>Diamal 57 EC<br>Ryfanon 57 EC<br>Malathion 57 EC<br>Malathion 98 ULVC<br>Zithiol 57 EC              |
| 33.                 | Dichlorvos /<br>DDVP | Aerovap 100 EC<br>Dichlorvos 100<br>Dichlorvos 100 EC<br>Nogos 100<br>Phosvit 100 EC<br>Vapona 100<br>Dankavepon 100 EC | 44. | Methacrifose        | Damfin 950<br>Damfin 2 P   |
| 34.                 | Dicrotophos          | Bidrin 24 WSC<br>Bidrin 85 WSC<br>Carbicron 50 SCW  | 45. | Monocrotophos.      | Azodrin 40 WSC<br>Nuvacrow 40 WSC  |
| 35.                 | Dieldrin             | Aerodriel 20 EC<br>Dieldrin 20 EC<br>Dieldrin 40 WP<br>Dieldrin 50 WP   | 46. | MIPC                | Mipcin 75 WP   |
|                     |                      |   | 47. | Oxydemeton<br>methy | Metasystox-R 25 EC   |
|                     |                      |   | 48. | Phenthoate          | Elsan 92 ULY<br>Elsan 50 EC<br>Cidial 50 L   |
|                     |                      |   | 49. | Phosalone           | Zolone 35 Ec   |

(Continued)

| No.          | Common Name            | Trade Name                       |
|--------------|------------------------|----------------------------------|
| 50.          | Primiphos methyl.      | Actellic 50 Ec                   |
| 51.          | Phosphamidon           | Dimecron 100                     |
| 52.          | Quinalphos             | Ekalux 25 EC<br>Ekalux 5 G       |
| 53.          | Tetrachlorvin-<br>phos | Gardona 75 WP                    |
| 54.          | Trichlorphon           | Dipterex 85 SP                   |
| RODENTICIDES |                        |                                  |
| 55.          | Coumatetralyl          | Racumin                          |
| 56.          | Sodium Cyanide.        | Cymag                            |
| 57.          | Zinc Phosphide.        | Zinc Phosphide<br>Zinc Phosphide |

Source : The Bangladesh Gazette, July 20, 1985

TABLE 3-22 LIST OF THE MEMBERS OF  
PESTICIDE ASSOCIATION

| <u>Local Company</u>                  | <u>Supplier</u>   |
|---------------------------------------|---|
| 1. Agro Enterprise                    | -   |
| 2. Agrani Traders                     | Rallies India   |
| 3. Bangladesh Agricultural Industries | -   |
| 4. BASP (BD) Ltd.                     | BASF West Germany   |
| 5. Beximco Agrochemicals              | Bayer (Ag), West Germany  |
| 6. Burmah Eastern Ltd.                | Shell Chemical U.K.<br>FMC Corporation, USA,<br>Mitsubishi Corporation Japan                                    |
| 7. B. P. I. Ltd.                      | Rhone Poulenc France Rohm & Hass USA,<br>Sandoz-Switzerland   |
| 8. Bayer (BD) Ltd.                    | -   |
| 9. Ciba-Geigy (BD) Ltd.               | Ciba-Geigy Switzerland,   |
| 10. Data Enterprises                  | Nippon Kuyake Japan<br>Nishan Chemical, Japan,<br>Fisons, U. K.   |
| 11. Fisons (BD) Ltd.                  | -   |
| 12. FMC Corporation                   | -   |
| 13. Hoechst Pharmaceuticals Co.       | Hoechst Pharmaceuticals Co.<br>West Germany.  |
| 14. ICI (BD) Manu Ltd.                | ICI<br>U. K.  |
| 15. Jamuna Oil Company Ltd.           | FMC Corporation USA   |
| 16. Krishi Banejya Protistan          | Velsicol: USA   |
| 17. Liza Enterprise                   | Aviacom Holland   |
| 18. Shetu Corporation                 | Sumitomo Chemical Co. Japan,<br>Union Carbide Corporation USA<br>Celamerck: West Germany,<br>Cheminova: Denmark |
| 19. Standard Finis Oil Company        | Agricides: Pakistan,  |
| 20. Pioneer Equipments and Chemicals  | Uniroyal Chemicals USA  |
| 21. Pfizer Laboratories (BD) Ltd.     | -   |
| 22. Trade International               | -   |
| 23. Tecknaf Limited                   | Uniroyal Chemicals. USA   |
| 24. Limit Agroproducts                | Hindustan, Insecticides Ltd. India,   |
| 25. Farm Chemicals Corporation        | Montidison: Italy.  |

Source : Pesticide Association of Bangladesh

TABLE 3-23 AGRO-CHEMICALS COMPANIES  
AND MARKET SHARE

| Company                     | Market Value    | Share % | No. of Pesticide registered | Staff number. |
|-----------------------------|-----------------|---------|-----------------------------|---------------|
| Burmah Eastern              | Tk. 80 million  | 21.97   | 8                           | 65            |
| BASF Ltd                    | Tk. 4 million   | 1.09    | 3                           | 3             |
| B. P. I. Ltd                | Tk. 30 million  | 9.24    | 10                          | 45            |
| BEXIMCO                     | Tk. 8 million   | 2.19    | 12                          | 25            |
| CIBA-GEIGY                  | Tk. 150 million | 41.20   | 8                           | 120           |
| DATA ENTERPRISE             | Tk. 50 million  | 11.73   | 6                           | 36            |
| ICI                         | Tk. 5 million   | 1.37    | 5                           | 7             |
| KRISHI BANIJYA<br>PROTISTAN | Tk. 9 million   | 2.47    | 2                           | 3             |
| LIZA ENTERPRISE             | Tk. 4 million   | 1.09    | 4                           | 5             |
| SHETU CORPORA-<br>TION LTD  | Tk. 24 million  | 7.59    | 9                           | 20            |

Source : Pesticide Association of Bangladesh

TABLE 3-24 AREA IRRIGATED BY DIFFERENT METHOD

(Unit: 1,000ha)

| Methods         | 1977/78  |        | 1978/79  |        | 1979/80  |        | 1980/81  |        | 1981/82  |        | 1982/83  |        | 1983/84  |        |
|-----------------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|----------|--------|
|                 | Area %   | Area % | Area %   | Area % | Area %   | Area % | Area %   | Area % | Area %   | Area % | Area %   | Area % | Area %   | Area % |
| Power pumps     | 554.5    | 38.1   | 580.5    | 39.2   | 621.5    | 39.7   | 665.8    | 40.6   | 704.1    | 40.8   | 746.5    | 40.4   | 666.7    | 34.7   |
| Tube wells      | 127.1    | 8.8    | 160.3    | 10.8   | 180.5    | 11.5   | 221.6    | 13.5   | 271.0    | 15.7   | 411.9    | 22.3   | 667.0    | 34.7   |
| Doons           | 396.8    | 27.3   | 389.1    | 26.3   | 395.4    | 25.2   | 369.0    | 22.5   | 356.5    | 20.6   | 293.8    | 15.9   | 238.3    | 12.4   |
| Swing baskets   | 62.4     | 4.3    | 69.4     | 4.7    | 73.5     | 4.7    | 83.0     | 5.1    | 85.9     | 5.0    | 84.7     | 4.6    | 83.7     | 4.4    |
| Canals          | 119.9    | 8.3    | 99.7     | 6.7    | 122.2    | 7.8    | 150.3    | 9.2    | 163.3    | 9.5    | 160.3    | 8.7    | 134.0    | 7.0    |
| Others          | 191.7    | 13.2   | 182.9    | 12.3   | 174.1    | 11.1   | 149.3    | 9.1    | 145.0    | 8.4    | 150.8    | 8.1    | 130.4    | 6.8    |
| Total           | 1,452.4  | 100    | 1,481.9  | 100    | 1,567.2  | 100    | 1,639.0  | 100    | 1,725.8  | 100    | 1,848.0  | 100    | 1,920.1  | 100    |
| Cultivated area | 8,374.4  | 17.3   | 8,418.0  | 17.6   | 8,447.7  | 18.6   | 8,562.6  | 19.1   | 8,584.5  | 20.1   | 8,610.4  | 21.5   | 8,651.3  | 22.2   |
| Cropped area    | 12,623.5 | 11.5   | 12,888.2 | 11.5   | 12,940.3 | 12.1   | 13,161.2 | 12.5   | 13,208.2 | 13.1   | 13,316.7 | 13.8   | 13,250.3 | 14.5   |

\* Percent of area irrigated by methods in all irrigated area

\*\* Percent of all irrigated area in cultivated or cropped area

Source: 1984-85 Yearbook of Agricultural Statistics of Bangladesh, Bangladesh Bureau of Statistics  
1984-85 Statistical Yearbook of Bangladesh, Bangladesh Bureau of Statistics

TABLE 3-25 AREA IRRIGATED UNDER DIFFERENT CROPS

(Unit: 1,000ha)

| Crops      | 1977/78   | 1978/79 | 1979/80   | 1980/81 | 1981/82   | 1982/83   | 1983/84   |
|------------|-----------|---------|-----------|---------|-----------|-----------|-----------|
| Rice       | 1,187.5   | 1,176.1 | 1,228.9   | 1,258.7 | 1,339.0   | 1,459.6   | 1,501.6   |
| Aman       | (84.2)    | (97.7)  | (128.6)   | (140.4) | (184.3)   | (194.3)   | (158.8)   |
| Aus        | (85.4)    | (92.4)  | (91.9)    | (119.7) | (113.0)   | (125.3)   | (145.0)   |
| Boro       | (1,017.9) | (986.0) | (1,008.4) | (998.6) | (1,041.7) | (1,140.0) | (1,197.8) |
| Wheat      | 93.8      | 142.4   | 172.5     | 194.8   | 189.6     | 193.5     | 214.5     |
| Oil seeds  | 3.2       | 3.8     | 3.2       | 4.7     | 4.2       | 4.8       | 7.2       |
| Pulses     | 0.9       | 1.0     | 1.2       | 4.6     | 2.5       | 1.6       | 1.8       |
| Vegetables | 42.0      | 49.1    | 40.0      | 43.5    | 46.9      | 50.1      | 44.4      |
| Sugarcane  | 10.2      | 9.2     | 9.7       | 9.4     | 9.8       | 6.5       | 7.9       |
| Potato     | 61.9      | 66.6    | 64.6      | 71.4    | 76.9      | 73.1      | 73.8      |
| Others     | 57.4      | 46.7    | 49.0      | 51.9    | 56.9      | 58.8      | 68.9      |
| Total      | 1,456.9   | 1,494.9 | 1,569.1   | 1,639.0 | 1,725.8   | 1,848.0   | 1,920.1   |

Source: 1984-85 Yearbook of Agricultural Statistics of Bangladesh  
Bangladesh Bureau of Statistics



TABLE 3-26 NUMBER OF PUMPS AND THEIR COVERAGE IRRIGATION AREA

|           | 1977/78  | 1978/79  | 1979/80 | 1980/81 | 1981/82   | 1982/83  | 1983/84 | 1984/85 |        |         |        |         |        |         |           |           |
|-----------|----------|----------|---------|---------|-----------|----------|---------|---------|--------|---------|--------|---------|--------|---------|-----------|-----------|
|           | Number   | Area     | Number  | Area    | Number    | Area     | Number  | Area    |        |         |        |         |        |         |           |           |
|           | (ha)     | (ha)     | (ha)    | (ha)    | (ha)      | (ha)     | (ha)    | (ha)    |        |         |        |         |        |         |           |           |
| LLP       | 36,735   | 548,337  | 35,895  | 559,870 | 37,389    | 685,783  | 35,951  | 553,297 | 37,826 | 564,321 | 42,181 | 551,366 | 43,615 | 445,147 | (48,000)  | (712,000) |
| DTW       | 7,453    | 136,980  | 9,329   | 204,106 | 9,895     | 279,070  | 10,131  | 259,456 | 11,491 | 323,026 | 13,794 | 404,669 | 15,519 | 376,564 | (17,000)  | (412,000) |
| STW       | (12,613) | (40,470) | -       | -       | (23,466)  | (89,034) | 20,931  | 99,233  | 43,133 | 202,127 | 62,253 | 298,721 | 67,803 | 303,513 | (154,000) | (779,000) |
| Hand pump | (60,000) | (10,100) | -       | -       | (110,000) | (13,800) | -       | -       | -      | -       | -      | -       | -      | -       | (300,000) | (36,000)  |

Sources: 1984-85 Yearbook of Agricultural Statistics of Bangladesh, Bangladesh Bureau of Statistics  
 Number in parentheses are extracted from The Third Five Year Plan 1985-90, Planning Commission

FIG. 3-7 TREND OF AREA IRRIGATED METHOD

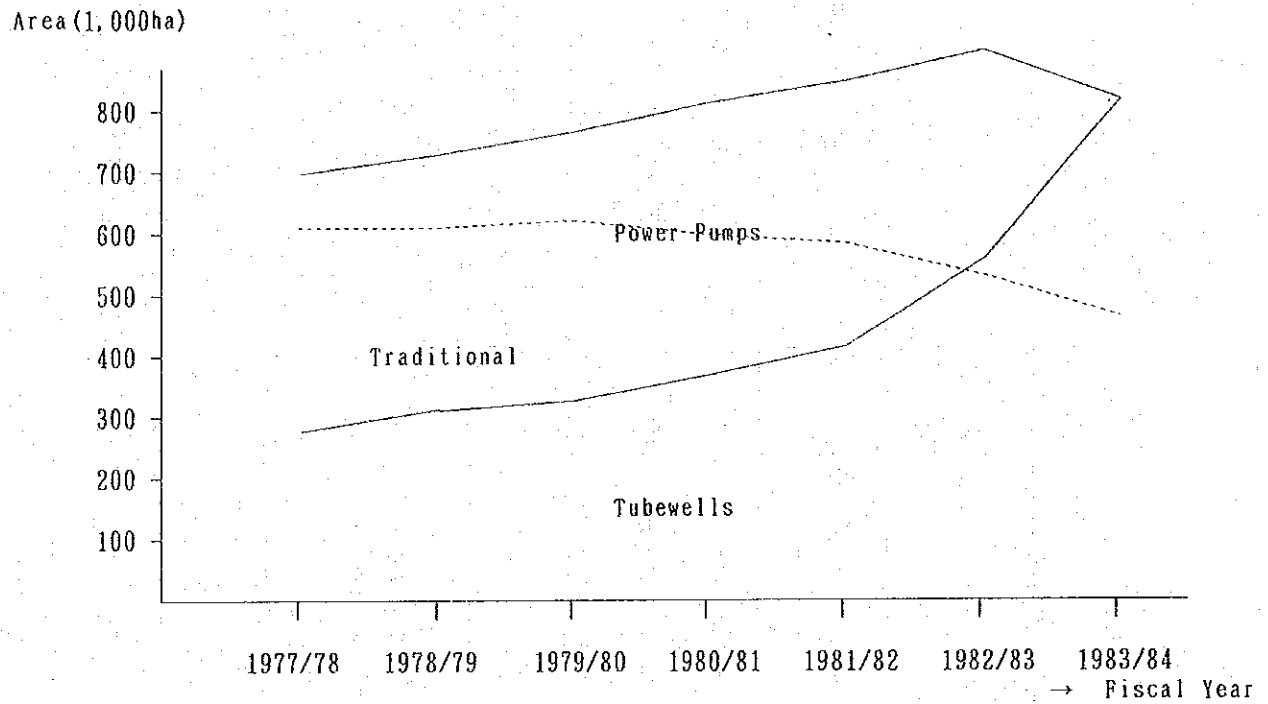
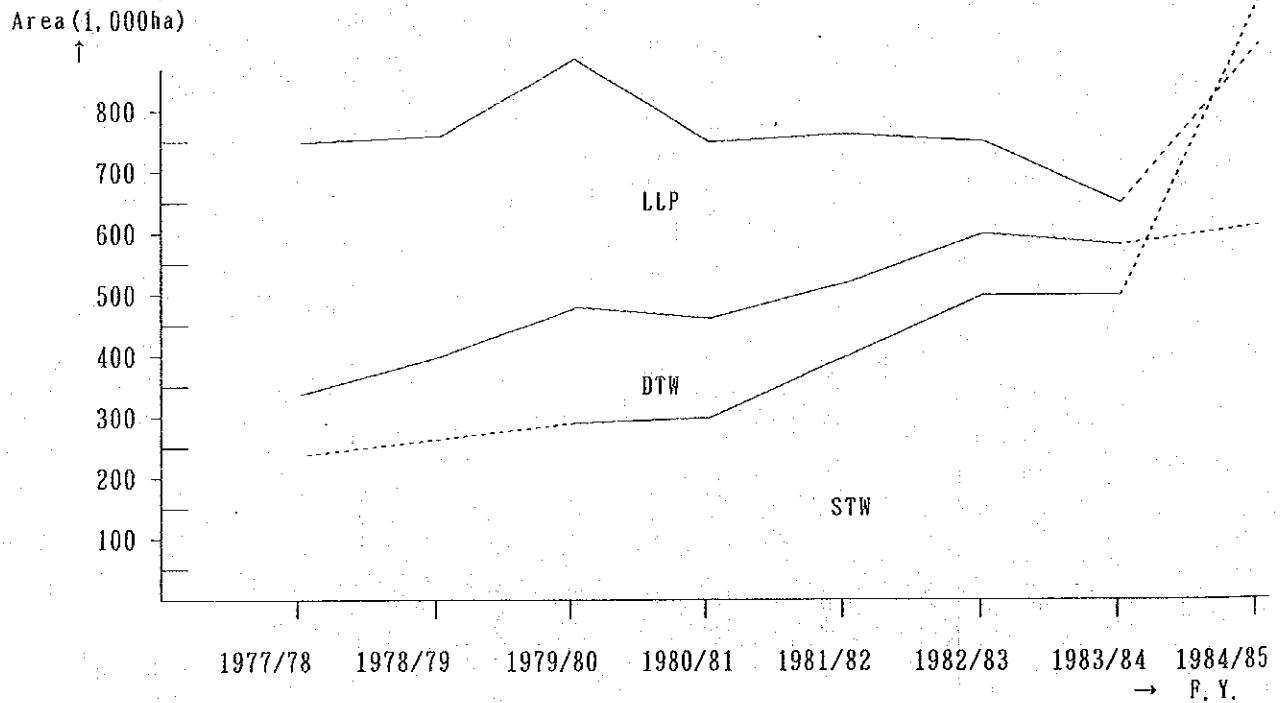


FIG. 3-8 TREND OF AREA IRRIGATED BY DIFFERENT TYPES OF PUMPS



\* Solid line Yearbook of Agricultural Statistics  
 Broken line The Third Five Year Plan

TABLE 3-27 GROWTH RATES OF IRRIGATION AND FLOOD-PREVENTING OPERATIONS OF THE FIRST AND SECOND FIVE YEAR PLAN

| Irrigation method<br>Drainage/flood<br>Prevention | First Five Year Plan   |                    |                        |   | Second Five Year Plan  |                    |                        |   |         |      |
|---|------------------------|--------------------|------------------------|---|------------------------|--------------------|------------------------|---|---------|------|
|   | Achievement in 1972/73 |                    | Achievement in 1977/78 |   | Achievement in 1979/80 |                    | Achievement in 1984/85 |   |         |      |
|   | Quantity<br>(1,000 ha) | Area<br>(1,000 ha) | Quantity<br>(1,000 ha) | Area<br>(1,000 ha)                        | Quantity<br>(1,000 ha) | Area<br>(1,000 ha) | Quantity<br>(1,000 ha) | Area<br>(1,000 ha)                        |         |      |
|   |                        |                    |                        | Annual<br>Growth Rate<br>(Area<br>ratio%) |                        |                    |                        | Annual<br>Growth Rate<br>(Area<br>ratio%) |         |      |
| I) Irrigation<br>Facilities                       |                        |                    |                        |   |                        |                    |                        |   |         |      |
| 1. Surface Water<br>Irrigation                    |                        |                    |                        |   |                        |                    |                        |   |         |      |
| Gravity Irrigation                                | -                      | 49.4               | -                      | 64.8                                      | 5.2                    | -                  | 83.8                   | -   | 192.2   | 18.1 |
| Low-lifting Pumps                                 | 30,000                 | 424.9              | 36,730                 | 548.4                                     | 5.2                    | 38,600             | 582.8                  | 48,000                                    | 712.3   | 4.1  |
| Traditional Irrigation                            | -                      | 404.7              | -                      | 364.2                                     | -2.1                   | -                  | 404.7                  | -   | 344.0   | -3.2 |
| Sob-total   | -                      | 879.0              | -                      | 977.4                                     | 2.1                    | -                  | 1,071.2                | -   | 1,248.5 | 2.1  |
| 2. Ground Water<br>Irrigation                     |                        |                    |                        |   |                        |                    |                        |   |         |      |
| DTW   | 2,900                  | 50.6               | 7,453                  | 135.6                                     | 21.8                   | 9,795              | 268.0                  | 17,000                                    | 412.8   | 11.6 |
| STW   | 2,000                  | 6.5                | 12,613                 | 90.5                                      | 44.3                   | 23,468             | 89.0                   | 154,000                                   | 779.0   | 54.3 |
| Well Driven by<br>Manual Pump                     | -                      | -                  | 60,000                 | 10.1                                      | -                      | 10,000             | 13.8                   | 300,000                                   | 36.4    | 21.5 |
| Sob-total   | -                      | 57.1               | -                      | 186.2                                     | 26.7                   | -                  | 340.8                  | -   | 1,228.3 | 29.2 |
| Total   | -                      | 936.1              | -                      | 1,163.5                                   | 4.4                    | -                  | 1,412.0                | -   | 2,476.8 | 11.9 |
| II) Flood Prevention,<br>Drainage                 | -                      | 1,214.1            | -                      | 1,821.2                                   | 8.4                    | -                  | 1,938.5                | -   | 2,590.1 | 6.0  |

Source: The Third Five Year Plan 1985-90, Planning Commission

TABLE 3-28 GOALS TO BE ACHIEVED IN THE THIRD FIVE YEAR PLAN

| Irrigation Method               | Achievement in 1984/85 |                | Goals for 1989/90 |                | Annual Growth Rate (%) |
|---------------------------------|------------------------|----------------|-------------------|----------------|------------------------|
|                                 | Quantity               | Area (1,000ha) | Quantity          | Area (1,000ha) |                        |
| I) Irrigation Facilities        |                        |                |                   |                |                        |
| 1. Surface Water Irrigation     |                        |                |                   |                |                        |
| Gravity Irrigation              | -                      | 192.2          | -                 | 604.6          | 25.8                   |
| Low-lifting Pump                | 48,000                 | 712.3          | 60,000            | 849.9          | 2.6                    |
| (a) 1-cusec                     | (20,000)               | (202.4)        | (30,000)          | (303.5)        | 8.4                    |
| (b) 2-cusec                     | (28,000)               | (509.9)        | (30,000)          | (546.4)        | 1.4                    |
| Traditional Irrigation          | -                      | 344.0          | -                 | 323.8          | -1.2                   |
| * S P U P                       | -                      | -              | -                 | 139.6          | -                      |
| Sub-total                       | -                      | 1,248.5        | -                 | 1,917.9        | 8.9                    |
| 2. Ground Water Irrigation      |                        |                |                   |                |                        |
| S T W                           | 154,000                | 779.0          | 200,000           | 1,011.8        | 5.4                    |
| D T W                           | 17,000                 | 412.8          | 30,000            | 728.5          | 12.0                   |
| Well driven by Manual Pump      | 300,000                | 36.4           | 450,000           | 54.6           | 8.4                    |
| Sub-total                       | -                      | 1,228.2        | -                 | 1,794.9        | 7.9                    |
| 3. ** C A D                     | -                      | -              | -                 | 190.2          | -                      |
| Total                           | -                      | 2,476.7        | -                 | 3,903.0        | 9.5                    |
| II) Flood Prevention · Drainage | -                      | 2,590.1        | -                 | 3,340.4        | 5.2                    |

\* S P U P : Small Projects by Upa-Zila Parisad

\*\* C A D : Command Area Development

Source: The Third Five Year Plan 1985-90, Planning Commission

TABLE 3-29 NUMBER OF TRACTORS IN 1970

|   | Quantity (Nos)      |
|---|---------------------|
| Privately owned Tractors                            | 1,657               |
| Government owned Tractors                           |                     |
| 1) Bangladesh Agricultural Corporation              | 257                 |
| 2) Bangladesh Industrial Development Corporation    | 111                 |
| 3) Bangladesh Water and Power Development Authority | 14                  |
| 4) Directorate of Agriculture                       | 16                  |
| 5) Comilla Academy                                  | 17                  |
|   | <u>Subtotal 415</u> |
|   | Grand total 2,072   |

Classification of Tractors by Horse power

|                   |                    |
|-------------------|--------------------|
| 1) Less than 25HP | 8                  |
| 2) 26 to 35 HP    | 144                |
| 3) 30 to 45 HP    | 1,108              |
| 4) 46 to 55 HP    | 696                |
| 5) 56 to 66 HP    | 40                 |
| 6) Over 66 HP     | 76                 |
|                   | <u>Total 2,072</u> |

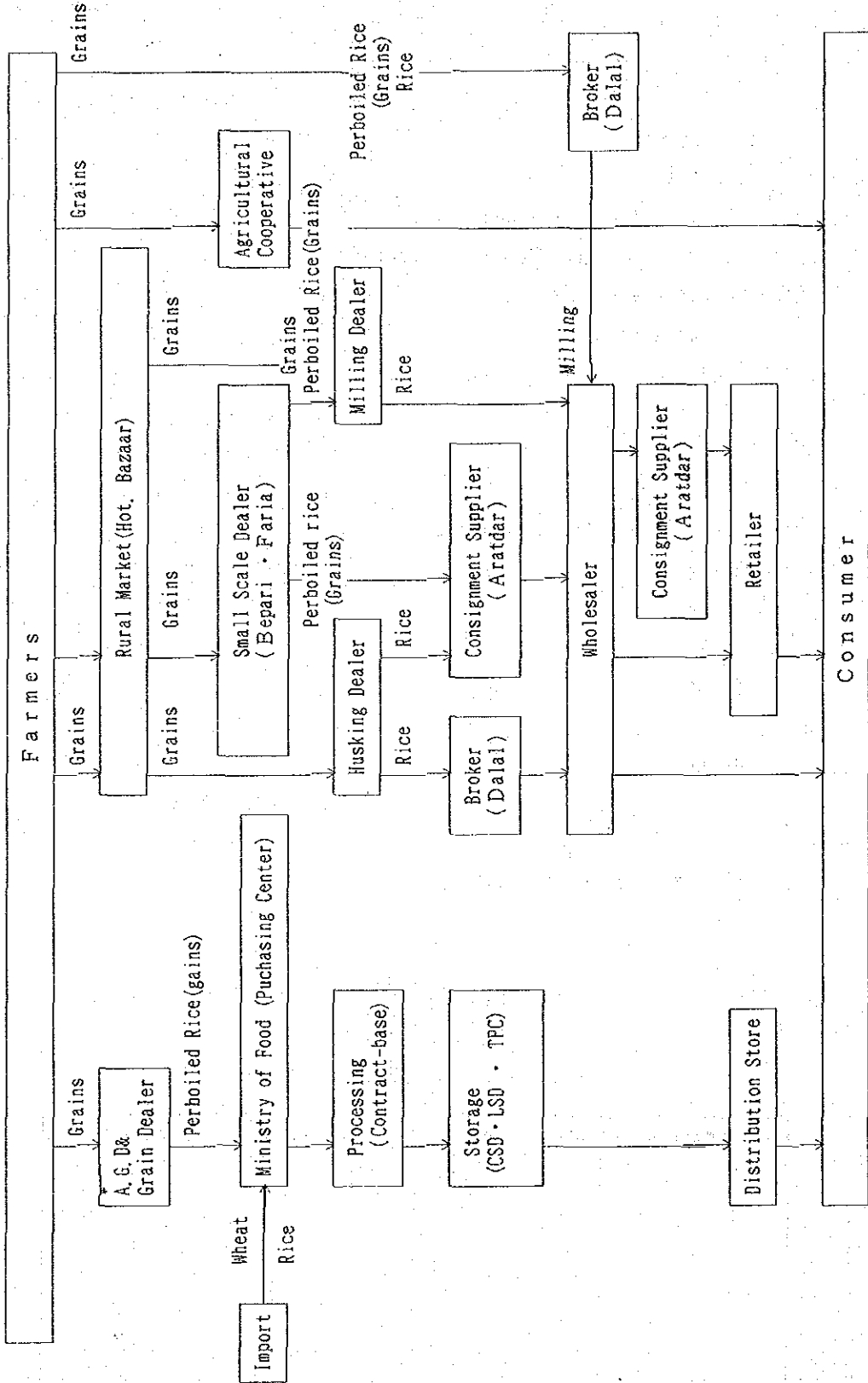
Source: Bangladesh Agriculture in Statistics

Nov. 1973

TABLE 3-30 NUMBER OF TRACTORS AND TILLERS IMPORTED BY GOVERNMENT AGENCIES

| F. Y.   | Number of tractors (Nos) |     |      |       | Number of tillers (Nos) |     |      |       |
|---------|--------------------------|-----|------|-------|-------------------------|-----|------|-------|
|         | BADC                     | BKB | BWDB | total | BADC                    | BKB | BWDB | total |
| 1973-74 | 24                       | —   | —    | 24    | 300                     | —   | —    | 300   |
| 1973-74 | —                        | —   | —    | —     | —                       | —   | —    | —     |
| 1973-74 | —                        | —   | —    | —     | —                       | —   | —    | —     |
| 1973-74 | —                        | 30  | —    | 30    | —                       | 310 | —    | 310   |
| 1973-74 | —                        | —   | —    | —     | —                       | —   | —    | —     |

FIG. 3-9 CIRCULATION DIAGRAM OF PADDY RICE



\* A. G. D. Approved A. G. D. is an Approved Grains Dealer  
 : Directorate of Agricultural Marketing (Bazlur Rahman): Rural Markets  
 Serving Small Farmers in Bangladesh, 1978.

TABLE 3-31 STANDARD SPECIFICATIONS FOR DETERMINING QUALITY OF MILLED RICE

| Item No. | Grading Factors             | Grade Requirements |             |                        |                 |
|----------|-----------------------------|--------------------|-------------|------------------------|-----------------|
|          |                             | Super              | Grade-I     | Grade-II               | Grade-III       |
| 1        | Moisture Content (max)      | 14                 | 14          | 14                     | 14              |
| 2        | Head Rice (min)             | 95                 | 90          | 85                     | 80              |
| 3        | Big Broken (max)            | 4                  | 8           | 12                     | 16              |
| 4        | Broken (min)                | 1                  | 2           | 3                      | 4               |
| 5        | Small Broken (min)          |                    |             |                        |                 |
| 6        | Red Streaked Kernels (max)  | 0.25               | 0.5         | 0.75                   | 1               |
| 7        | Yellow and Damaged (max)    | 0.5                | 1           | 2                      | 3               |
| 8        | Contrasting Varieties (max) | 2                  | 5           | 10                     | 15              |
| 9        | Paddy (Grains per kg.)      | —                  | 1           | 2                      | 3               |
| 10       | Foreign Matter (max)        | 0.25               | 0.5         | 1                      | 1.5             |
| 11       | Degree of Milling           | Extra Well Milled  | Well Milled | reasonably Well Milled | Ordinary Milled |

STANDARD SPECIFICATIONS FOR DETERMINING QUALITY OF PADDY RICE

| GRADING FACTOR           | GRADE I | GRADE II | GRADE III | GRADE IV | GRADE V |
|--------------------------|---------|----------|-----------|----------|---------|
| Purity (min %)           | 98      | 97       | 96        | 95       | 94      |
| Foreign Matter (max %)   | 2       | 3        | 4         | 4.75     | 5.5     |
| Weed Seed (max %)        | None    | None     | Trace     | 0.25     | 0.5     |
| Cracked Kernels          | 3       | 4        | 5         | 6        | 7       |
| Other Varieties          | 3       | 5        | 7         | 8        | 10      |
| Immature Kernels         | None    | 2        | 2.5       | 3        | 3       |
| Damaged Kernels          | 1       | 2        | 2.5       | 3        | 3       |
| Permented Kernels        | None    | 2        | 2.5       | 3        | 3       |
| Moisture Content (max %) | 14      | 14       | 14        | 14       | 14      |

TABLE 3-32 STANDARD SPECIFICATIONS FOR DETERMINING QUALITY OF PERBOILED RICE

| Item No. | Grading Factors               | Grade Requirements |             |                        |                 |
|----------|-------------------------------|--------------------|-------------|------------------------|-----------------|
|          |                               | Super              | Grade-I     | Grade-II               | Grade-III       |
| 1        | Moisture Content (max)        | 14                 | 14          | 14                     | 14              |
| 2        | Head Rice (min)               | 80                 | 75          | 70                     | 65              |
| 3        | Big Brokens (max)             | 15                 | 15          | 15                     | 15              |
| 4        | Brokens (min)                 | 5                  | 10          | 15                     | 20              |
| 5        | Small Brokens (min)           |                    |             |                        |                 |
| 6        | Chalky/Immature Kernels (max) | 2                  | 4           | 6                      | 8               |
| 7        | Damaged Grain (max)           | 0.5                | 1           | 2                      | 3               |
| 8        | Contrasting Varieties (max)   | 2                  | 5           | 10                     | 15              |
| 9        | Paddy (Grains per kg.)        | —                  | 1           | 2                      | 3               |
| 10       | Foreign Matter (max)          | 0.1                | 0.25        | 0.5                    | 1               |
| 11       | Degree of Milling             | Extra Well Milled  | Well Milled | reasonably Well Milled | Ordinary Milled |



TABLE 4-1 AVERAGE CROP RESPONSE RATIOS TO FERTILIZER APPLICATIONS

(Unit : kg Foodgrain/kg Fertilizer)

| Crop       | Fertilizer |     |     |              |
|------------|------------|-----|-----|--------------|
|            | Urea       | TSP | MP  | Zinc Sulfate |
| Aman Paddy | 5.5        | 4.6 | 3.0 | 19.1         |
| Aus Paddy  | 5.5        | 3.2 | 3.0 | 10.8         |
| Boro Paddy | 6.9        | 5.1 | 3.0 | 16.6         |
| Wheat      | 6.9        | 5.5 | 4.8 | -            |

Source: Recommendation of the President to the Board of Directors and Appraisal of a Proposed Loan to the People's Republic of Bangladesh for a Fourth Crop Intensification Program, Appendix

TABLE 4-2 FERTILIZER'S EFFECT UNDER THE PROGRAM

|           | Contributed Quantity<br>(MT) | CIF Price<br>(\$/MT) | Domestic Retail Price<br>(Taka/MT) | Increased Production (MT) |           | Gross Income<br>(1,000Taka) | CIF Price<br>(1,000Taka) | Total Cost |              | B/C Ratio |
|-----------|------------------------------|----------------------|------------------------------------|---------------------------|-----------|-----------------------------|--------------------------|------------|--------------|-----------|
|           |                              |                      |                                    | Aus                       | Aman Boro |                             |                          | Price      | Retail Price |           |
| 1981 Urea | 9,859                        | 252.80               | 3,538                              | 12,524                    | 23,969    | 22,246                      | 62,309                   | 34,881     | 3.27         | 5.84      |
| TSP       | 8,805                        | 283.03               | 3,082                              | 6,509                     | 17,903    | 14,683                      | 62,302                   | 27,137     | 2.20         | 5.05      |
| Average   |                              |                      |                                    |                           |           | 340,586                     | 124,611                  | 62,018     | 2.73         | 5.49      |
| 1984 Urea | 23,500                       | 248.85               | 4,363                              | 24,816                    | 56,744    | 59,823                      | 146,199                  | 102,531    | 4.34         | 6.19      |

Exchange Rate : \$ = Tk25

TABLE 4-3 COMPARISON OF FERTILIZER PRICE  
BY PROCUREMENT SOURCE (1984/85)  
(Taka/MT)

|                         | CIF Price | Distribution<br>Cost | a/ BADC<br>Sale Price | Subsidy  | Rate of<br>b/<br>Subsidy |
|-------------------------|-----------|----------------------|-----------------------|----------|--------------------------|
| Urea                    |           |                      |                       |          |                          |
| Domestic Product(1)     | 3,039.00  | 750                  | 4,517.32              | -728.32  | -32                      |
| Domestic Product(2)     | 4,054.65  | 750                  | 4,517.32              | 287.33   | 13                       |
| Japan                   | 6,587.06  | 750                  | 4,517.32              | 2,819.74 | 125                      |
| USAID                   | 5,801.50  | 750                  | 4,517.32              | 2,034.18 | 90                       |
| USAID                   | 7,186.41  | 750                  | 4,517.32              | 3,419.09 | 152                      |
| Netherlands             | 5,633.40  | 750                  | 4,517.32              | 1,866.08 | 83                       |
| Norway                  | 4,853.12  | 750                  | 4,517.32              | 1,085.80 | 48                       |
| Average                 | 6,022.45  | 750                  | 4,517.32              | 2,255.13 | 100                      |
| T S P                   |           |                      |                       |          |                          |
| Domestic Product        | 5,735.00  | 750                  | 4,200.73              | 2,284.27 | 144                      |
| Netherlands             | 4,773.85  | 750                  | 4,200.73              | 1,323.12 | 83                       |
| Rumania                 | 4,856.16  | 750                  | 4,200.73              | 1,405.43 | 88                       |
| A D B ( C I P - I I )   | 4,617.07  | 750                  | 4,200.73              | 1,166.34 | 73                       |
| E E C                   | 5,853.82  | 750                  | 4,200.73              | 2,403.09 | 151                      |
| A D B ( C I P - I I I ) | 4,555.18  | 750                  | 4,200.73              | 1,104.45 | 69                       |
| Average                 | 5,041.97  | 750                  | 4,200.73              | 1,591.24 | 100                      |

a/ Estimation

b/ Average Subsidy=100%

TABLE 4-4 RECORD OF AGRO-CHEMICALS DONATION  
UNDER THE PROGRAM

| F. Y. | Agro-Chemical         | Quantity<br>(ton) | Total Cost<br>(¥1,000,000) | Recipient Agency           |
|-------|-----------------------|-------------------|----------------------------|----------------------------|
| 1983  | Phenthoate 92% ULVC   | 10                |                            | Plant Protection Wing, MOA |
|       | Phenthoate 50% EC     | 10                |                            | "                          |
|       | Diazinon 60% EC       | 10                |                            | "                          |
|       | Dichlorovos 100% EC   | 19,9091           |                            | "                          |
|       | Penitrothion 98% ULVC | 30                |                            | "                          |
|       | Penitrothion 50% EC   | 19,921            |                            | "                          |
|       | (Sub-total)           | 99,8301           | 130.0                      | "                          |
| 1984  | Penitrothion 50% EC   | 35                |                            | PPW, MOA                   |
|       | MIPC 75% WP           | 5                 |                            | "                          |
|       | Phenthoate 92% ULVC   | 25                |                            | "                          |
|       | Diazinon 90% EC       | 15                |                            | "                          |
|       | Dichlorovos 100% EC   | 20                |                            | "                          |
|       | Penitrothion 50% EC   | 10                |                            | Ministry of Food           |
|       | (Sub-total)           | 110               | 144.265                    |                            |

TABLE 4-5 RECORD OF AGRO-CHEMICAL USE  
DONATED UNDER THE PROGRAM MOA, PPW  
For-1985/86. (AERIAL SPRAYING)

| Area District  | Diazinon<br>60% EC | Elsan<br>50%EC | DDVP<br>100%EC | Sumithion<br>50%EC. | Elsan<br>92 ULV. | Sumithion<br>98 ULV. |
|----------------|--------------------|----------------|----------------|---------------------|------------------|----------------------|
| 1. Jessore     |                    |                |                |                     |                  | } 26. M. Tons.       |
| 2. Rajshahi    |                    |                |                |                     |                  |                      |
| 3. Barisal     |                    |                |                |                     |                  |                      |
| 4. Kishoregonj |                    |                |                |                     |                  |                      |
| 5. Dhaka       |                    |                |                |                     |                  |                      |
| 6. Narayanganj |                    |                |                |                     |                  |                      |
| 7. Manikgonj   |                    |                |                |                     |                  |                      |
| 8. Munsbigon   |                    |                |                |                     |                  |                      |
| 9. Chandpur    |                    |                |                |                     |                  |                      |
| 10. Comilla    |                    |                |                |                     |                  |                      |
| 11. B. Batia   |                    |                |                |                     |                  |                      |
| Total          |                    |                |                |                     |                  | 26. M. Tons.         |

(GROUNDS SPRAY)

|                      |     |     |   |     |
|----------------------|-----|-----|---|-----|
| 1. Dhaka             | 120 | 159 |   | 300 |
| 2. Narayanganj       | 102 | 106 |   | 400 |
| 3. Munishigong       | -   | 159 |   | 200 |
| 4. Manikgonj         | 102 | 195 |   | 400 |
| 5. Gazipur           | 153 | 159 |   | 200 |
| 6. Narsingdi         | 102 | 265 |   | 200 |
| 7. Tangail           | 102 | 265 |   | 200 |
| 8. Mymensingh        | 102 | 159 |   | 200 |
| 9. Jamalpur          | -   | 159 |   | 200 |
| 10. Sherpur          | 102 | 212 |   | -   |
| 11. Kishoregonj      | 102 | 106 |   | 200 |
| 12. Netrokona        | 102 | 159 |   | 200 |
| 13. Comilla          | 153 | 530 |   | 750 |
| 14. Chandpur         | 254 | -   |   | 300 |
| 15. Brammanbaria     | 102 | 106 |   | 300 |
| 16. Sylhet           | 102 | 106 |   | 200 |
| 17. Habigonj         | -   | 159 |   | 200 |
| 18. Moulvibazar      | -   | 159 |   | 200 |
| 19. Sunamgonj        | -   | 106 |   | 250 |
| 20. Chittagon        | 102 | 159 |   | 200 |
| 21. Cox's Bazar      | 102 | -   | - | 200 |
| 22. Noakhali         | 153 | 159 | - | 550 |
| 23. Feni             | 102 | -   | - | 200 |
| 24. Lakhnipur        | -   | 159 | - | 200 |
| 25. Ctg. Hill Tracts | 102 | -   | - | 200 |
| 26. Khagrachari      | -   | 106 | - | 200 |
| 27. Bangarban        | -   | 106 | - | 100 |
| 28. Rajshahi         | -   | 318 | - | 300 |
| 29. Nowabgonj        | 102 | -   | - | 200 |
| 30. Naogaon          | 102 | -   | - | 200 |
| 31. Natore           | 102 | -   | - | 200 |
| 32. Pabna            | 153 | 254 | - | 300 |
| 33. Serajgonj        | -   | 199 | - | 200 |
| 34. Bogra            | 102 | 212 | - | -   |

(Continued)

| Area<br>District | Diazinon<br>60% EC | Elsan<br>50%EC | DDVP<br>100%EC | Sumithion<br>50%EC | Elsan<br>92 ULV | Sumithion<br>98 ULV |
|------------------|--------------------|----------------|----------------|--------------------|-----------------|---------------------|
| 35. Joypurhat    | 102                | 159            | -              | -                  |                 |                     |
| 36. Rangpur      | 102                | -              | -              | 100                |                 |                     |
| 37. Gaibandha    | 102                | -              | -              | 100                |                 |                     |
| 42. Thakurgaon   | 102                | -              | -              | 100                |                 |                     |
| 43. Panchagarh   | 102                | -              | -              | 100                |                 |                     |
| 44. Jessore      | 153                | 265            | -              | 500                |                 |                     |
| 45. Bhenaidah    | 153                | 318            | -              | 550                |                 |                     |
| 46. Magura       | 102                | 281            | -              | 550                |                 |                     |
| 47. Narail       | 153                | -              | -              | 200                |                 |                     |
| 48. Khulna       | 153                | -              | -              | 200                |                 |                     |
| 49. Baherhat     | 153                | -              | -              | 200                |                 |                     |
| 50. Satkhira     | 153                | -              | -              | 200                |                 |                     |
| 51. Kushtia      | 254                | 212            | -              | 350                |                 |                     |
| 52. Chuadanga    | 254                | -              | -              | 250                |                 |                     |
| 53. Meharpur     | 153                | -              | -              | 200                |                 |                     |
| 54. Barisal      | 153                | 212            | -              | 300                |                 |                     |
| 55. Jhalokathi   | -                  | 212            | -              | 200                |                 |                     |
| 56. Perojpur     | 153                | -              | -              | 200                |                 |                     |
| 57. Faridpur     | 304                | -              | -              | 300                |                 |                     |
| 58. Rajbari      | -                  | 212            | -              | 200                |                 |                     |
| 59. Madaripur    | 153                | -              | -              | 200                |                 |                     |
| 60. Gopalganj    | -                  | 242            | -              | 200                |                 |                     |
| 61. Shariatpur   | -                  | 106            | -              | 250                |                 |                     |
| 62. Barguna      | 254                | 212            | -              | 400                |                 |                     |
| 63. Patuakhali   | 254                | 212            | -              | 500                |                 |                     |
| 64. Bhola        | 254                | -              | -              | 250                |                 |                     |
| TOTAL            | <u>7,177Kg</u>     | <u>7,579</u>   | <u>0</u>       | <u>15,000</u>      | <u>0</u>        | <u>26,000</u>       |
| Supply           | 10,000             | 10,000         | 19,901         | 19,921             | 10,000          | 30,000              |

Source: Ministry of Agriculture, Plant Protection Wing

TABLE 4-6 BENEFITTED AREA AND COST PER UNIT AREA  
BY AGRO-CHEMICALS GRANTED

| Pesticide               | Quantity Granted<br>(Kg) | Dosage <sup>1</sup><br>(Kg/ha) | Benefitted<br>Area (ha) | Unit Price <sup>3</sup><br>(¥/kg) (TK/kg) | Unit Cost <sup>3</sup><br>(¥/ha) (TK/ha) | Unit Price of<br>Domestic<br>Market (TK /Kg) |
|-------------------------|--------------------------|--------------------------------|-------------------------|---|--|--|
| 1983/84                 |                          |                                |                         |   |  |  |
| 1. Diazinon 60 EC       | 10,000                   | 1.68                           | 5,952                   | 1,300 (253)                               | 2,184 (425)                              | 300 <sup>4</sup>                             |
| 2. Phenthoate 50 EC     | 10,000                   | 2.40 <sup>2</sup>              | 4,167                   | 1,250 (243)                               | 3,000 (584)                              | 250  |
| 3. Phenthoate 92 ULVC   | 10,000                   | 1.30 <sup>2</sup>              | 7,692                   | 1,450 (282)                               | 1,885 (367)                              | -  |
| 4. DDVP 100 EC          | 10,000                   | 0.56                           | 17,857                  | 1,100 (214)                               | 616 (120)                                | 273  |
| 5. Fenitrothion 50 EC   | 20,000                   | 1.12                           | 17,857                  | 1,265 (246)                               | 1,417 (276)                              | 250  |
| 6. Fenitrothion 98 ULVC | 30,000                   | 0.57                           | 52,632                  | 1,430 (278)                               | 815 (159)                                | -  |
| Total                   |                          |                                | 106,157                 |   |  |  |
| 1984/85                 |                          |                                |                         |   |  |  |
| 1. Diazinon 90 ULVC     | 15,000                   | 1.12                           | 13,393                  | 1,500 (292)                               | 1,680 (327)                              | 379 <sup>5</sup>                             |
| 2. Phenthoate 92 ULVC   | 25,000                   | 1.30 <sup>2</sup>              | 19,231                  | 1,450 (282)                               | 1,885 (367)                              | -  |
| 3. Fenitrothion 50 EC   | 35,000                   | 1.12                           | 31,250                  | 1,265 (246)                               | 1,417 (276)                              | 280  |
| 4. DDVP 100 EC          | 20,000                   | 0.56                           | 35,714                  | 1,100 (218)                               | 616 (120)                                | 344  |
| 5. MIPC 75 WP           | 5,000                    | 2.13                           | 2,347                   | 1,318 (257)                               | 2,807 (546)                              | -  |
| Total                   |                          |                                | 101,935                 |   |  |  |

- Note
- 1 : Amount of pesticide.
  - 2 : Dosage recommended in Japan.
  - 3 : Conversion rate is ¥5.14/TK basing on ¥170/\$ and TK 33.1/\$.
  - 4 : Pesticide's unit prices of domestic market in Feb. 1985.
  - 5 : Pesticide's unit prices of domestic market in Feb. 1986.

TABLE 4-7 ACHIEVEMENTS REGARDING AGRICULTURAL MACHINERY FOR THE FOOD AID PROGRAM

| F. Y. | Item                         | Quantity | Annual Sub-total<br>( 1,000yen) |
|-------|------------------------------|----------|---------------------------------|
| 1978. | D T W 20HP / 1,800RPM        | 50       |                                 |
|       | P I P E 6 " ~ 14 "           | 1 lot    | 348,259                         |
| 1979  | S T W 6 ~ 7 HP / 2,200RPM    | 10,261   |                                 |
|       | L L P 18HP / 2,200RPM        | 1,350    | 1,348,953                       |
| 1980  | S T W 6 HP / 2,200RPM        | 12,807   | 1,500,000                       |
| 1981  | S T W 6 HP / 2,200RPM        | 9,781    |                                 |
|       | L L P 9 HP / 2,200RPM        | 2,100    | 1,500,000                       |
| 1982  | S T W 6 HP / 2,200RPM        | 11,651   |                                 |
|       | S T W 5 ~ 6.3 HP / 1,500RPM  | 15,072   | 3,199,977                       |
| 1983  | S T W 5.3 ~ 6.3HP / 1,500RPM | 24,800   | 3,169,917                       |
| 1984  | D T W 22.5HP / 2,250RPM      | 300      |                                 |
|       | D T W 36HP / 2,250RPM        | 1,200    |                                 |
|       | Spare Pats for Engine        | 1 lot    |                                 |
|       | Spare Part for Truck         | 1 lot    | 1,129,693                       |

D T W : Engine for DTW (Price is included Spare Parts)  
 S T W : Engine for STW ( " )  
 L L P : Engine for LLP ( " )

Source: Extracted from Ministry of Foreign Affairs documents.



TABLE 4-8 NUMBER OF ENGINES IMPORTED FOR IRRIGATION PUMPS

(Unit: Number)

| F. Y.   | DTW   |     |            | STW    |       |            | LLP   |     |            |
|---------|-------|-----|------------|--------|-------|------------|-------|-----|------------|
|         | BADC  | BKB | BWDB Total | BADC   | BKB   | BWDB Total | BADC  | BKB | BWDB Total |
| 1977/78 | 1,271 | -   | 1,271      | -      | 2,000 | 2,000      | 1,172 | -   | 1,172      |
| 1978/79 | 356   | -   | 356        | 2,200  | 2,358 | 4,558      | -     | -   | -          |
| 1979/80 | N.A   | -   | N.A        | 27,336 | 3,500 | 30,836     | N.A   | -   | 73         |
| 1980/81 | -     | -   | -          | 12,807 | 3,500 | 16,307     | 4,455 | -   | 555        |
| 1981/82 | -     | -   | -          | 25,128 | 2,000 | 27,128     | 4,500 | -   | 240        |
| 1982/83 | N.A   | -   | N.A        | 26,723 | 9,000 | 35,723     | -     | -   | -          |
| 1983/84 | -     | -   | -          | 24,800 | -     | 24,800     | -     | -   | -          |

BADC: Bangladesh Agricultural Development Corporation

BKB: Bangladesh Krishi Bank

BWDB: Bangladesh Water Development Board

N.A: Data not available

Source: 1984-85 Yearbook of Agricultural Statistics of Bangladesh,  
Bangladesh Bureau of Statistics

TABLE 4-9 NUMBER OF LIP'S, ENGINES, AND MOTORS  
IN STOCK OF BADC (Date Obtained on June 30, 1985)

I. Brand New

|                      | 1 cusec<br>(28.3 lit/sec) | 2 cusec<br>(56.6 lit/sec) | 3 cusec<br>(84.9 lit/sec) | 5 cusec<br>(141.5 lit/sec) | Sub-total |
|----------------------|---------------------------|---------------------------|---------------------------|----------------------------|-----------|
| Japanese made Engine | 2,052                     | 4,963                     | -                         | -                          | 7,015     |
| Foreign made Engine  | 2,162                     | 88                        | 8                         | -                          | 2,258     |
| Sub-total            | 4,214                     | 5,051                     | 8                         | -                          | 9,273     |
| Motor-driven Pump    | 35                        | 403                       | -                         | 55                         | 493       |
| Total                | 4,249                     | 5,454                     | 8                         | 55                         | 9,766     |

II. Used Articles (Rental Pumps repaired and equipped)

|                      | 1 cusec | 2 cusec | 3 cusec | 5 cusec | Sub-total |
|----------------------|---------|---------|---------|---------|-----------|
| Japanese made Engine | 273     | 512     | -       | -       | 785       |
| Foreign made Engine  | 1,069   | 8,208   | 20      | -       | 9,297     |
| Sub-total            | 1,342   | 8,720   | 20      | -       | 10,082    |
| Motor-driven Pump    | 42      | 4,435   | 19      | 127     | 4,623     |
| Total                | 1,384   | 13,155  | 39      | 127     | 14,705    |

※ Engine powers required for 1 and 2 cusec pump are about 9 and 18 HP, respectively.

Source : Bangladesh Agricultural Development Corporation

TABLE 4-10 STW AND ENGINES IN STOCK OF BADC

(June 30, 1985)

| Item  | Quantity |
|---|----------|
| Japanese made 6 HP/2,200 RPM Pump mounted Engine          | 20,596   |
| Foreign made 2,200 RPM Pump mounted Engine                | 3,708    |
| Sob-total   | 24,304   |
| Japanese made 5~6 HP/1,500 Pump mounted Engine            | 5,436    |
| Foreign made 1,500 RPM Pump mounted Engine                | 347      |
| Sob-total   | 5,783    |
| Pumps mounted with Single Phase Motor                     | 725      |
| Pumps mounted with Threephase Motor                       | 1,093    |
| Sob-total   | 1,818    |
| Japanese made 5.3~6 HP/1,500 RPM Engine (New Procurement) | 24,800   |
| Japanese made 6 HP/2,200 RPM Engine                       | 1,547    |
| Motor   | 211      |
| Engine-mounted pumps that cannot put into operation       | 1,533    |
| Sob-total   | 28,091   |
| Grand total   | 59,996   |

Source : Bangladesh Agricultural Development Corporation domestic document

TABLE 4-11 ANALYSIS OF DIESEL ENGINE OIL  
(RESULTS)

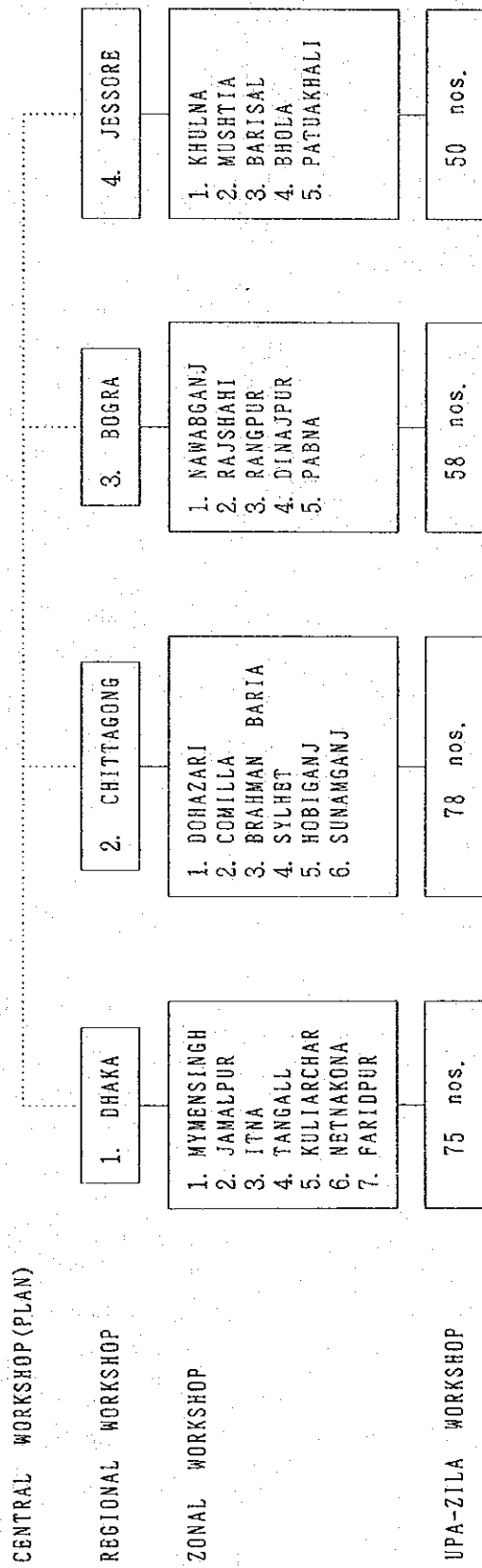
Sample name MEGHNA (Diesel engine oil)  
 Nos of hours used New  
 Date of sampling S.59.11.3 Co'x Bazar (Bangladesh)  
 Testing conditions.

|                        |          |          |
|------------------------|----------|----------|
| Ignition temperature   | Unit °C  | over 190 |
| Viscosity              | cSt 40°C | 87.89    |
| Index of Contamination | % weight | —        |
| T A N                  | mg KOE/s | —        |
| T B N                  | mg KOE/s | 1.9      |
| Water content          | % weight |          |
| Metal content          | (ppm)    |          |
|                        | Ca       | 0        |
|                        | Ba       | 0        |
|                        | P        | 0        |
|                        | Zn       | 7        |
|                        | Fe       | 6        |
|                        | Cr       | 1        |
|                        | MO       | 2        |
|                        | Sn       | 8        |
|                        | Pb       | 2        |
|                        | Cu       | 0        |
|                        | Na       | 1        |
|                        | Mg       | 1        |
|                        | B        | 2        |
|                        | Al       | 4        |
|                        | V        | 8        |
|                        | Si       | 0        |

Comment : The purity of this oil is close to pure mineral oil with the lowest amount of additives. It is not recommendable to use this product as diesel engine oil.

Source : Technical service manual, Shell Co.Ltd.

FIG. 4-1 BADC WORKSHOP NETWORK



Source : Bangladesh Agricultural Development Corporation

TABLE 4-12 BADC WORKSHOP STAFF

Regional Workshop

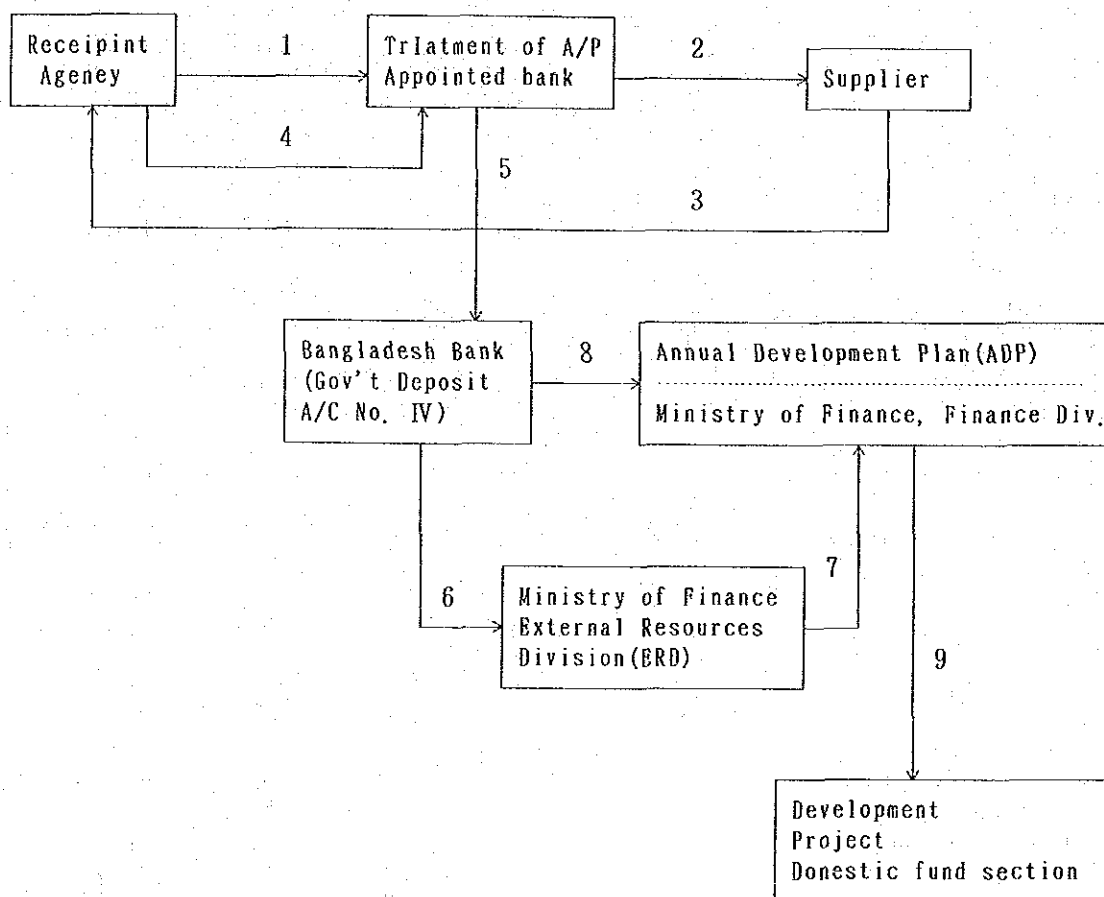
|                           |   |                       |    |
|---------------------------|---|-----------------------|----|
| 1. Executive Engineer     | 1 | 15. Fitter,           | 4  |
| 2. Assistant Engineer     | 4 | 16. Painter,          | 1  |
| 3. Sub Assistant Engineer | 4 | 17. Machinist,        | 12 |
| 4. Supdt.                 | 1 | 18. Carpenter,        | 1  |
| 5. Head Assistant         | 1 | 19. Welder,           | 10 |
| 6. Assistant Accountant   | 1 | 20. M. ec. Helper,    | 2  |
| 7. Stenographer           | 1 | 21. Machinist Helper  | 2  |
| 8. S. S. E                | 1 | 22. Carpenter Helper, | 1  |
| 9. O. A. C. T.            | 4 | 23. Fitter Helper,    | 2  |
| 10. Cashier,              | 1 | 24. Blacksmith,       | 1  |
| 11. Foreman,              | 1 | 25. Office Peon,      | 1  |
| 12. Sr. Mechanic          | 2 | 26. Messenger peon,   | 1  |
| 13. Mechanic,             | 1 | 27. Darwan,           | 6  |
| 14. Electrician,          | 1 | 28. Sweeper,          | 1  |
|                           |   | 29. Hammerman,        | 1  |

Zonal Workshop

|                       |   |                  |   |
|-----------------------|---|------------------|---|
| 1. Assistant Engineer | 1 | 12. Electrician, | 1 |
| 2. Head Assistant     | 1 | 13. Machinist,   | 1 |
| 3. O. A. C. T.        | 1 | 14. Welder,      | 1 |
| 4. A. C.              | 1 | 15. Fitter,      | 1 |
| 5. A. Ch.             | 1 | 16. Turner,      | 1 |
| 6. Foreman,           | 1 | 17. Blacksmith,  | 1 |
| 7. Sr. Mec.           | 2 | 18. M/peon,      | 2 |
| 8. Mech.              | 1 | 19. Darwan,      | 2 |
| 9. A. Mech.           | 1 | 20. Mach. Hel.   | 1 |
| 10. Sr. SK,           | 1 | 21. P/Helper,    | 1 |
| 11. C. C. Sk.         | 1 | 22. E/Helper,    | 1 |
|                       |   | 23. Hammerman,   | 1 |

Source : Bangladesh Agricultural Development Corporation

FIG. 4-2 FLOW-CHART FOR ACTUAL CONDITIONS  
FOR THE PROCESSING OF COUNTERPART FUND



1. Receipt agency submits a certificate warranting the its depositing of the counterpart fund to the bank handling A/P prior to the insurance of A/P.
2. Issuing of A/P to the supplier by the bank handling A/P.
3. Supplying of commissioning materials to the receipt agency by the supplier.
4. Depositing of counterpart fund in the appointed bank by the receipt agency (the amount is to be equivalent to 100% of CIF price within 2years after the receipt.)
5. Transferring of the counterpart fund deposited to the Bangladesh Bank by the appointed bank.
6. Notification of receipt to ERD by Bangladesh Bank.
7. Notification of receipt to the Finance Div. by ERD.
8. Incorporating of the counterpart fund into ADP budget by Finance Div.
9. Forwarding to the domestic fund section of Development Project.

TABLE 4-13 SECTORAL ESTIMATED EXPENDITURE OF THE ADP

(Unit : 100,000TAKA)

| Sector  | 1980/81<br>(Revised<br>ADP) | 1981/82<br>(Revised<br>ADP) | 1982/83<br>(Revised<br>ADP) | 1983/84<br>(Revised<br>ADP) | 1984/85<br>(Revised<br>ADP) | 1985/86<br>(Revised<br>ADP) |
|---|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|-----------------------------|
| Agriculture   | 322.7                       | 369.8                       | 472.1                       | 475.8                       | 314.12                      | 218.80                      |
| Rural Institutions  | 103.4                       | 112.7                       | 236.0                       | 449.0                       | 592.61                      | 593.67                      |
| Flood Control and Water<br>Resources  | 357.2                       | 399.5                       | 368.4                       | 469.6                       | 514.65                      | 409.49                      |
| Industry  | 336.7                       | 367.7                       | 314.5                       | 332.6                       | 239.79                      | 473.82                      |
| Power, Natural Resources and<br>Science and Technological<br>Research (S.T.R) | 377.8                       | 434.7                       | 629.5                       | 821.0                       | 845.78                      | 792.67                      |
| Transport   | 375.1                       | 380.2                       | 489.3                       | 262.4                       | 227.12                      | 274.71                      |
| Communication   | 71.3                        | 90.0                        | 76.0                        | 54.8                        | 70.01                       | 62.34                       |
| Physical Planning and<br>Housing  | 146.7                       | 177.4                       | 149.6                       | 143.6                       | 108.17                      | 96.91                       |
| Education, Training and<br>Public Administration                              | 107.9                       | 129.1                       | 120.4                       | 152.5                       | 157.42                      | 193.85                      |
| Health  | 65.8                        | 74.2                        | 80.8                        | 79.0                        | 99.24                       | 75.75                       |
| Family Planning and<br>Population control                                     | 69.6                        | 86.3                        | 85.6                        | 106.9                       | 110.98                      | 128.74                      |
| Social Welfare  | 24.2                        | 29.6                        | 13.8                        | 15.5                        | 18.34                       | 14.96                       |
| Labour and Manpower   | 10.5                        | 19.8                        | 20.5                        | 25.0                        | 20.15                       | 11.52                       |
| Cyclonic Reconstruction   | —                           | —                           | 27.6                        | —                           | —                           | —                           |
| Technical Assistance  | —                           | —                           | —                           | 60.7                        | 84.10                       | 101.16                      |
| Self financing of the<br>Corporate Sectors                                    | —                           | —                           | —                           | 62.0                        | 85.94                       | 357.33                      |
| Others  | —                           | —                           | 17.0                        | 74.3                        | 20.00                       | 20.00                       |
| Reserves  | —                           | 44.2                        | 25.0                        | —                           | —                           | —                           |
| TOTAL   | 2368.9                      | 2715.2                      | 3126.3                      | 3584.7                      | 3508.42                     | 3825.72                     |

Source : Annual Development Programme. (ADP)



TABLE 5-1 RECORD OF PROGRESS OF THE KURIGRAM PROJECT  
(AS OF JUNE 1986)

| Sl. No. | Item                            | Unit | Q'ty  | Amount achieved for June 1985 | Annual Operation Planning |         |         |         |         |         |         |         |      |
|---------|---------------------------------|------|-------|-------------------------------|---------------------------|---------|---------|---------|---------|---------|---------|---------|------|
|         |                                 |      |       |                               | 1985/86                   | 1986/87 | 1987/88 | 1988/89 | 1989/90 | 1990/91 | 1991/92 | 1992/93 |      |
| 1       | Earth Moving                    | ha   | 4,742 | 1,075                         | 267                       | 850     | 850     | 850     | 850     | 850     |         |         |      |
| 2       | Building                        | Unit | 341   | 52                            | 56                        | 91      | 91      | 91      |         |         |         |         |      |
| 3       | Dam                             | Km   | 183   | 148                           | 10                        | 17      |         |         |         |         |         |         |      |
| 4       | Dam Renovation                  | Km   | 108   | —                             | 6                         | 17      | 17      | 17      | 17      | 17      | 17      | 17      | 17   |
| 5       | Road Construction               | Km   | 36    | 1.3                           | 13.50                     | 13.50   | 7.70    |         |         |         |         |         |      |
| 6       | Barrage                         | No   | 1     | —                             | —                         | Part    | Part    | Part    | Part    | Part    | Part    | Part    | Part |
| 7       | Pumping Station                 | No   | 2     | —                             | —                         | —       | Part    | Part    | Part    | Part    | Part    | Part    | Part |
| 8       | Drainage Canal                  | Km   | 254   | 143                           | —                         | 55.50   | 55.50   | 55.50   | —       | —       | —       | —       | —    |
| 9       | Drainage Facility               | No   | 23    | 57%                           | 10%                       | 12%     | 12%     | 12%     | 12%     | 12%     | 12%     | 12%     | 12%  |
| 10      | Irrigation Canal                | Km   | 496   | —                             | —                         | —       | —       | —       | —       | 120     | 126     | 180     | 180  |
| 11      | Irrigation Facility             | No   | 93    | —                             | —                         | —       | —       | —       | —       | 23      | 23      | 23      | 23   |
| 12      | Power line Extension            | km   | 45    | —                             | —                         | 22.50   | 22.50   | 22.50   | 22.50   |         |         |         |      |
| 13      | Commodities                     | Item | 1     | Part                          | Part                      | Part    | Part    | Part    | Part    | Part    | Part    | Part    | Part |
| 14      | Vehicles                        | No   | 73    | 20                            | 25                        | 28      |         |         |         |         |         |         |      |
| 15      | Maintenance and Management Cost | Item | 1     | Part                          | Part                      | Part    | Part    | Part    | Part    | Part    | Part    | Part    | Part |

FIG. 5-1 KURIGRAM FLOOD CONTROL AND IRRIGATION PROJECT WORK PROGRESS (JUNE, 1985)

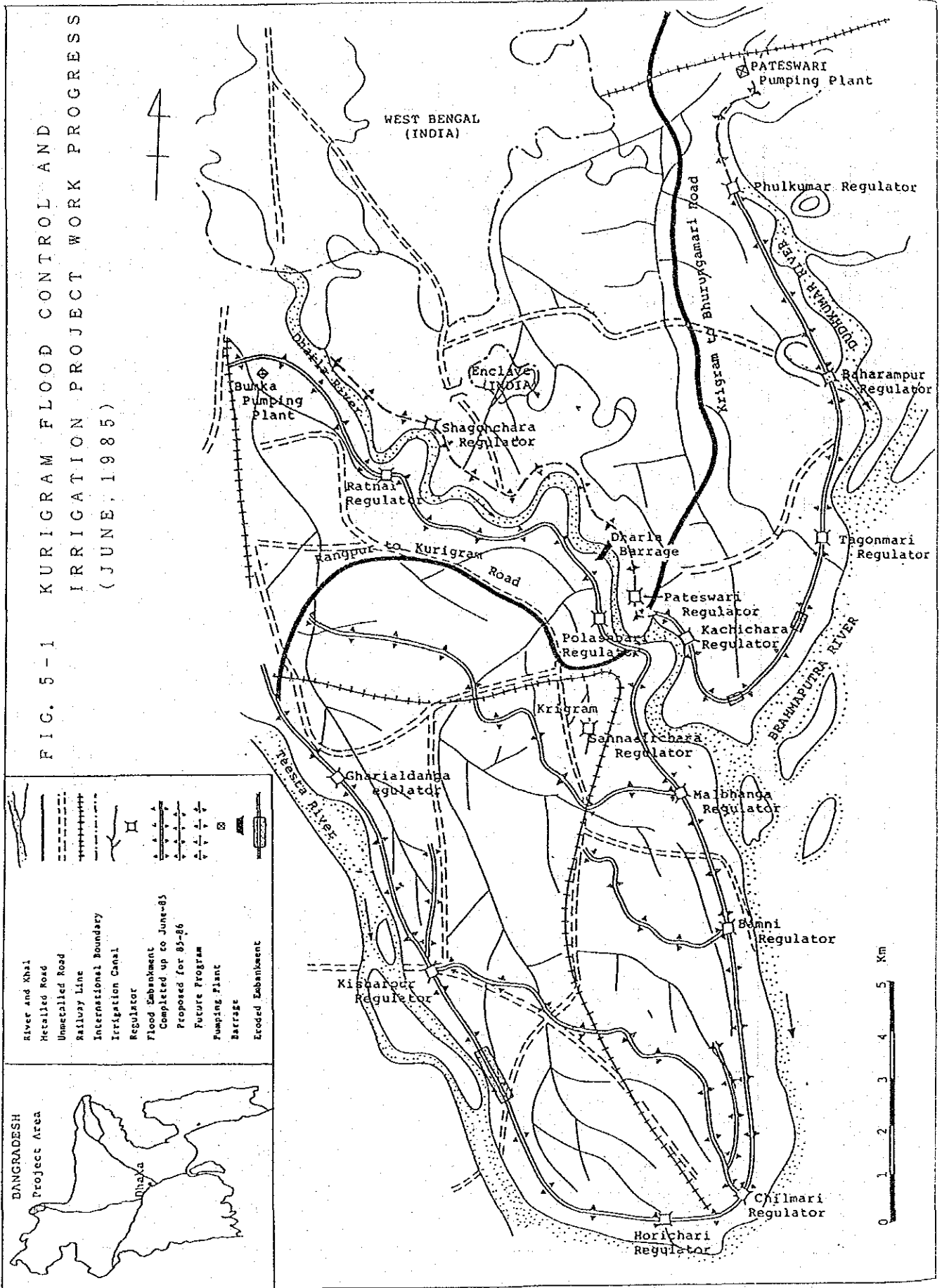


TABLE 5 - 2 TOTAL LENGTH OF HIGHWAY NETWORK

(Unit : Km)

| FY   | Paved | Unpaved | Total |
|------|-------|---------|-------|
| 1975 | 3,787 | 566     | 4,353 |
| 1976 | 3,851 | 566     | 4,417 |
| 1977 | 3,985 | 566     | 4,451 |
| 1978 | 4,076 | 566     | 4,642 |
| 1979 | 4,197 | 634     | 4,831 |
| 1980 | 4,284 | 1,407   | 5,691 |
| 1981 | 4,323 | 2,268   | 6,591 |
| 1982 | 4,777 | 2,655   | 7,432 |
| 1983 | 5,131 | 2,866   | 7,997 |
| 1984 | 5,404 | 3,112   | 8,516 |

Source : 1984 - 85 Statistical Yearbook of Bangladesh

NUMBER OF VEHICLES

| FY   | Household | Business | Bus   | Truck  | Jeep  | Wagon |
|------|-----------|----------|-------|--------|-------|-------|
| 1975 | 11,882    | 815      | 5,223 | 9,457  | 4,112 | 1,583 |
| 1976 | 12,409    | 837      | 5,264 | 9,469  | 4,570 | 1,586 |
| 1977 | 14,869    | 836      | 5,494 | 9,757  | 5,828 | 2,015 |
| 1978 | 16,692    | 881      | 5,773 | 10,871 | 6,354 | 2,385 |
| 1979 | 18,868    | 906      | 6,044 | 11,894 | 6,793 | 2,855 |
| 1980 | 21,685    | 1,130    | 6,457 | 12,522 | 7,185 | 3,557 |
| 1981 | 23,100    | 1,112    | 7,183 | 13,496 | 7,727 | 3,549 |
| 1982 | 23,723    | 1,194    | 7,710 | 14,486 | 7,936 | 3,808 |
| 1983 | 24,363    | 1,226    | 7,918 | 14,738 | 8,150 | 3,911 |
| 1984 | 25,020    | 1,259    | 8,131 | 15,132 | 8,370 | 4,016 |

Source : Statistical Yearbook of Bangladesh

TABLE 5 - 3 INDICATING FACTORS OF MOISTURE CONTENT

1) Moisture Content

| %    | Index Number |
|------|--------------|
| 13   | 0            |
| 14   | 10           |
| 15   | 30           |
| 16   | 60           |
| > 17 | 120          |

ACTIVE INDICATORS

PLUS

2) Insect Infestation

| Level      | Index Number |
|------------|--------------|
| Nil        | 0            |
| Light      | 10           |
| Medium     | 30           |
| Heavy      | 60           |
| very heavy | 120          |

PLUS

3) Damaged grains

| %   | Index Number |
|-----|--------------|
| < 1 | 0            |
| 1-2 | 10           |
| 2-4 | 30           |
| 4-6 | 60           |
| > 6 | 120          |

PASSIVE INDICATORS

PLUS

4) Pesticide treatments

| Number | Index Number |
|--------|--------------|
| 0      | 0            |
| 2      | 10           |
| 5      | 20           |
| 8      | 40           |
| > 8    | 80           |

1)+2)+3)+4) → Index No. Ra

| Index No. range | Recommended safe storage - months | Storability of stock |
|-----------------|-----------------------------------|----------------------|
| 0 - 10          | > 12                              | Extremely good       |
| 11 - 30         | 9 - 12                            | Very good            |
| 31 - 50         | 6 - 9                             | Good                 |
| 51 - 70         | 4 - 6                             | Average              |
| 71 - 90         | 2 - 4                             | Below average        |
| 91 - 110        | 1 - 2                             | Poor                 |
| > 110           | < 1                               | Very poor            |

FIG. 5-2 CHARACTERISTICS OF DRYER

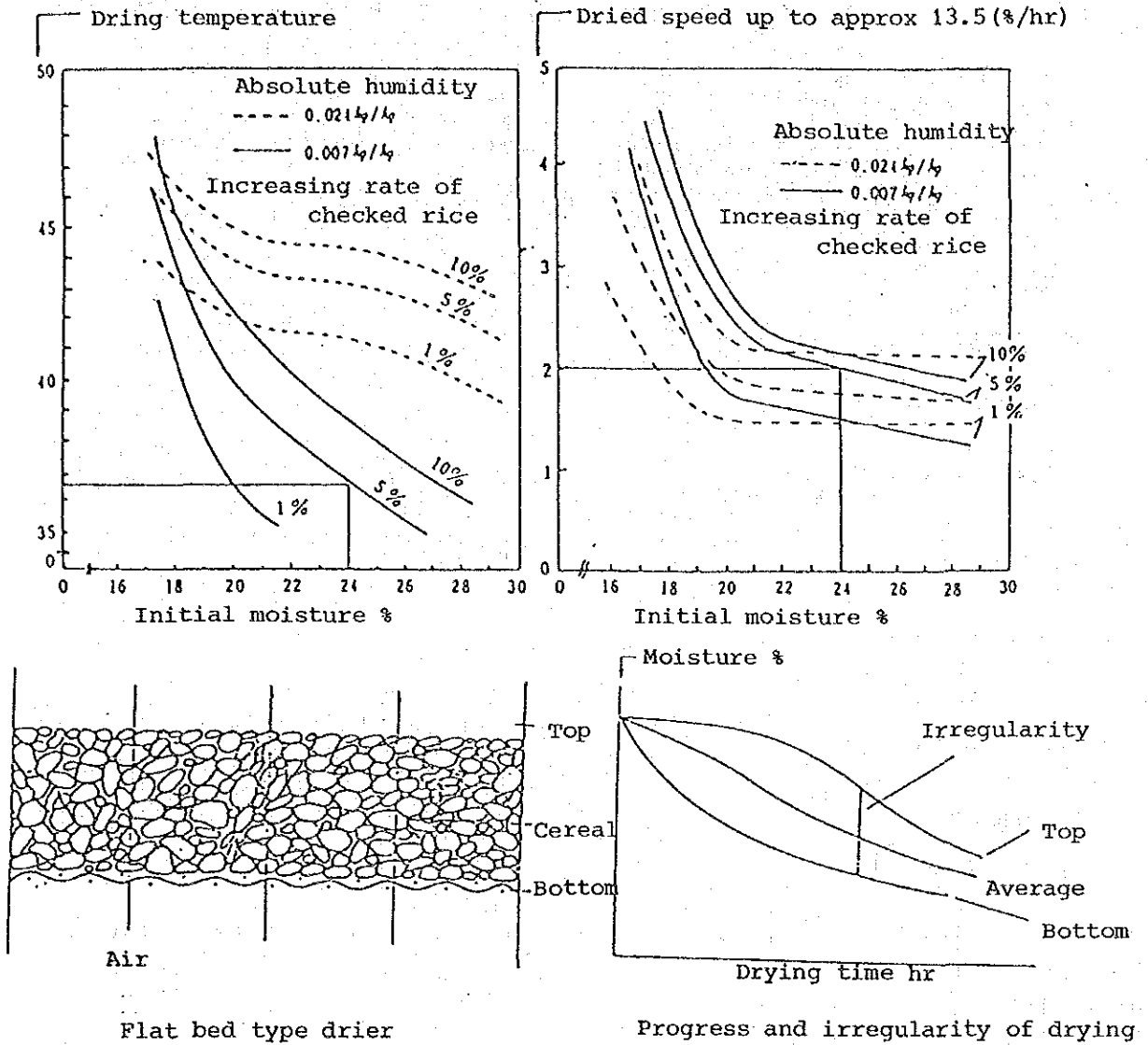


FIG. 5-3 IMPLEMENTATION SYSTEM OF AGRO-CHEMICALS, MINISTRY OF AGRICULTURE, PLANT PROTECTION WING

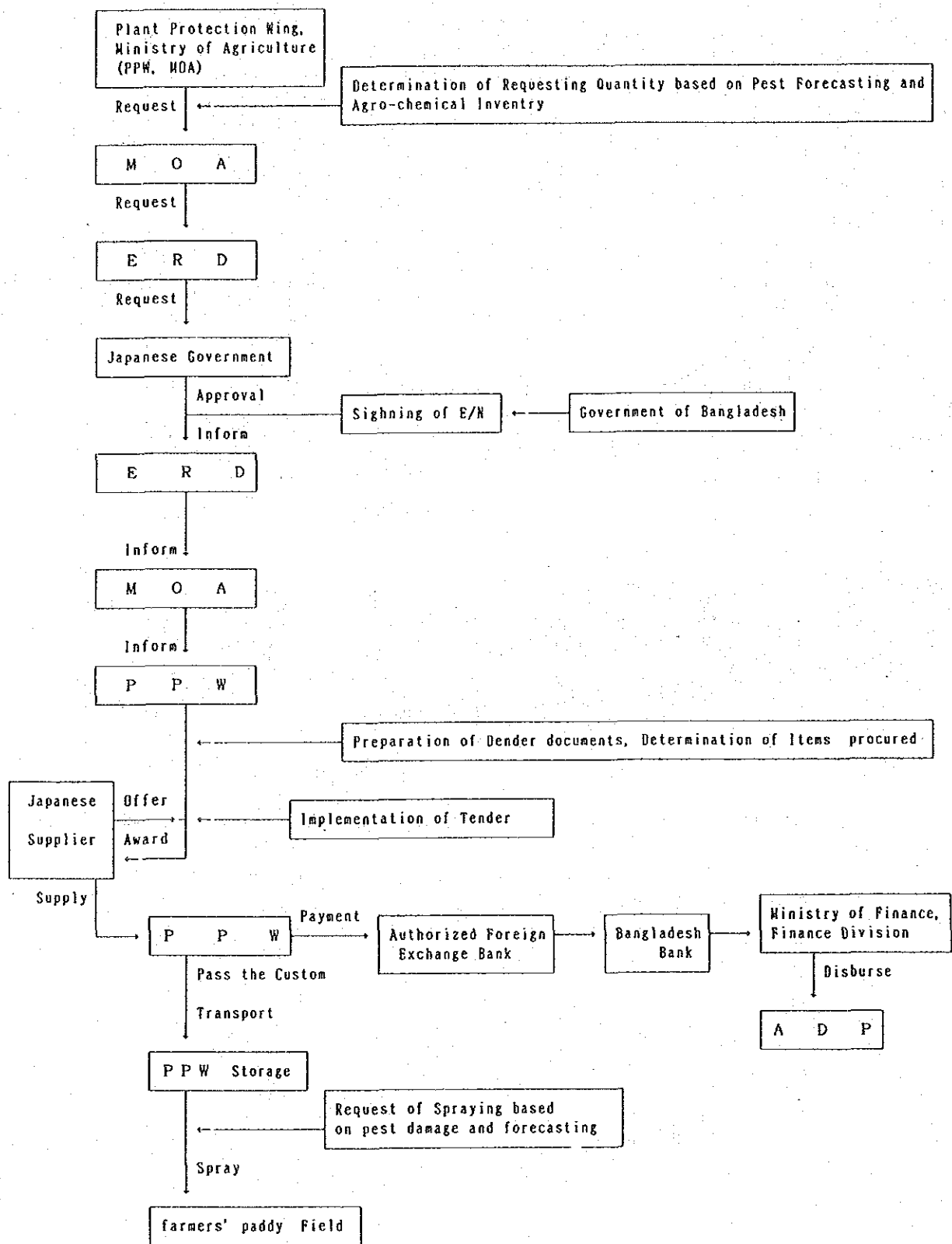


FIG. 5-4 IMPLEMENTATION SYSTEM OF AGRO-CHEMICALS, MINISTRY OF FOOD, DIRECTORATE OF FOOD

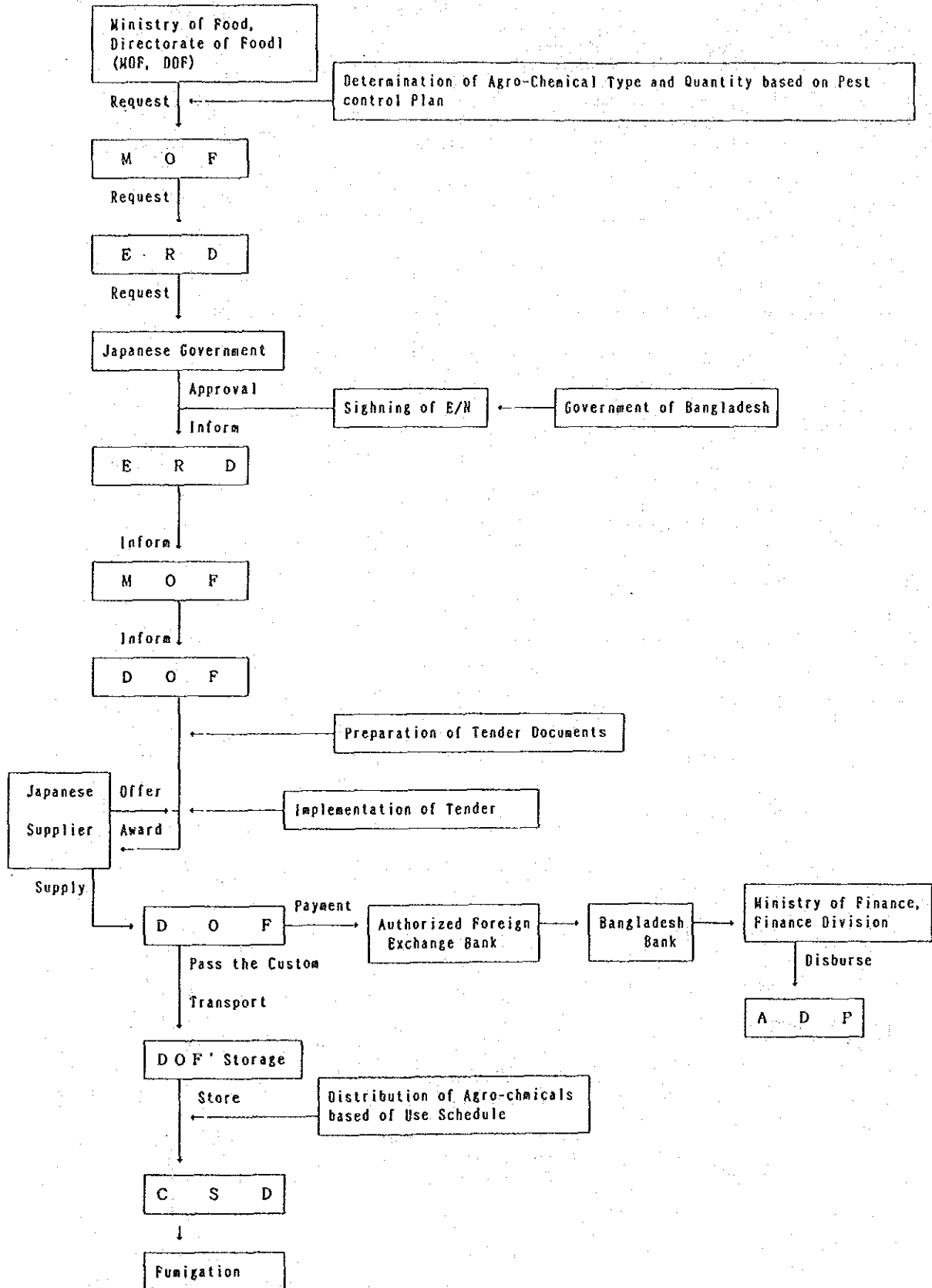


FIG. 5-5 IMPLEMENTATION SYSTEM OF AGRICULTURAL MACHINERY

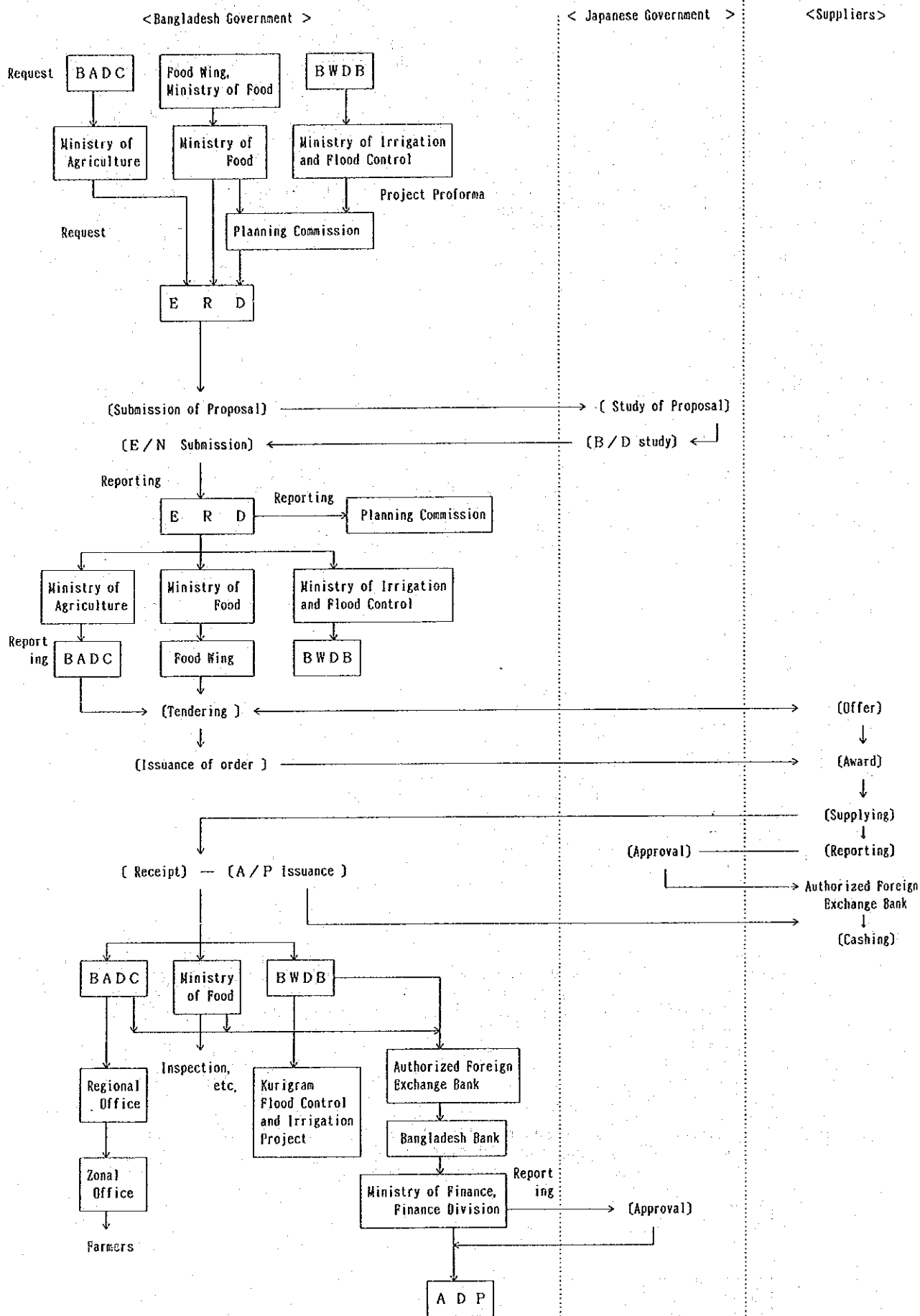




FIG. 5 - 6 KURIGRAM FLOOD CONTROL & IRRIGATION PROJECT

PROJECT STAFF STRUCTURAL DIAGRAM

Administractor Ministry : Ministry of Irrigation, Water Development & Flood Contr

Executing Agency : Bangladesh Water Development Board

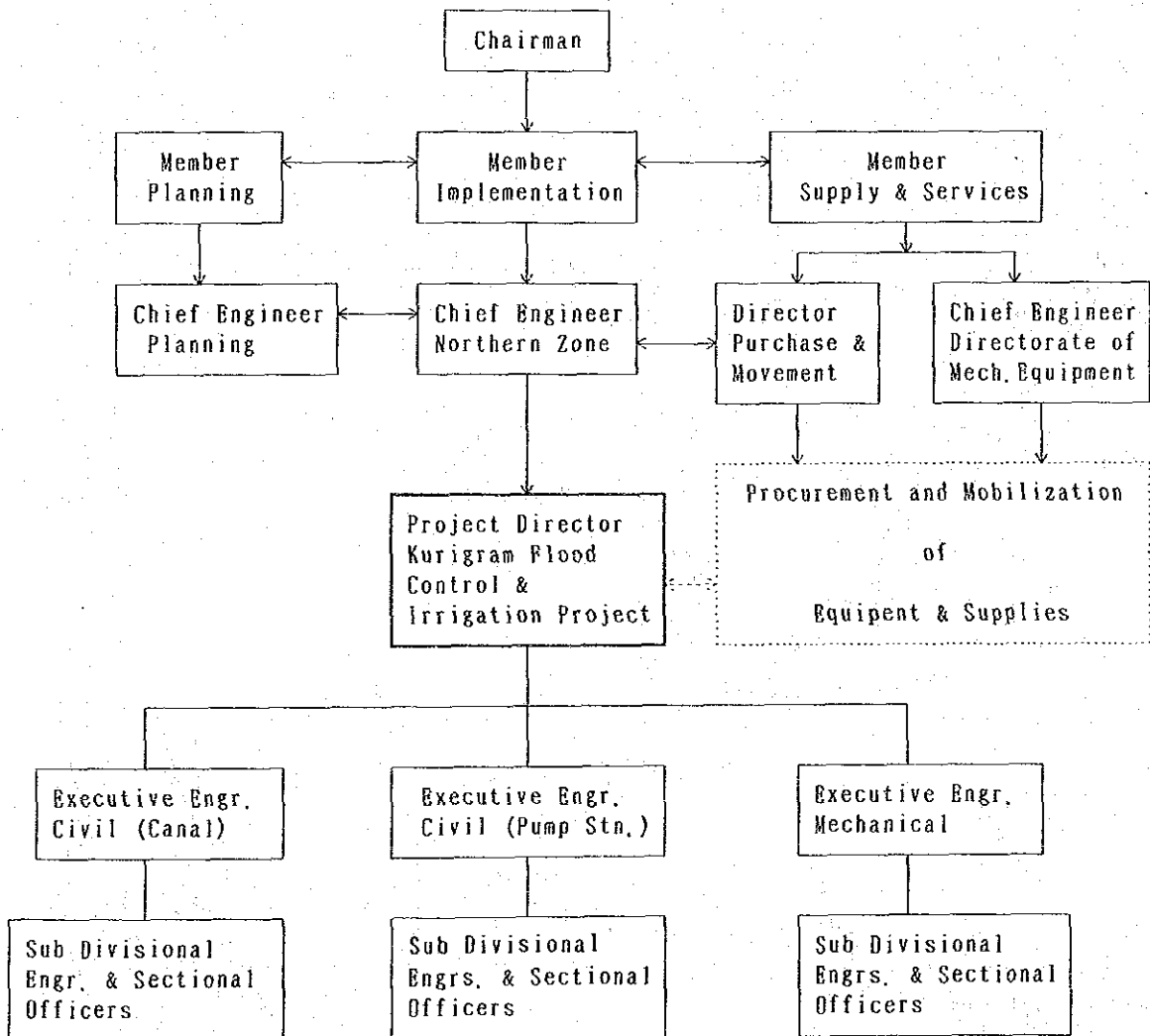


FIG. 6-1 SHAHJADPUR PUMP SITE

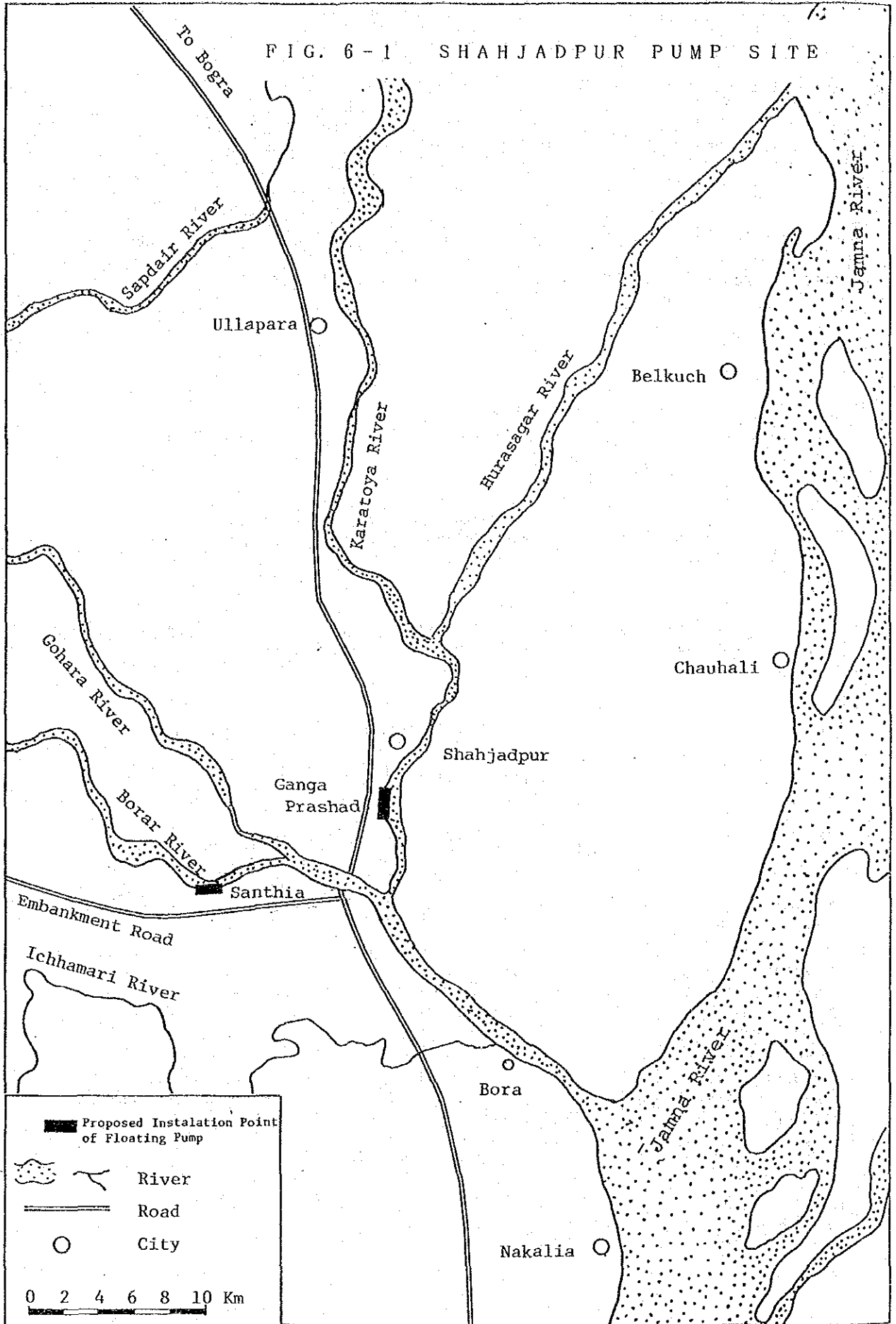


TABLE 6 - 1 RIVER STAGE, DISCHARGE VOLUME,  
AND RAINFALL OF THE KARATOA RIVER

1. River Stage of Karatoa River in 1985 (m)

| <u>Month</u> | <u>Max.</u> | <u>Min.</u> | <u>Month</u> | <u>Max.</u> | <u>Min.</u> |
|--------------|-------------|-------------|--------------|-------------|-------------|
| Jan.         | 6.02        | 5.56        | Jul.         | 10.50       | 8.57        |
| Feb.         | 5.54        | 5.16        | Aug.         | 10.11       | 9.28        |
| Mar.         | 5.15        | 4.87        | Sep.         | 10.11       | 9.57        |
| Apr.         | 5.54        | 4.77        | Oct.         | 9.67        | 8.35        |
| May          | 6.06        | 5.30        | Nov.         | 8.21        | 6.40        |
| Jun.         | 8.55        | 6.37        | Dec.         | 6.38        | 6.00        |

2. Discharge of Karatoa River in 1985/86 (m<sup>3</sup>/S)

| <u>Date</u>   | <u>Discharge</u> | <u>Date</u>   | <u>Discharge</u> |
|---------------|------------------|---------------|------------------|
| 24. Jun. 1985 | 377.3            | 28. Oct. 1985 | 399.26           |
| 22. Jul.      | 596.0            | 25. Nov.      | 156.96           |
| 19. Aug.      | 419.0            | 16. Dec.      | 58.54            |
| 16. Sep.      | 372.56           | 13. Jan.      | 57.69            |
|               |                  | 17. Feb.      | 84.80            |

3. Precipitation in 1985 (mm)

| <u>month</u> | <u>Precipitation</u> | <u>Month</u> | <u>Precipitation</u> |
|--------------|----------------------|--------------|----------------------|
| Jan.         | 0                    | Jul.         | 235                  |
| Feb.         | 0                    | Aug.         | 235                  |
| Mar.         | 61                   | Sep.         | 183                  |
| Apr.         | 53                   | Oct.         | 114                  |
| May          | 211                  | Nov.         | 0                    |
| Jun.         | 248                  | Dec.         | 1                    |

Source : Bangladesh Agricultural Development Corporation

FIG. 6-2 PLANNING LAYOUT OF FLOATING  
 PUMP SITE, SHAHJADPUR UPA-ZILA,  
 GANGA PRASHAD no scale

PLAN

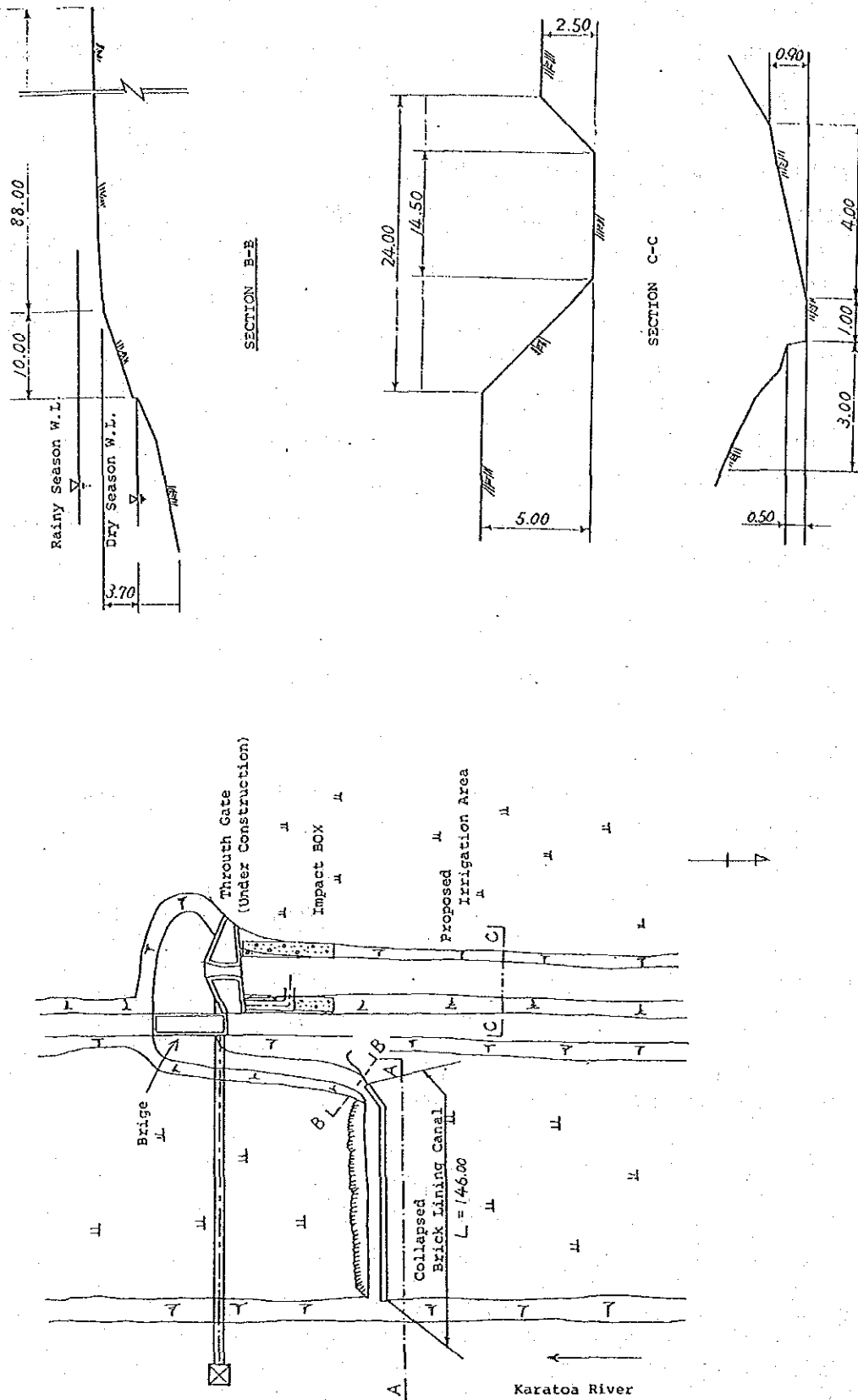
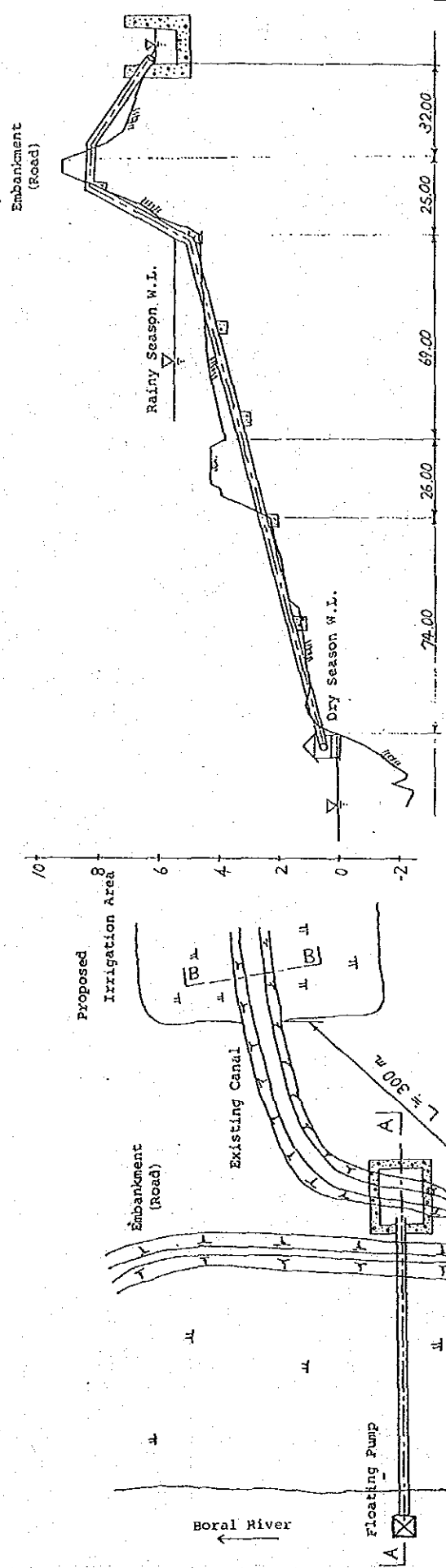


FIG. 6-3 PLANNING LAYOUT OF FLOATING PUMP SITE, SHAHJADPUR UPA-ZILA, SANTHIA

PLAN

SECTION A-A



SECTION B-B

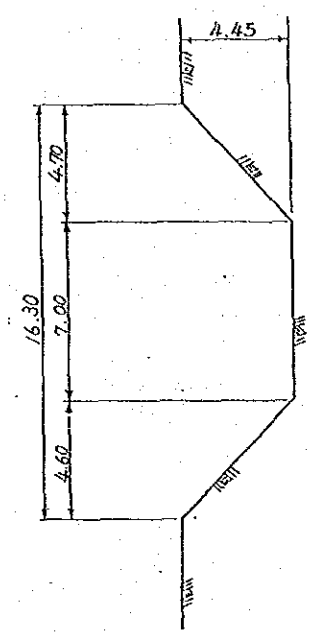


FIG. 6-4 GAZARIA PUMP SITE

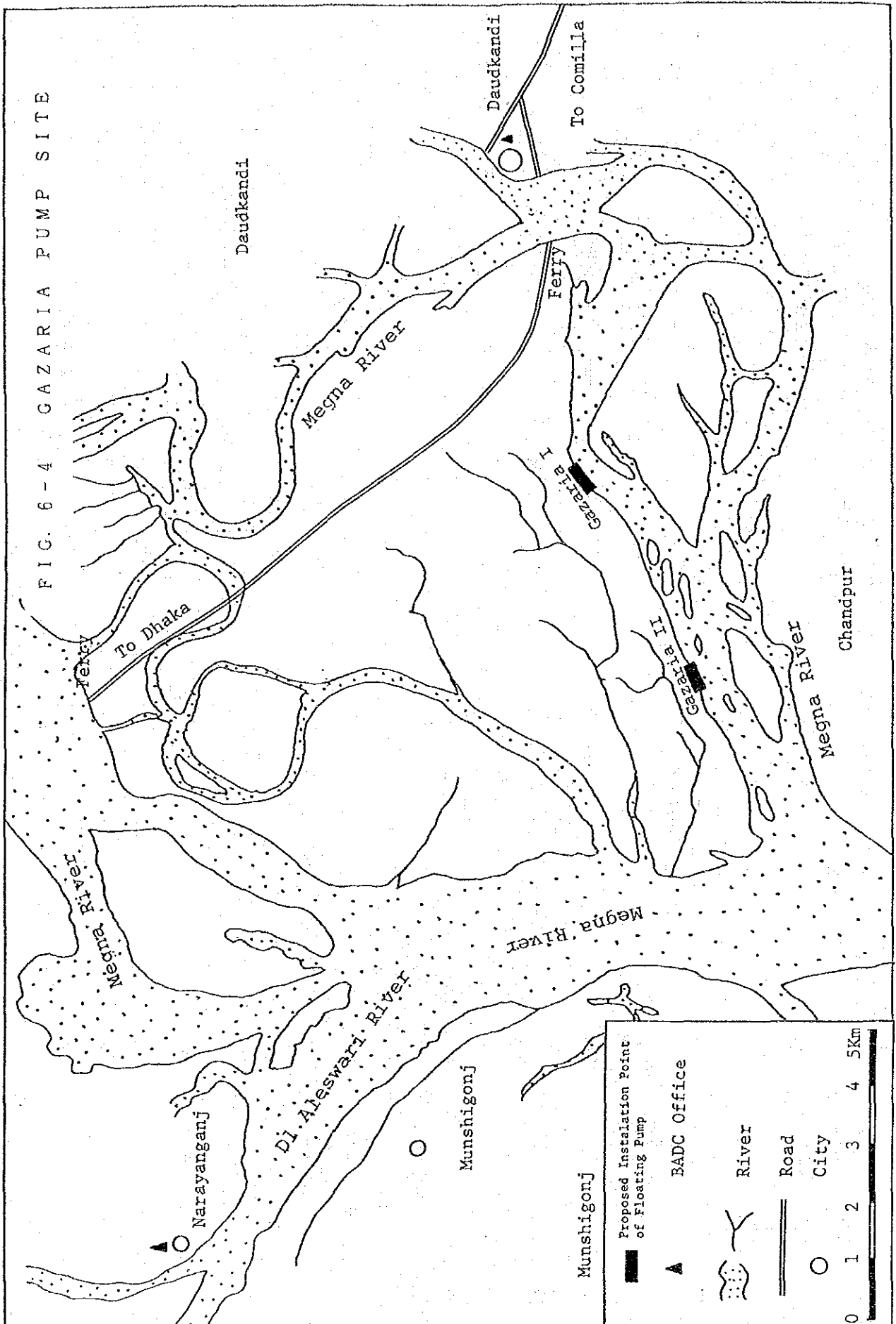


FIG. 6-5 PLANNING LAYOUT OF FLOATING PUMP SITE  
 GAZARIA UPA-ZILA, GAZARIA I

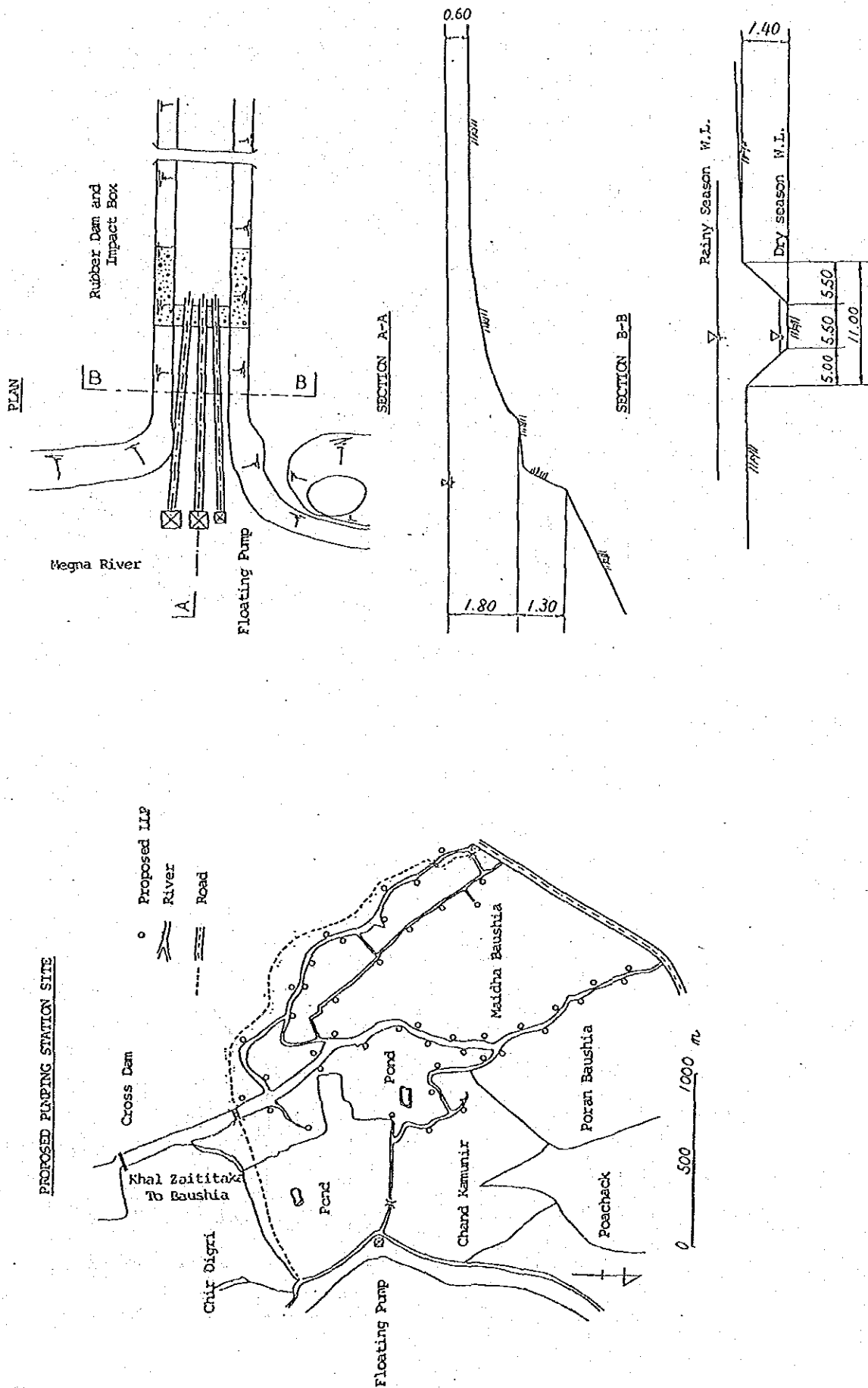
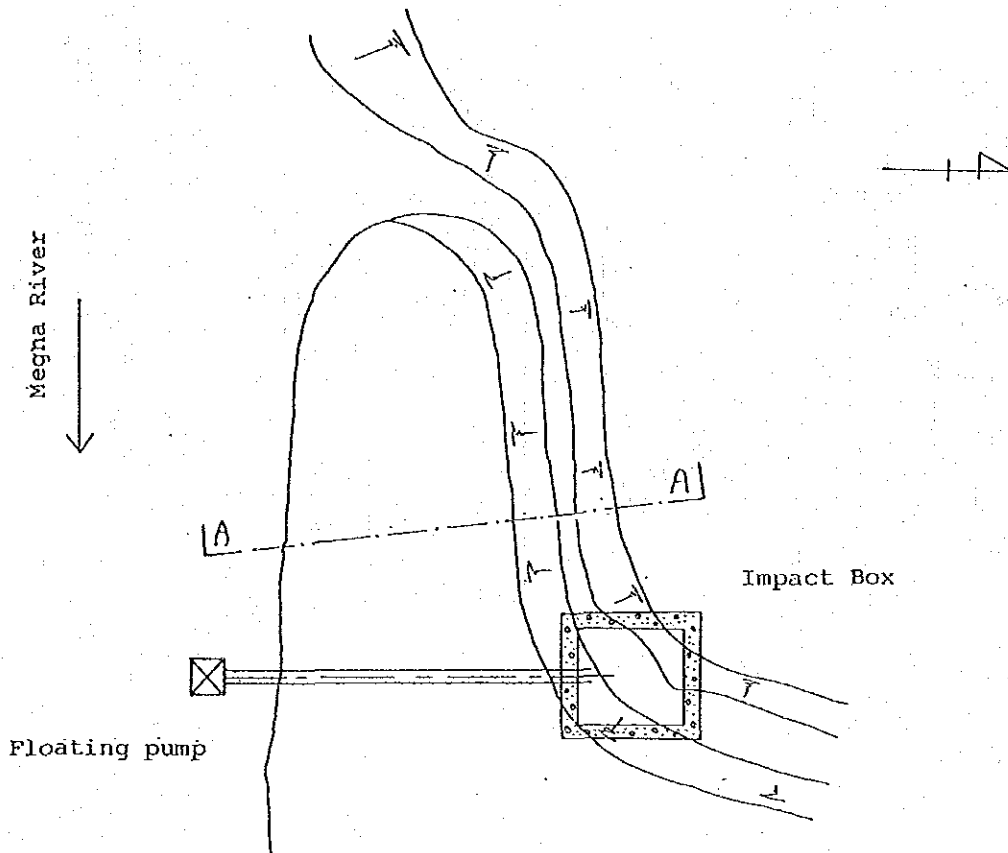
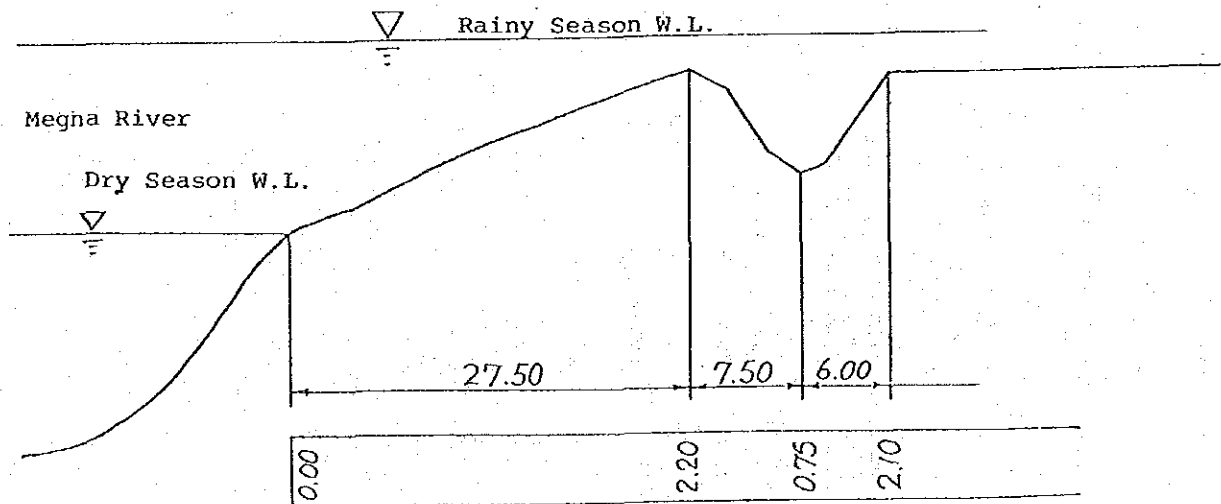


FIG. 6-6 PLANNING LAYOUT OF FLOATING PUMP SITE GAZARIA UPA-ZILA, GAZARIA II no scale

PLAN



SECTION A-A





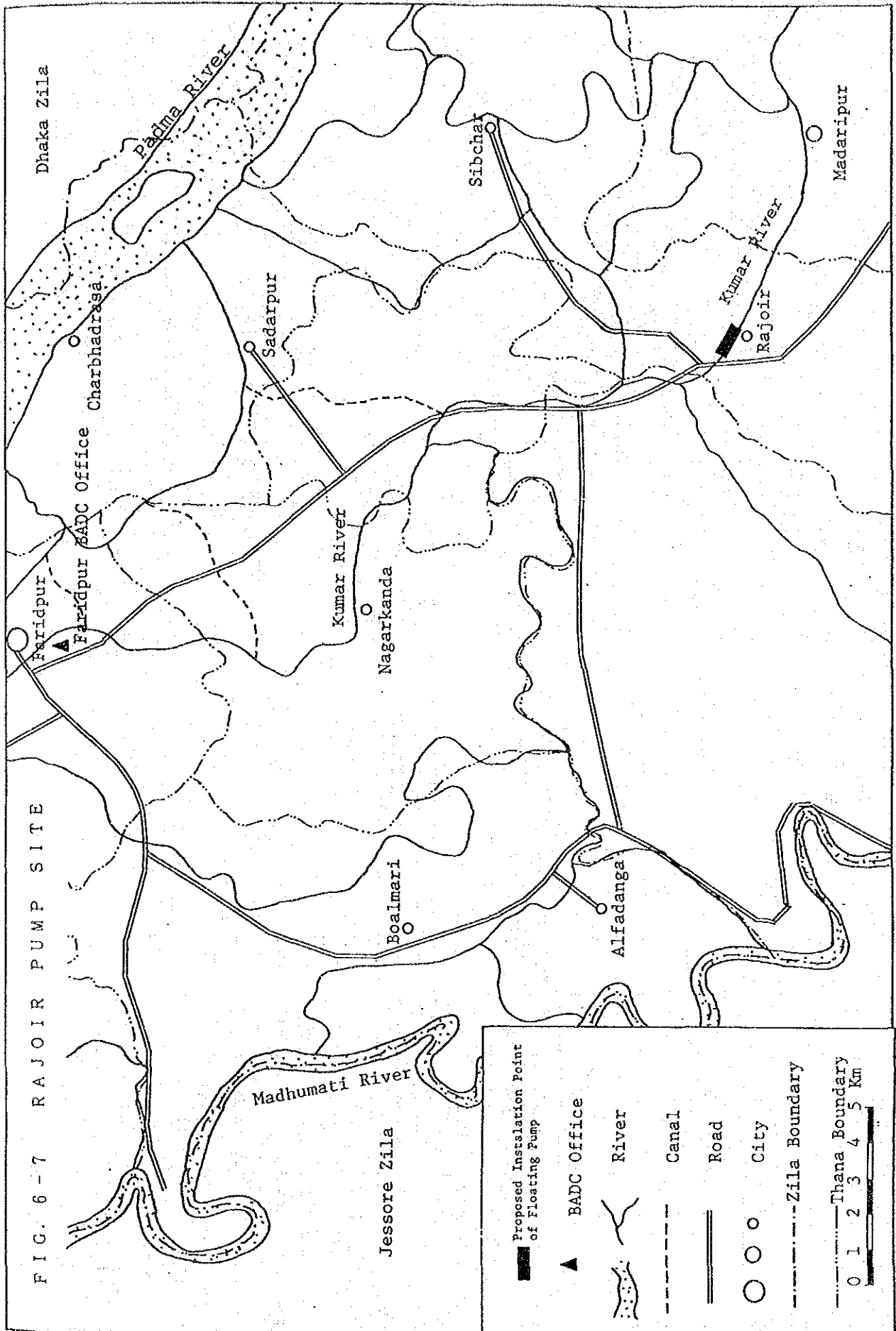
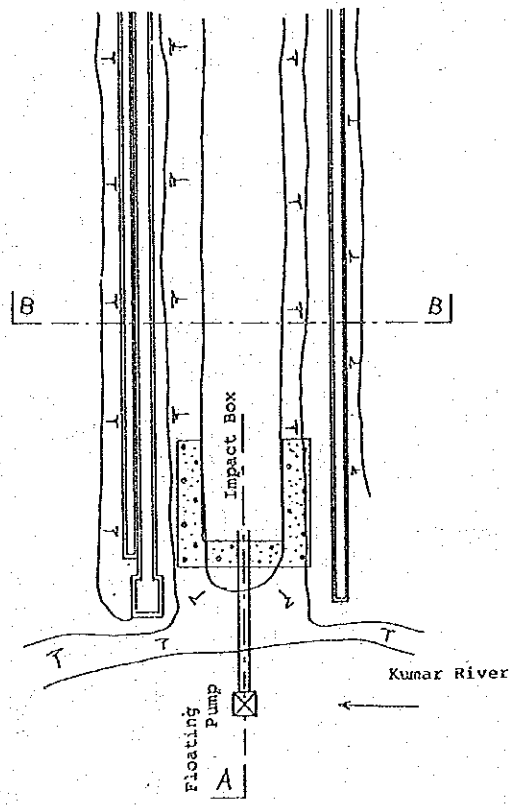


FIG. 6-7 RAJOIR PUMP SITE

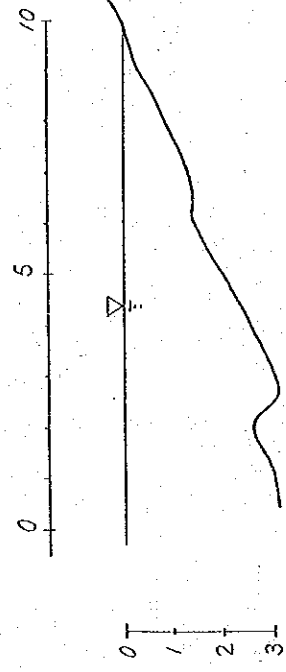
|  |  |
|--|--|
|  | Proposed Installation Point of Floating Pump |
|  | BADC Office                                  |
|  | River  |
|  | Canal  |
|  | Road   |
|  | City   |
|  | Zila Boundary                                |
|  | Thana Boundary                               |
|  | 0 1 2 3 4 5 Km                               |

FIG. 6-8 PLANNING LAYOUT OF FLOATING  
 PUMP SITE, RAJOIR UPA-ZILA,  
 no scale  
 TAKERHAT

PLAN



SECTION A-A



SECTION B-B

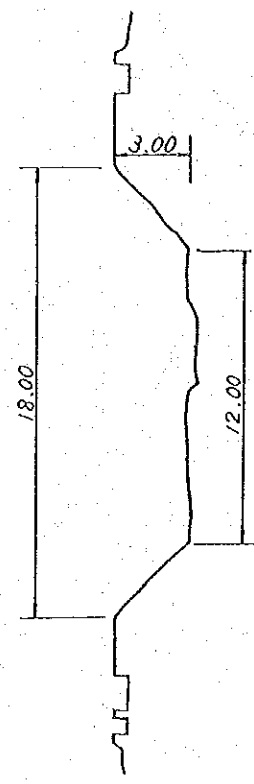


FIG. 6-9 DAUDKANDI PUMP SITE

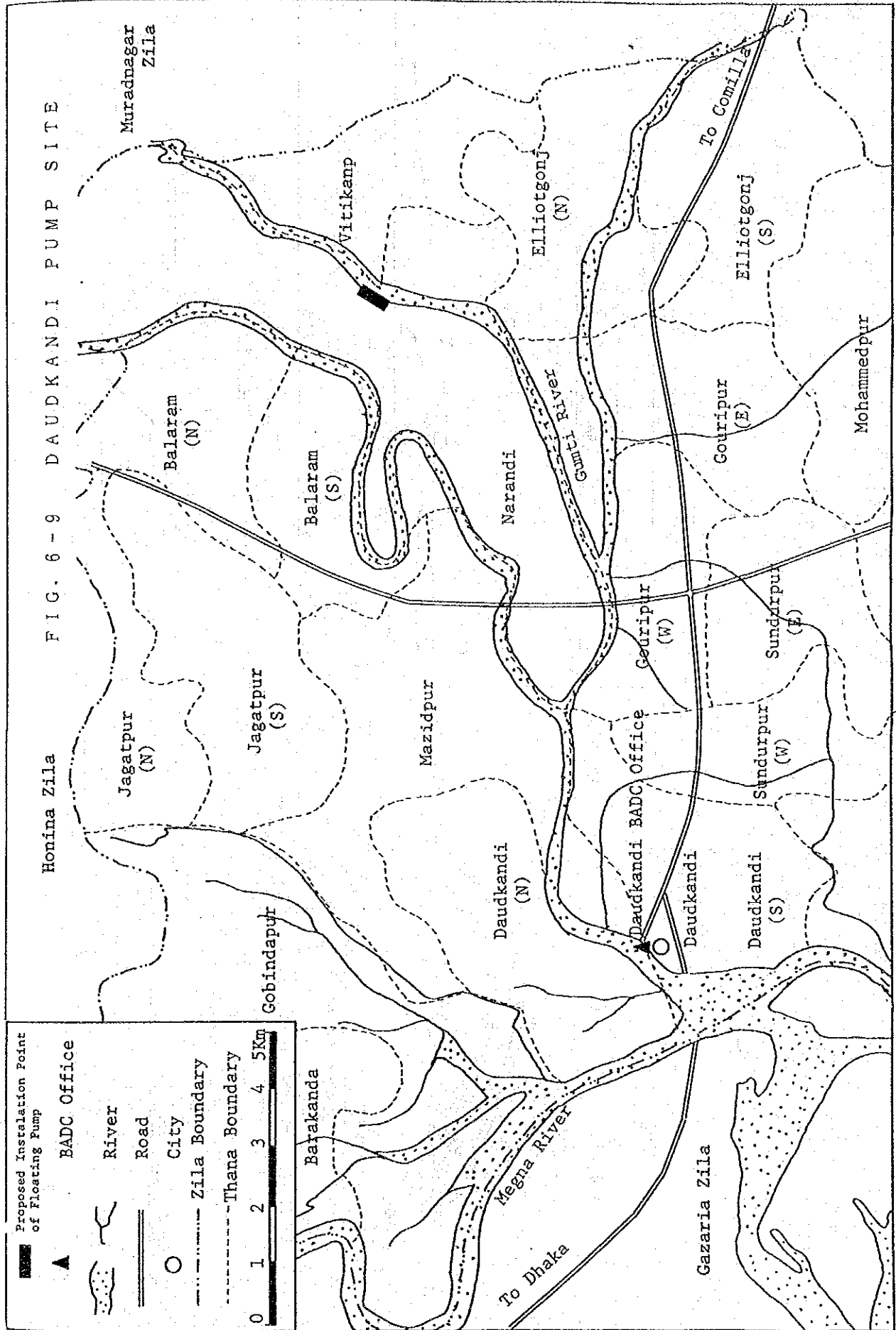
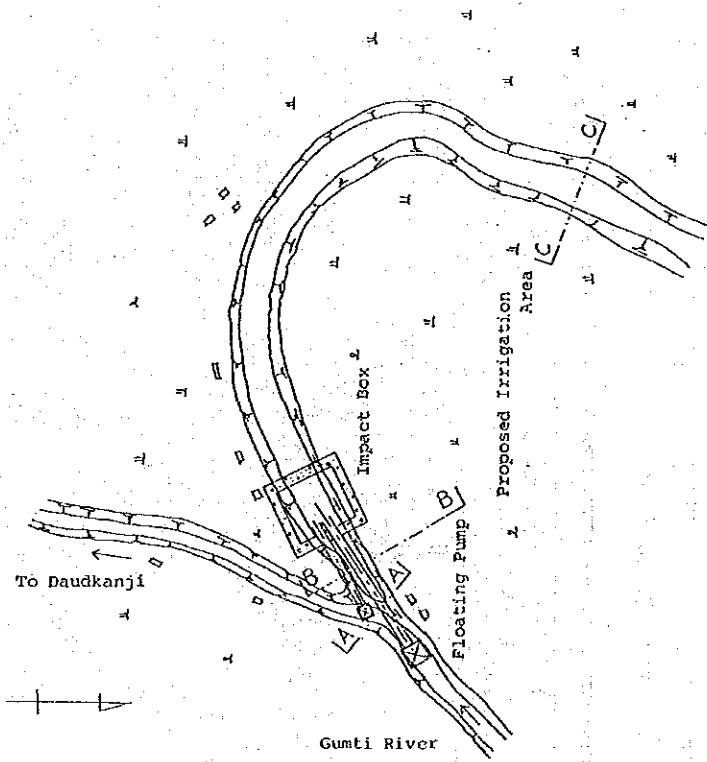
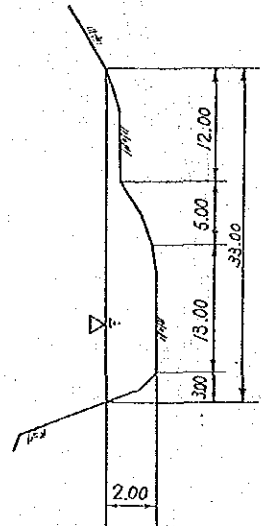


FIG. 6-10 PLANNING LAYOUT OF FLOATING  
 PUMP SITE, DAUDKANDI UPA-ZILA,  
 ASMANIA BAZAR

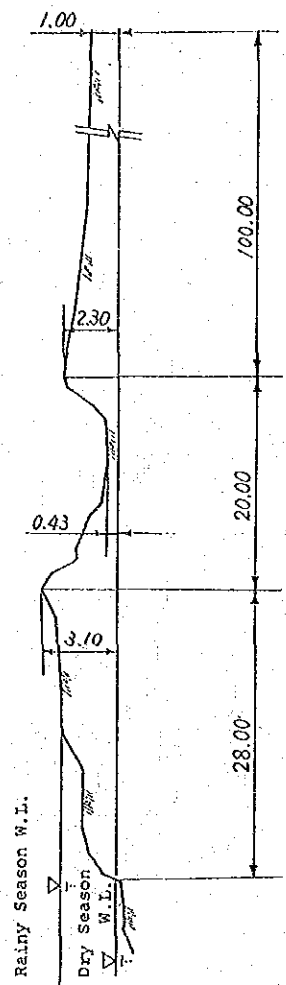
PLAN



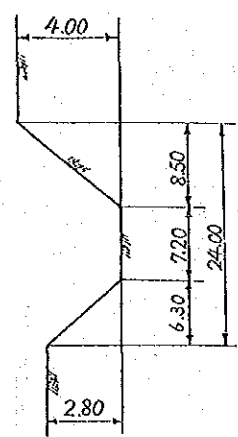
SECTION A-A



SECTION B-B



SECTION C-C



$\phi 400$   
 $0.35 \text{ m}^3/\text{sec}$

FIG. 6-II IMPACT BOX, SHAHJADPUR UPA-ZILA,

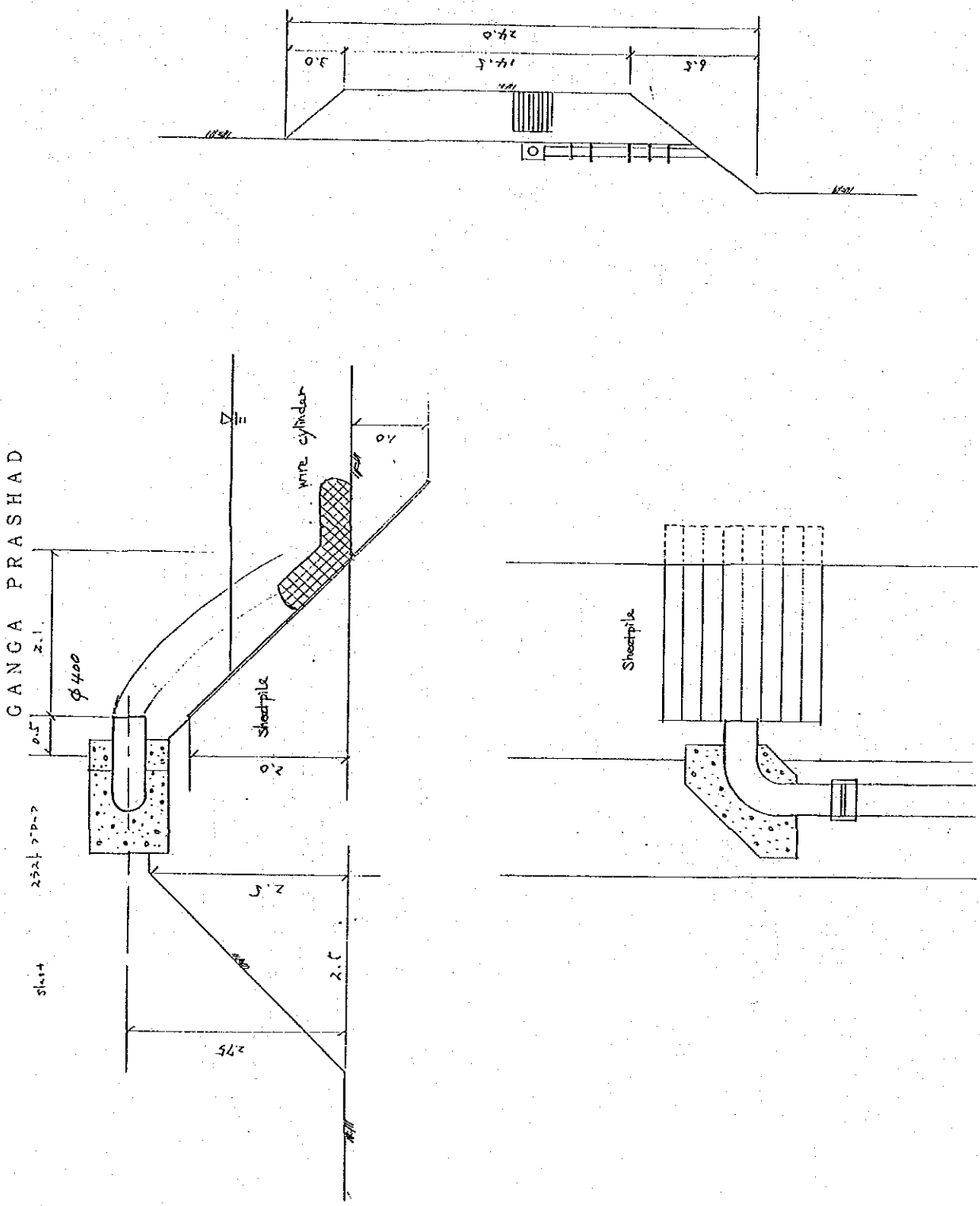


FIG. 6-12 IMPACT BOX, SHAHJADPUR UPA-ZILA,

SANTHIA

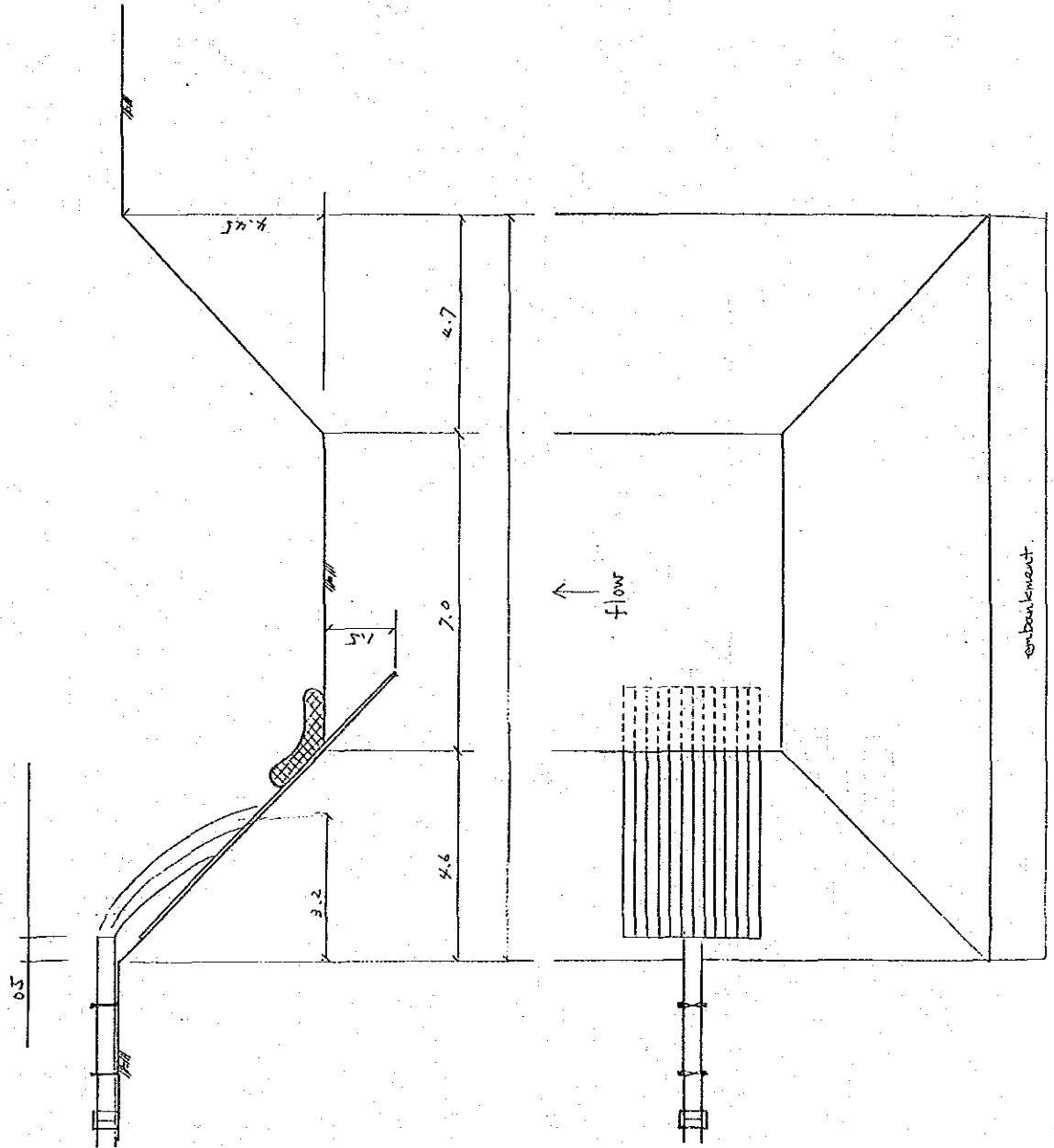
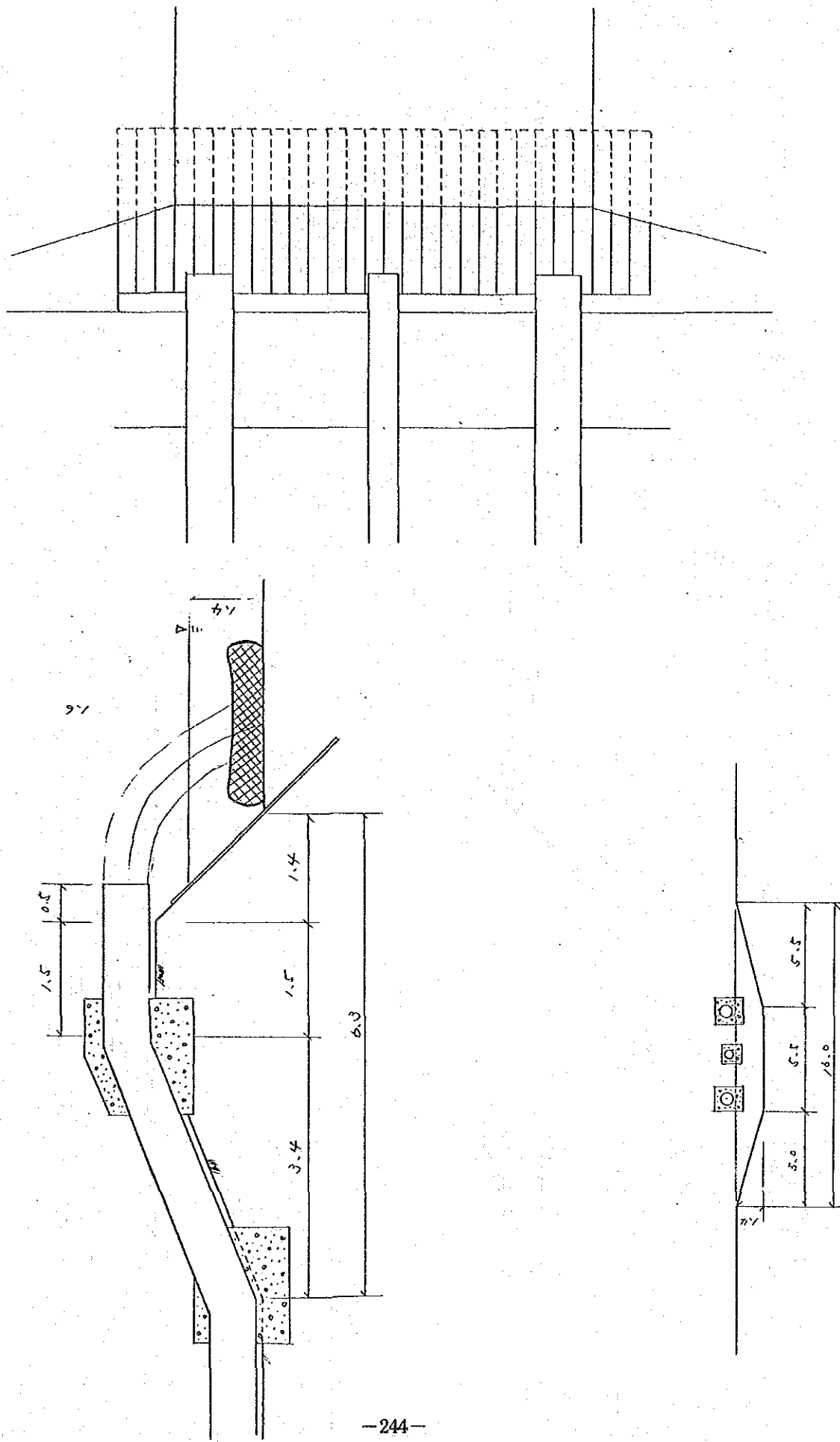


FIG. 6-13 IMPACT BOX, GAZARIA UPA-ZILA, GAZARIA I



$\phi 400$   
 $0.35 \text{ m}^3/\text{sec}$   
 FIG. 6-14 IMPACT BOX, GAZARIA UPA-ZILA, GAZARIA II

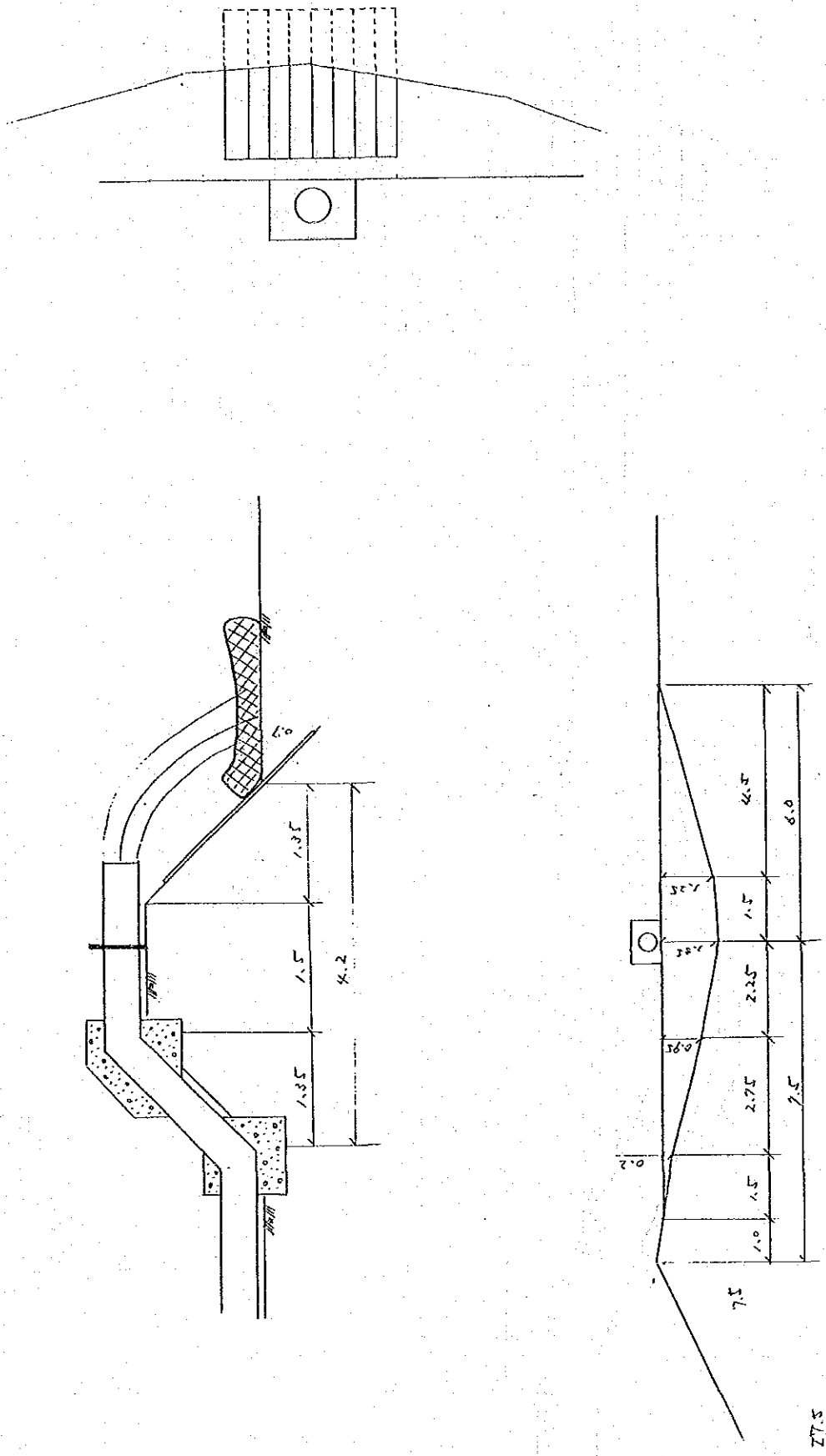




FIG. 6-15 IMPACT BOX, RAJOIR UPA-ZILA, TAKERHAT

$\phi$  400  
0.85 m<sup>3</sup>/sec

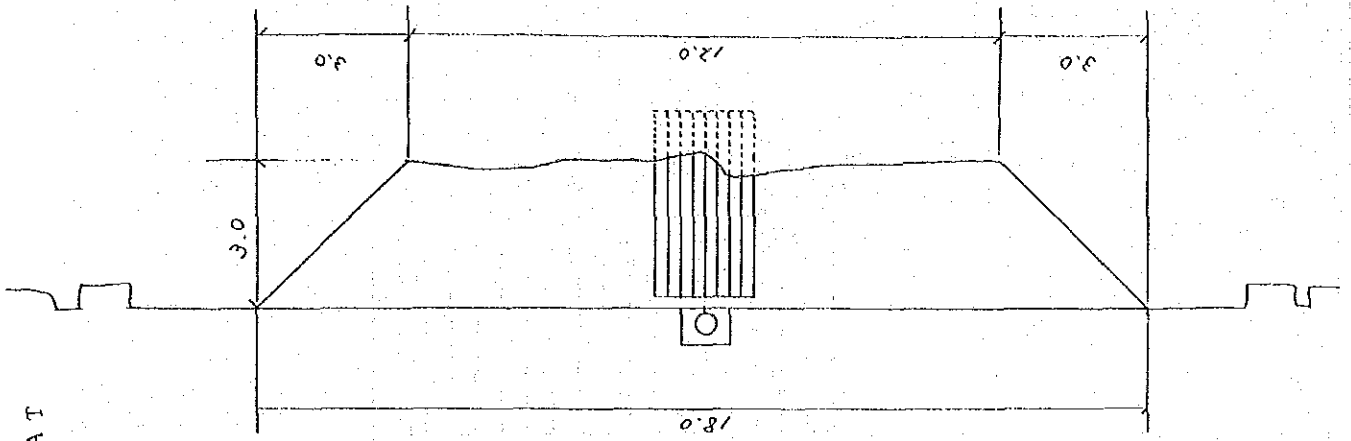
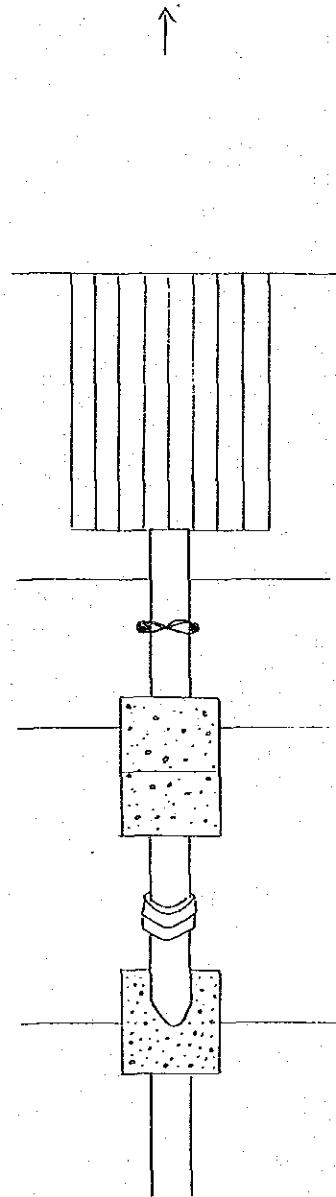
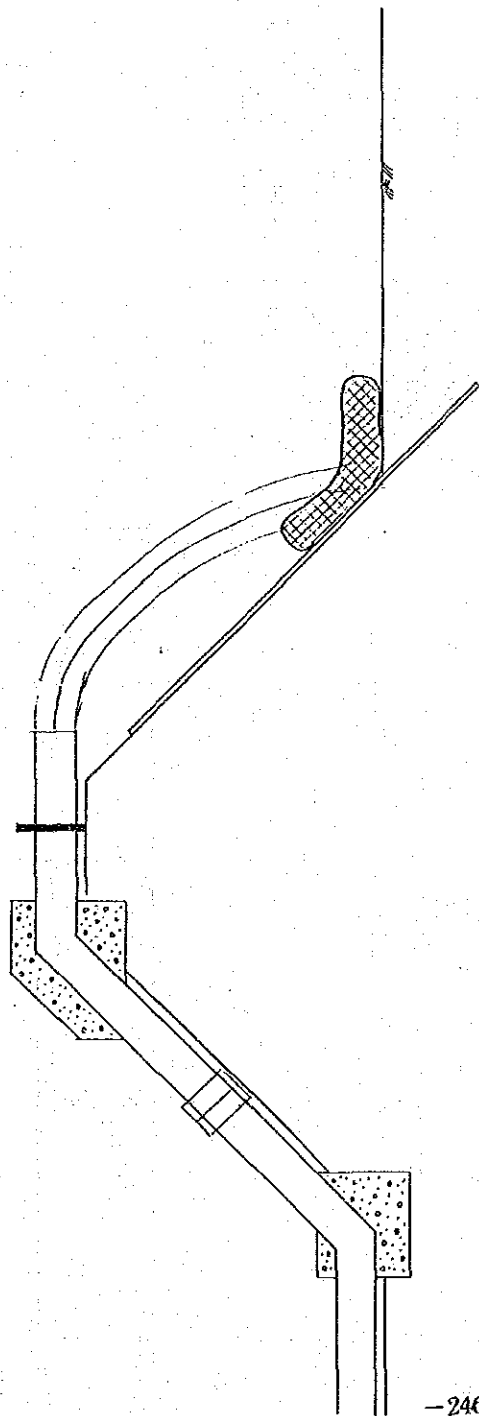


FIG. 6-16 IMPACT BOX, DAUDKANDI UPA-ZILA,  
 ASMANIA BAZAR

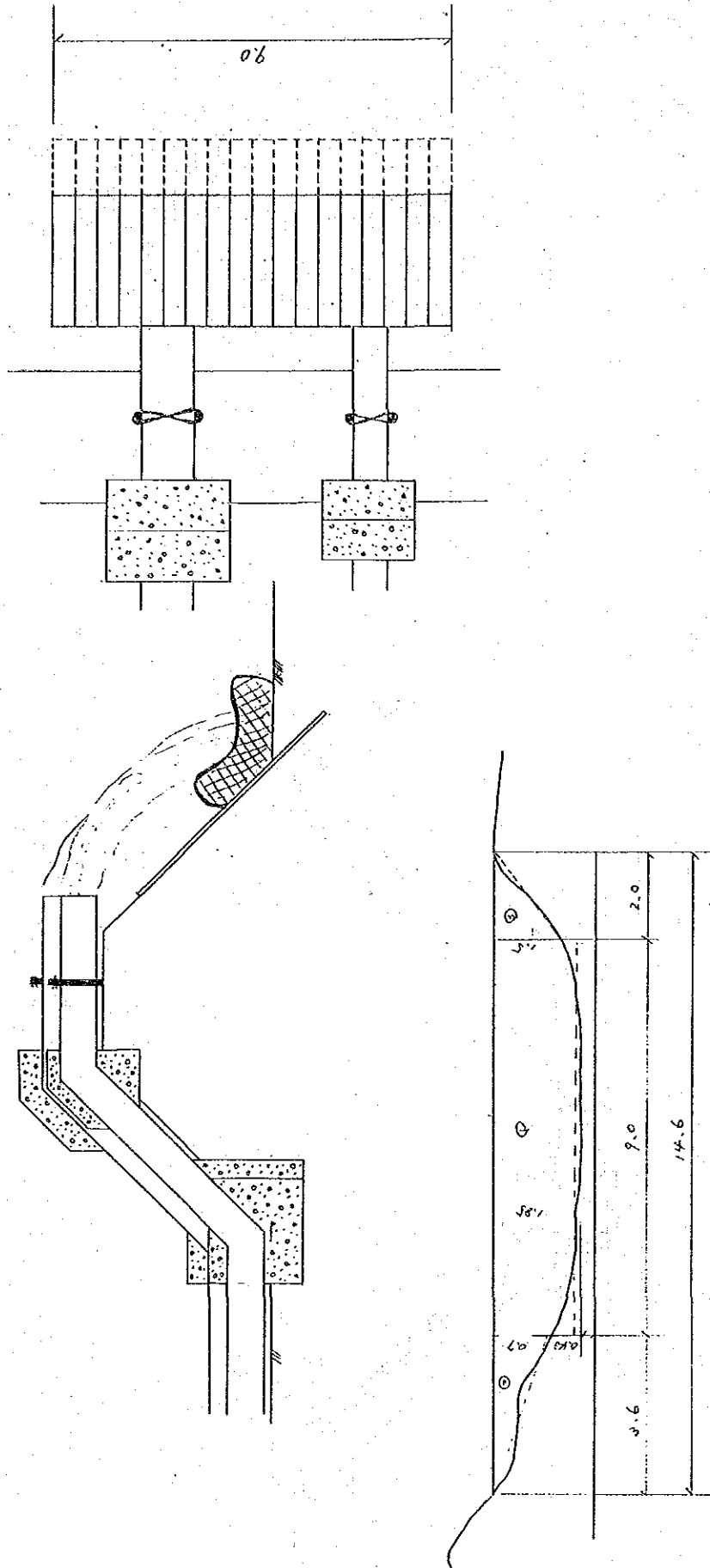


TABLE 6-2 STAFF PLANNING FOR BADC  
FLOATING PUMP PROJECT

1. Project Manager's Office

| Name of Post            | Total |
|-------------------------|-------|
| 1. Project Manager      | 1     |
| 2. Executive Engineer   | 2     |
| 3. Assistant Engineer   | 3     |
| 4. Stenographer         | 2     |
| 5. accountant           | 1     |
| 6. Head Assistant       | 2     |
| 7. Assistant Accountant | 2     |
| 8. Draftsman            | 1     |
| 9. Store Keeper         | 1     |
| 10. Assistant Cashier   | 1     |
| 11. Office Assistant    | 3     |
| 12. Driver              | 5     |
| 13. Cash Guard          | 1     |
| 14. Peon/Messenger      | 4     |
| 15. Night Guard         | 3     |
| 16. Truck Helper        | 2     |
|                         | 34    |

2. Self Propelled Tug

|                   |   |
|-------------------|---|
| 1. Master - 1     | 1 |
| 2. Wheelman       | 1 |
| 3. Licence Driver | 1 |
| 4. Lasker         | 2 |
| 5. Greaser        | 2 |
|                   | 7 |

3. Pontoon

|                          |       |
|--------------------------|-------|
| 1. Mechanic cum Operater | 600   |
| 2. Darwan                | 560   |
|                          | 1,160 |

Source : Bangladesh Agricultural Development Corporation



## **ANNEXES**



1. Member List of JICA Survey Team

|                   |   |   |
|-------------------|---|---|
| Koichi MORITA     | Team Leader                               | Assistant Director,<br>Grant Aid Division,<br>Economic Cooperation Bureau,<br>Ministry of Foreign Affairs               |
| Tadashi MAEDA     | Cooperation<br>Planning                   | Chief Officer,<br>Overseas Public Investment<br>Division, International Finance<br>Bureau, Ministry of Finance          |
| Hideyuki KANAMORI | Agricultural<br>Development<br>Planning   | Development Specialist,<br>Institute for International<br>Cooperation, Japan International<br>Cooperation Agency (JICA) |
| Yasutaka TOYAMA   | Agro-Economy                              | International Project Department<br>Chuo Kaihatsu Corporation   |
| Yoshihisa ZAITSU  | Crop Production                           | International Project Department<br>Chuo Kaihatsu Corporation   |
| Takishi TAMURA    | Crop Protection                           | International Project Department<br>Chuo Kaihatsu Corporation   |
| Masami SUDA       | Agricultural<br>Machinery &<br>Irrigation | International Project Department<br>Chuo Kaihatsu Corporation   |

## 2. ITINERARY OF STUDY TEAM

| Date       | Contacted Agency  | Work  |
|------------|---|---|
| 3/27 (THU) | (Travel)  | Tokyo(CX501, 703)→Bangkok   |
| 3/28 (FRI) | (Travel)<br>Japanese Embassy  | Bangkok (TG321) →Dhaka<br>Courtesy Call<br>Meeting on Study Itinerary   |
| 3/29 (SAT) | BRD<br>Planning Commission  | Meeting on Study Contents<br>Explanation of Study Objectives<br>Exchange of Opinions  |
| 3/30 (SUN) | Ministry of Agriculture<br><br>BADC<br><br>BWDB                           | Explanation of Study Objectives<br>Discussion on Fertilizer<br><br>Explanation of Study Objectives<br>Discussion on Fertilizer & Floating Pump<br><br>Explanation of Study Objectives<br>Discussion on Irrigation Machine   |
| 3/31 (MON) | Ministry of Food (MOF)<br><br>Bangladesh Bank<br><br>Directorate of Food  | Explanation of Study Objectives<br>Discussion on Agro-Chemicals &<br>Agricultural Machinery<br><br>Explanation of Study Objectives<br>Discussion on Counterpart Fund Situation<br><br>Explanation of Study Objectives<br>Discussion on Agro-Chemicals &<br>Agricultural Machinery |
| 4/ 1 (TUE) | Field Survey  | Field Survey in Dhaka, Comilla districts<br><br>Inspection of N-N Irrigation Project  |
| 4/ 2 (WED) | World Bank<br><br>ADB<br><br>Ministry of Agriculture                      | Explanation of Study Objectives<br>Discussion on Assistance<br><br>- do -<br><br>Answers of Questionnaire and Discussion<br>Data Collection   |
| 4/ 3 (THU) | Wrap-Up Meeting<br><br>MOF<br><br>Department of<br>Agricultural Extension | Discussion on Shopping List of FY<br>1985 & 1986<br><br>Discussion on Requested Items<br><br>Data Collection  |



| Date       | Contacted Agency   | W o r k  |
|------------|--|--|
| 4/ 4 (FRI) | Field Survey   | Drafting Minutes of Meeting<br>Comilla Site Survey   |
| 4/ 5 (SAT) | BRD  | Discussion on Minutes<br><br>Discussion on Further Study Schedule  |
| 4/ 6 (SUN) | BRD<br>Japanese Embassy<br>Field Survey                    | Signing Minutes of Meeting<br>Reporting Study Results<br>Narayanganj BADC Office<br><br>Team Leader and Experts of Cooperation<br>Planning (Departure of & Agricultural<br>Development planning) |
| 4/ 7 (MON) | DAB<br><br>BADC<br><br>Field Survey                        | Data Collection<br><br>Discussion on Requested Items for FY1985<br><br>Dhaka, Comilla  |
| 4/ 8 (TUE) | BARI<br><br>BRRI   | Data Collection<br><br>- do -  |
| 4/ 9 (WED) | Field Survey<br><br>BADC, MOF                              | Inspection of Comilla Office Workshop<br>of BADC<br>Data Collecction   |
| 4/10 (THU) | Field Survey<br><br>Suppliers of<br>Construction Materials | Faridpur<br><br>Interviewing   |
| 4/11 (FRI) | Field Survey<br><br>Field Survey                           | Faridpur<br><br>Kurigram   |
| 4/12 (SAT) | BADC<br><br>BBS  | Disussion on Sites of Floating Pumps<br><br>Data Collection  |
| 4/13 (SUN) | BADC<br><br>BWDB<br><br>Field Survey                       | Data Collection and Consolidation<br><br>Discussion on Requested Materials for<br>Kurigram Project<br><br>Pabna  |

| Date       | Contacted Agency   | Work   |
|------------|--|--|
| 4/14 (MON) | BWDB<br><br>BRD<br><br>DAE<br><br>Soil Resources<br>Development Institutes<br><br>Field Survey | Discussion on Requested Materials for<br>Kurigram Project<br><br>Discussion on Counterpart Fund<br><br>Data Collection of Agro-Chemicals<br><br>Data Collection<br><br>Pabna |
| 4/15 (TUE) | Field Survey   | Comilla<br><br>Data Consolidation  |
| 4/16 (WED) | ERD<br><br>BADC  | Discussion on Counterpart Fund<br><br>Discussion on Requested Items<br>Inspection of Fertilizer's Storage  |
| 4/17 (THU) | BADC<br><br>BWDB<br><br>ERD<br><br>Japanese Embassy  | Discussion on Fertilizer Request<br><br>Discussion on Requested Items<br><br>Reporting Study Results<br><br>Reporting Study Results  |
| 4/18 (FRI) | Travel   | Dhaka (T6322) → Bangkok  |
| 4/19 (SAT) | Travel   | Bangkok (T6640) → Tokyo  |

### 3. CONTACT LIST

#### EMBASSY OF JAPAN

|             |                  |
|-------------|------------------|
| Y. Tanaka   | Ambassador       |
| Y. Hayashi  | Minister         |
| K. Iwata    | Second Secretary |
| T. Sugimoto | Second Secretary |
| Y. Okada    | Second Secretary |

#### JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

|             |  |
|-------------|--|
| M. Ezaki    | Resident Representative                                    |
| M. Ishikawa | Vice Resident Representative                               |
| K. Egawa    | Deputy Resident Representative                             |
| K. Inoue    | JICA Expert  |
| T. Kato     | Japan Overseas Cooperation Volunteer<br>(JOCV) Coordinator |
| Y. Kakizaki | JOCV Mushroom Expert                                       |

#### EXTERNAL RESOURCES DIVISION, MINISTRY OF FINANCE

|                         |                  |
|-------------------------|------------------|
| Md. Akthar Ali          | Deputy Secretary |
| Md. Soakat Ali          | Deputy Chief     |
| M. A. Muktadir Mazumder | Assistant Chief  |
| Kamaluddin Ahmed        | Research Officer |

#### PLANNING COMMISSION, MINISTRY OF PLANNING

|                        |                              |
|------------------------|------------------------------|
| Dr. A. H. M. Altaf Ali | Division Chief (Agriculture) |
|------------------------|------------------------------|

#### MINISTRY OF AGRICULTURE

|                        |   |
|------------------------|---|
| Shah Ali Hossain       | Joint Secretary   |
| Mostafa Anwar Mohammed | Deputy secretary (Inputs)                                 |
| Abdur Aziz Sarker      | Senior Assistant Secretary                                |
| Mohammed Ali Jinnah    | Assistant Chief Engineer (PMU)                            |
| A. B. M. Siddique      | Assistant Economist                                       |
| A. R. Kharn            | Director, Plant Protection Division                       |
| A. Marec               | Deputy Director, Plant protection<br>Division             |
| A. K. M. Azad          | A.R.C.O., Plant Protection Division                       |
| M. Shahidul Islam      | Director General, Department of<br>Agricultural Extension |
| Hyder Ali              | Director, Agro-Economic Research                          |
| Md. Mosharraf Hossain  | Chief, Agro-Economic Research                             |

BANGLADESH AGRICULTURAL DEVELOPMENT Corporation (BADC)

|                       |   |
|-----------------------|---|
| A. T. M. Ahsanullah   | Member Director (Supply)  |
| Farrukh Ahamed        | Senior Manager (Supply)   |
| M. A. Kalam           | Chief Engineer (Irrigation)   |
| N. A. Majumder        | Financial Adviser   |
| Quazi Moazzam Hussain | Manager (Purchase)-II   |
| A. B. Siddique        | Manager (Purchase)-I  |
| Abdul Baten           | Deputy Manager (MSS)  |
| M. A. Mannan          | Dhaka Regional Manager  |
| Ashabuddin Mahamed    | Deputy Chief Engineer (Irrigation)                                      |
| Mihanur Rahman        | Chief Planning  |
| Rajab Ali             | Executive Engineer, Proper Xen of the Project Area                      |
| Md. Slafiul Alam      | Assistant Engineer, Daudkandi Zone                                      |
| Mozammel Karim        | Superintending Engineer, Daudkandi Zone                                 |
| Md. Shamsul Haque     | Executive Engineer (Irrigation),<br>Serajgang Resion-II                 |
| Khan Md. Abdur Rahman | Assistant Engineer (Irrigation)<br>Shazadpur Zone                       |
| Md. Ohidul Islam      | Senior Sub Assistant Engineer<br>(Irrigation), Shazadpur Unit           |
| M. A. Halim           | Superintending Engineer (Irrigation)<br>Pabna                           |
| Md. Ali Hayat Akhond  | Assistant Chief Engineer  |
| Faruque Ahamed        | Executive Engineer, Resional Workshop, Dhaka                            |
| Md. Abdullah-Al-Kafi  | Assistant Manager, Primary Distribution<br>Point (PDP), Narayanganj     |
| Md. Serajul Islam     | Superintending Engineer, Dhaka Circle                                   |
| Md. Mesh-ke Alam      | Executive Engineer (Irrigation)<br>Narayanganj Region                   |
| Md. Abdur Rahman      | Senior Sub Assistant Engineer<br>Bandar Unit                            |
| Md. Fazhet Rahman     | Assistant Engineer (Irrigation),<br>Madripur Zone                       |
| S. M. Atiar Rahman    | Senior Sub Assistant Engineer<br>(Irrigation), Muksudpur Unit Gopalgonj |
| A. Sattar             | Executive Engineer, Harukandi Paridpur                                  |

BANGLADESH WATER DEVELOPMENT BOARD (BWDB)

|                     |  |
|---------------------|--|
| Moshiur Rahman      | Chief Engineer, Mechanical Equipment Organization  |
| Amjhad Hossain Khan | Member Planning                                    |
| Md. Afazuddin       | Superintending Engineer, Teest Project             |
| S. Rahman           | Executive Engineer, North Unit of Kurigram Project |

MINISTRY OF IRRIGATION AND FLOOD CONTROL

|               |                     |
|---------------|---------------------|
| Khan Amer Ali | Deputy Secretary    |
| Shahin Khan   | Assistant Secretary |

MINISTRY OF FOOD

|                      |   |
|----------------------|---|
| I. U. Malik          | Joint Secretary                                       |
| A. K. M. Nurul Afsar | Director, Food Department                             |
| Md. Fakhrul Islam    | Deputy Director, Food Department Inspection & Control |

BANGLADESH BANK

|                  |  |
|------------------|--|
| Nizamuddin Ahmed | General Manager, exchange Control Department |
| Nazmul Hasan     | Deputy Director, Exchange Control Department |

THE WORLD BANK

|                   |                     |
|-------------------|---------------------|
| Peter W. Whitford | Head of Agriculture |
|-------------------|---------------------|

ASIAN DEVELOPMENT BANK (ADB)

|                     |                         |
|---------------------|-------------------------|
| Dr. Paul E. Kohling | Resident Representative |
| M. Horie            | Senior Project Engineer |

SOIL RESOURCES DEVELOPMENT INSTITUTE

|               |                |
|---------------|----------------|
| Rezaur Rahman | Director       |
| Fazle Ali     | Soil Scientist |

INTERNATIONAL FERTILIZER DEVELOPMENT CENTER (IFDC)

|                  |         |
|------------------|---------|
| Kenneth L. Moots | Manager |
|------------------|---------|

JAPAN EXTERNAL TRADE ORGANIZATION (JETRO)

|             |                |
|-------------|----------------|
| K. Tanigawa | Representative |
|-------------|----------------|

#### 4. DATA COLLECTED

1. 1984-85 Statistical Yearbook of Bangladesh, Bangladesh Bureau of Statistical (BBS)
2. Monthly Fertilizer Newsletter; July 1982, Bangladesh Agricultural Development Board (BADC)
3. Monthly Fertilizer Newsletter; June 1983, BADC
4. Monthly Fertilizer Newsletter; June 1984, BADC
5. Monthly Fertilizer Newsletter; June 1985, BADC
6. Monthly Fertilizer Newsletter; February 1986, BADC
7. Bangladesh Economic Survey 1984/85, Ministry of Finance Financial Division, Economic Advisers Division
8. Economic Indicators of Bangladesh, Jan. 1986, BBS
9. Pricing and Subsidy Policies for Bangladesh Agriculture, Aug. 1984, Bangladesh Institute of Development Studies, Dhaka
10. Monthly Statistical Bulletin of Bangladesh Jan. 1986, BBS
11. Bangladesh General Soil Map Scale 1:1,000,000
12. 1984-85 Yearbook of Agricultural Statistics of Bangladesh, BBS
13. 1982 Agricultural Yearbook of Bangladesh
14. Fertilizer Price Decontrol Study May 1984, Center for Development Science
15. Research Evaluation and Planning for a Five-Year Integrated Pest Management Plan for Bangladesh, Bangladesh Agricultural Research Council
16. Bangladesh Fertilizer Procurement Policy Mar. 1984, BADC International Agricultural Development Corporation
17. Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh, International Food Policy Research Institute

18. Lesson Plans on Agronomy II Part-I & II, The Training Division Department of Agricultural Extension
19. A Review of Results of the National Coordinated Cropping Systems Research Project in Bangladesh, BADC
20. Agricultural Production, Fertilizer Use and Equity Considerations, International Fertilizer Development Center
21. Crop Production Manual, Wheat, Bangladesh Agricultural Research Council
22. Fertilizer Pricing Policy and Foodgrain Production Strategy in Bangladesh, Technical Report, International Food Policy Research Institute
23. Food Situation Report for the Monthly of February, 1986 Food Planning and Monitoring Secretariat Food Division
24. Costs and Returns Survey for Bangladesh, Agro-Economic Research Section, Department of Agricultural Extension
25. Export from Bangladesh During the Fiscal Years 1972-73 to 1985-86, Export Promotion Bureau
26. Pest Monitoring and Surveillance in Bangladesh, Bangladesh Agricultural Research Council
27. Bangladesh The Gazrille Office of the Chief Controllor of Imports and Exports Order, Ministry of Commerce
28. Bangladesh The Gazrille Import Trade Control Order, Ministry of Commerce
29. The Third Five Year Plan 1985-90, Planning Commission, Ministry of Finance
30. Recommendation of the President to the Board of Directors and Appraisal of a Proposed Loan to the People's Republic of Bangladesh for a Fourth Crop Intensification Program, Asian Development Bank, 22 November, 1985
31. Joint Bangladesh and U.S. Government Evaluation of the Fertilizer Distribution Improvement Project, Ministry of Agriculture, U.S. Agency for International Development, November, 1982