

Table A-48 Economic Net Return per Hectare - With Project (1/6)

| Items                | Ashalmam          |                  |                 |                  |                       |                       | Weija            |                   |                        |                   |                      |                          |                       |                       |                         |        |
|----------------------|-------------------|------------------|-----------------|------------------|-----------------------|-----------------------|------------------|-------------------|------------------------|-------------------|----------------------|--------------------------|-----------------------|-----------------------|-------------------------|--------|
|                      | Paddy (Irrigated) | Okra (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) | Wet Paddy (Irrigated) | Dry Paddy (Irrigated) | Okra (Irrigated) | Tinda (Irrigated) | Hot Pepper (Irrigated) | Maize (Irrigated) | Tomatoes (Irrigated) | Cluster Bear (Irrigated) | R. Marrow (Irrigated) | L. Marrow (Irrigated) | S. Potatoes (Irrigated) |        |
|                      | Unit Price (CD)   | Unit Price (CD)  | Unit Price (CD) | Unit Price (CD)  | Unit Price (CD)       | Unit Price (CD)       | Unit Price (CD)  | Unit Price (CD)   | Unit Price (CD)        | Unit Price (CD)   | Unit Price (CD)      | Unit Price (CD)          | Unit Price (CD)       | Unit Price (CD)       | Unit Price (CD)         |        |
| 1. Gross Income      |                   |                  |                 |                  |                       |                       |                  |                   |                        |                   |                      |                          |                       |                       |                         |        |
| Unit Yield           | (t/ha)            | (t/ha)           | (t/ha)          | (t/ha)           | (t/ha)                | (t/ha)                | (t/ha)           | (t/ha)            | (t/ha)                 | (t/ha)            | (t/ha)               | (t/ha)                   | (t/ha)                | (t/ha)                | (t/ha)                  |        |
| Unit Price           | (CD/kg)           | (CD/kg)          | (CD/kg)         | (CD/kg)          | (CD/kg)               | (CD/kg)               | (CD/kg)          | (CD/kg)           | (CD/kg)                | (CD/kg)           | (CD/kg)              | (CD/kg)                  | (CD/kg)               | (CD/kg)               | (CD/kg)                 |        |
| Gross Income         | 1,810             | 3,480            | 3,480           | 3,480            | 1,810                 | 1,810                 | 2,400            | 8,280             | 4,800                  | 705               | 3,000                | 2,400                    | 6,000                 | 6,000                 | 2,340                   |        |
| 2. Production Cost   |                   |                  |                 |                  |                       |                       |                  |                   |                        |                   |                      |                          |                       |                       |                         |        |
| 1) Seed              | (kg)              | (kg)             | (kg)            | (kg)             | (kg)                  | (kg)                  | (kg)             | (kg)              | (kg)                   | (kg)              | (kg)                 | (kg)                     | (kg)                  | (kg)                  | (kg)                    | (kg)   |
| 2) Fertilizers       | (kg)              | (kg)             | (kg)            | (kg)             | (kg)                  | (kg)                  | (kg)             | (kg)              | (kg)                   | (kg)              | (kg)                 | (kg)                     | (kg)                  | (kg)                  | (kg)                    | (kg)   |
| - Compound           | 300               | 300              | 300             | 300              | 300                   | 300                   | 300              | 300               | 300                    | 300               | 300                  | 300                      | 300                   | 300                   | 300                     | 300    |
| - SA                 | 153               | 153              | 153             | 153              | 153                   | 153                   | 153              | 153               | 153                    | 153               | 153                  | 153                      | 153                   | 153                   | 153                     | 153    |
| - Urea               | 343               | 343              | 343             | 343              | 343                   | 343                   | 343              | 343               | 343                    | 343               | 343                  | 343                      | 343                   | 343                   | 343                     | 343    |
| 3) Agro Chemicals    |                   |                  |                 |                  |                       |                       |                  |                   |                        |                   |                      |                          |                       |                       |                         |        |
| - Herbicide          | (lit.)            | (lit.)           | (lit.)          | (lit.)           | (lit.)                | (lit.)                | (lit.)           | (lit.)            | (lit.)                 | (lit.)            | (lit.)               | (lit.)                   | (lit.)                | (lit.)                | (lit.)                  | (lit.) |
| - Basagran           | 5.0               | 5.0              | 5.0             | 5.0              | 5.0                   | 5.0                   | 5.0              | 5.0               | 5.0                    | 5.0               | 5.0                  | 5.0                      | 5.0                   | 5.0                   | 5.0                     | 5.0    |
| - Insecticide        | (lit.)            | (lit.)           | (lit.)          | (lit.)           | (lit.)                | (lit.)                | (lit.)           | (lit.)            | (lit.)                 | (lit.)            | (lit.)               | (lit.)                   | (lit.)                | (lit.)                | (lit.)                  | (lit.) |
| - Kraie 2.5E         | 3.0               | 3.0              | 3.0             | 3.0              | 3.0                   | 3.0                   | 3.0              | 3.0               | 3.0                    | 3.0               | 3.0                  | 3.0                      | 3.0                   | 3.0                   | 3.0                     | 3.0    |
| - Durshan 4 E        | 5.0               | 5.0              | 5.0             | 5.0              | 5.0                   | 5.0                   | 5.0              | 5.0               | 5.0                    | 5.0               | 5.0                  | 5.0                      | 5.0                   | 5.0                   | 5.0                     | 5.0    |
| - Furadan            | 5.0               | 5.0              | 5.0             | 5.0              | 5.0                   | 5.0                   | 5.0              | 5.0               | 5.0                    | 5.0               | 5.0                  | 5.0                      | 5.0                   | 5.0                   | 5.0                     | 5.0    |
| - Actellic           | (lit.)            | (lit.)           | (lit.)          | (lit.)           | (lit.)                | (lit.)                | (lit.)           | (lit.)            | (lit.)                 | (lit.)            | (lit.)               | (lit.)                   | (lit.)                | (lit.)                | (lit.)                  | (lit.) |
| - Fungicide          | (lit.)            | (lit.)           | (lit.)          | (lit.)           | (lit.)                | (lit.)                | (lit.)           | (lit.)            | (lit.)                 | (lit.)            | (lit.)               | (lit.)                   | (lit.)                | (lit.)                | (lit.)                  | (lit.) |
| - Topsion            | 3.0               | 3.0              | 3.0             | 3.0              | 3.0                   | 3.0                   | 3.0              | 3.0               | 3.0                    | 3.0               | 3.0                  | 3.0                      | 3.0                   | 3.0                   | 3.0                     | 3.0    |
| - Diahane M45        | 16                | 16               | 16              | 16               | 16                    | 16                    | 16               | 16                | 16                     | 16                | 16                   | 16                       | 16                    | 16                    | 16                      | 16     |
| - Kocide             | 3.0               | 3.0              | 3.0             | 3.0              | 3.0                   | 3.0                   | 3.0              | 3.0               | 3.0                    | 3.0               | 3.0                  | 3.0                      | 3.0                   | 3.0                   | 3.0                     | 3.0    |
| - Rodenticide        | (kg)              | (kg)             | (kg)            | (kg)             | (kg)                  | (kg)                  | (kg)             | (kg)              | (kg)                   | (kg)              | (kg)                 | (kg)                     | (kg)                  | (kg)                  | (kg)                    | (kg)   |
| - Yosodion           | 8                 | 8                | 8               | 8                | 8                     | 8                     | 8                | 8                 | 8                      | 8                 | 8                    | 8                        | 8                     | 8                     | 8                       | 8      |
| 4) Machinery Power   |                   |                  |                 |                  |                       |                       |                  |                   |                        |                   |                      |                          |                       |                       |                         |        |
| - Land preparation   | (ha)              | (ha)             | (ha)            | (ha)             | (ha)                  | (ha)                  | (ha)             | (ha)              | (ha)                   | (ha)              | (ha)                 | (ha)                     | (ha)                  | (ha)                  | (ha)                    | (ha)   |
| - Culting            | 95                | 95               | 95              | 95               | 95                    | 95                    | 95               | 95                | 95                     | 95                | 95                   | 95                       | 95                    | 95                    | 95                      | 95     |
| - Labour Requirement | (m-m)             | (m-m)            | (m-m)           | (m-m)            | (m-m)                 | (m-m)                 | (m-m)            | (m-m)             | (m-m)                  | (m-m)             | (m-m)                | (m-m)                    | (m-m)                 | (m-m)                 | (m-m)                   | (m-m)  |
| - Family Labour      | 39                | 39               | 39              | 39               | 39                    | 39                    | 39               | 39                | 39                     | 39                | 39                   | 39                       | 39                    | 39                    | 39                      | 39     |
| - Exchange           | 1                 | 1                | 1               | 1                | 1                     | 1                     | 1                | 1                 | 1                      | 1                 | 1                    | 1                        | 1                     | 1                     | 1                       | 1      |
| - Hired Labour       | 75                | 75               | 75              | 75               | 75                    | 75                    | 75               | 75                | 75                     | 75                | 75                   | 75                       | 75                    | 75                    | 75                      | 75     |
| 6) Miscellaneous     | (5%)              | (5%)             | (5%)            | (5%)             | (5%)                  | (5%)                  | (5%)             | (5%)              | (5%)                   | (5%)              | (5%)                 | (5%)                     | (5%)                  | (5%)                  | (5%)                    | (5%)   |
| Total                | 742               | 655              | 174             | 165              | 602                   | 602                   | 586              | 419               | 712                    | 197               | 476                  | 414                      | 482                   | 482                   | 391                     | 391    |
| 4 Net Return         | 1,068             | 2,825            | 531             | 285              | 1,208                 | 1,208                 | 1,814            | 7,861             | 4,088                  | 508               | 2,524                | 1,986                    | 5,518                 | 5,518                 | 1,949                   | 1,949  |

**Table A-48 Economic Net Return per Hectare - With Project (2/6)**

| Items                 | Amate            |                      |                   |                 |                  |                       | Affe                  |                  |                       |                       |                  |  |
|-----------------------|------------------|----------------------|-------------------|-----------------|------------------|-----------------------|-----------------------|------------------|-----------------------|-----------------------|------------------|--|
|                       | Okra (Irrigated) | Tomatoes (Irrigated) | Onion (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) | Wet Paddy (Irrigated) | Dry Paddy (Irrigated) | Okra (Irrigated) | Wet Paddy (Irrigated) | Dry Paddy (Irrigated) | Okra (Irrigated) |  |
| 1. Gross Income       |                  |                      |                   |                 |                  |                       |                       |                  |                       |                       |                  |  |
| Unit Yield            | 12.0             | 14.0                 | 18.0              | 3.0             | 1.5              | (t/ha)                | 5.5                   | 5.5              | 5.5                   | 12.0                  |                  |  |
| Unit Price (CD/kg)    | 200              | 380                  | 650               | 235             | 300              | (CD/kg)               | 329                   | 329              | 329                   | 500                   |                  |  |
| Gross Income          | 2,400            | 5,320                | 11,700            | 705             | 450              | (CD)                  | 1,810                 | 1,810            | 1,810                 | 6,000                 |                  |  |
| 2. Production Cost    |                  |                      |                   |                 |                  |                       |                       |                  |                       |                       |                  |  |
| 1) Seed               | 10               | 3                    | 12                | 25              | 6                | (kg)                  | 100                   | 33               | 100                   | 33                    | 4                |  |
| 2) Fertilizers        | 300              | 114                  | 300               | 150             | 43               | (kg)                  | 400                   | 114              | 400                   | 114                   | 300              |  |
| - Compound            | 300              | 46                   | 250               | 125             | 19               | (kg)                  | 200                   | 69               | 200                   | 69                    | 300              |  |
| - SA                  | -                | -                    | -                 | -               | -                | (kg)                  | -                     | -                | -                     | -                     | 46               |  |
| - Urea                | -                | -                    | -                 | -               | -                | (kg)                  | -                     | -                | -                     | -                     | -                |  |
| 3) Agro Chemicals     |                  |                      |                   |                 |                  |                       |                       |                  |                       |                       |                  |  |
| - Herbicide           | -                | -                    | -                 | -               | -                | (lit.)                | 5.0                   | 39               | 5.0                   | 39                    | -                |  |
| Basagran              | -                | -                    | -                 | -               | -                | (lit.)                | -                     | -                | -                     | -                     | -                |  |
| - Insecticide         | -                | 49                   | -                 | 2.5             | 49               | (lit.)                | 3.0                   | 47               | 3.0                   | 47                    | -                |  |
| Krate 2.5E            | -                | -                    | -                 | -               | -                | (lit.)                | -                     | -                | -                     | -                     | -                |  |
| Dursban 4 E           | -                | -                    | -                 | -               | -                | (kg)                  | -                     | -                | -                     | -                     | -                |  |
| Furadan               | -                | -                    | -                 | -               | -                | (lit.)                | -                     | -                | -                     | -                     | 64               |  |
| Actellic              | 5.0              | 64                   | 2.5               | -               | -                | (lit.)                | -                     | -                | -                     | -                     | -                |  |
| - Fungicide           | -                | -                    | -                 | -               | -                | (kg)                  | -                     | -                | -                     | -                     | -                |  |
| Topsion               | 3.0              | 12                   | 2.0               | -               | -                | (kg)                  | -                     | -                | -                     | -                     | 14               |  |
| Diathane M45          | -                | -                    | -                 | -               | -                | (kg)                  | -                     | -                | -                     | -                     | -                |  |
| Kocide                | -                | -                    | -                 | -               | -                | (kg)                  | -                     | -                | -                     | -                     | -                |  |
| - Rodenticide         | 1.0              | -                    | -                 | -               | -                | (kg)                  | 5.0                   | 39               | 5.0                   | 39                    | 1.0              |  |
| Yosodion              | -                | -                    | -                 | -               | -                | (kg)                  | -                     | -                | -                     | -                     | 8                |  |
| 4) Machinery Power    |                  |                      |                   |                 |                  |                       |                       |                  |                       |                       |                  |  |
| - Land preparation    | 2.0              | 54                   | 2.5               | 2.0             | 43               | (ha)                  | 2.0                   | 43               | 2.0                   | 43                    | 1.0              |  |
| - Carving             | 215              | -                    | 346               | 83              | -                | (bag)                 | 132                   | -                | 132                   | -                     | 154              |  |
| 5) Labour Requirement |                  |                      |                   |                 |                  |                       |                       |                  |                       |                       |                  |  |
| - Family Labour       | 50               | 88                   | 119               | 21              | 36               | (m-m)                 | 28                    | 49               | 28                    | 49                    | 36               |  |
| - Exchange            | 93               | 163                  | 90                | 62              | 36               | (m-m)                 | 5                     | 9                | 5                     | 9                     | 207              |  |
| - Hired Labour        | 72               | 126                  | 137               | 15              | 12               | (m-m)                 | 99                    | 173              | 99                    | 173                   | 26               |  |
| 6) Miscellaneous      | 32               | 35                   | 71                | 15              | 15               | (5%)                  | 31                    | 31               | 31                    | 31                    | 26               |  |
| Total                 | 679              | 735                  | 1,482             | 321             | 245              |                       | 646                   | 646              | 646                   | 646                   | 554              |  |
| 4. Net Return         | 1,721            | 4,585                | 10,218            | 384             | 205              |                       | 1,164                 | 1,164            | 1,164                 | 1,164                 | 5,446            |  |

Table A-48 Economic Net Return per Hectare - With Project (3/6)

| Items                 | Aveyime               |                       |                 |                  |                      |                  |                   |                  |                      |                   | Kpando-Torkor   |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
|-----------------------|-----------------------|-----------------------|-----------------|------------------|----------------------|------------------|-------------------|------------------|----------------------|-------------------|-----------------|------------------|-----------------------|-----------------------|-----------------|------------------|----------------------|------------------|-------------------|-----------------|------------------|------|------------|-----------------|-----|-----|
|                       | Wet Paddy (Irrigated) | Dry Paddy (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) | Tomatoes (Irrigated) | Okra (Irrigated) | Onion (Irrigated) | Okra (Irrigated) | Tomatoes (Irrigated) | Onion (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) | Wet Paddy (Irrigated) | Dry Paddy (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) | Tomatoes (Irrigated) | Okra (Irrigated) | Onion (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) |      |            |                 |     |     |
|                       | Unit                  | Qty                   | Price (CD)      | Value (CD1,000)  | Qty                  | Value (CD1,000)  | Unit              | Price (CD)       | Value (CD1,000)      | Qty               | Value (CD1,000) | Unit             | Price (CD)            | Value (CD1,000)       | Qty             | Value (CD1,000)  | Unit                 | Price (CD)       | Value (CD1,000)   | Qty             | Value (CD1,000)  | Unit | Price (CD) | Value (CD1,000) |     |     |
| 1. Gross Income       |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| Unit Yield            | (t/ha)                | 5.5                   |                 | 5.5              | 1.5                  | 12.0             |                   | 18.0             | 12.0                 | 18.0              | 12.0            |                  | 14.0                  | 12.0                  | 18.0            | 12.0             |                      | 14.0             | 18.0              | 12.0            | 18.0             | 3.0  |            | 3.0             | 1.5 |     |
| Unit Price            | (CD/kg)               | 329                   |                 | 329              | 480                  | 200              |                   | 180              | 480                  | 180               | 200             |                  | 480                   | 200                   | 480             | 200              |                      | 480              | 180               | 200             | 480              | 235  |            | 235             | 300 |     |
| Gross Income          | (CD)                  | 1,810                 |                 | 1,810            | 6,720                | 2,400            |                   | 3,240            | 6,720                | 2,400             | 2,400           |                  | 6,720                 | 2,400                 | 6,720           | 2,400            |                      | 6,720            | 8,640             | 6,000           | 8,640            | 705  |            | 705             | 450 |     |
| 2. Production Cost    |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| 1) Seed               | (kg)                  | 100                   | 33              | 3,300            | 15                   | 39               | (kg)              | 394              | 5,910                | 11                | 4,334           | (kg)             | 394                   | 15,394                | 24              | 9,456            | (kg)                 | 394              | 15,394            | 24              | 9,456            | 6    |            | 6               | 15  |     |
| 2) Fertilizers        |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Compound            | (kg)                  | 400                   | 114             | 45,600           | 400                  | 45,600           | (kg)              | 284              | 113,600              | 300               | 85,200          | (kg)             | 284                   | 85,200                | 300             | 85,200           | (kg)                 | 284              | 85,200            | 300             | 85,200           | 150  |            | 150             | 43  |     |
| - SA                  | (kg)                  |                       |                 |                  | 300                  | 46,200           | (kg)              | 153              | 45,900               | 300               | 46,200          | (kg)             | 153                   | 45,900                | 300             | 46,200           | (kg)                 | 153              | 45,900            | 300             | 46,200           | 38   |            | 38              | 19  |     |
| - Urea                | (kg)                  | 200                   | 69              | 13,800           |                      |                  | (kg)              | 343              | 23,760               |                   |                 | (kg)             | 343                   | 23,760                |                 |                  | (kg)                 | 343              | 23,760            |                 |                  |      |            |                 |     |     |
| 3) Agro Chemicals     |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Herbicide           | (lit.)                | 5.0                   | 59              | 295              |                      |                  | (lit.)            |                  |                      |                   |                 | (lit.)           |                       |                       |                 |                  | (lit.)               |                  |                   |                 |                  |      |            |                 |     |     |
| - Basagran            |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Insecticide         | (lit.)                | 3.0                   | 59              | 177              | 2.5                  | 49               | (lit.)            | 19,500           | 49                   | 2.5               | 49              | (lit.)           | 19,500                | 49                    | 2.5             | 49               | (lit.)               | 19,500           | 49                | 2.5             | 49               | 2.5  |            | 2.5             | 49  | 2.5 |
| - Krate 2.5E          |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Dursban 4 E         | (lit.)                |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Furadan             | (kg)                  |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Actelic             | (lit.)                |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Fungicide           |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Topsion             | (lit.)                |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Diathane M45        | (kg)                  |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Kocide              | (kg)                  |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Rodenticide         | (kg)                  |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Yosodion            |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| 4) Machinery Power    |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Land preparation    | (ha)                  | 3.0                   | 64              | 192              | 2.0                  | 43               | (ha)              | 21,450           | 43                   | 2.0               | 43              | (ha)             | 21,450                | 43                    | 2.0             | 43               | (ha)                 | 21,450           | 43                | 2.0             | 43               | 2.0  |            | 2.0             | 43  | 2.0 |
| - Carting             | (bag)                 | 124                   | 281             | 34,844           |                      |                  | (bag)             | 281              | 281                  |                   |                 | (bag)            | 281                   | 281                   |                 |                  | (bag)                | 281              | 281               |                 |                  |      |            |                 |     |     |
| 5) Labour Requirement |                       |                       |                 |                  |                      |                  |                   |                  |                      |                   |                 |                  |                       |                       |                 |                  |                      |                  |                   |                 |                  |      |            |                 |     |     |
| - Family Labour       | (m-m)                 | 39                    | 60              | 2,340            | 36                   | 55               | (m-m)             | 1,540            | 55                   | 72                | 108             | (m-m)            | 1,540                 | 108                   | 165             | 252              | (m-m)                | 1,540            | 108               | 165             | 252              | 83   |            | 83              | 72  |     |
| - Exchange            | (m-m)                 | 2                     | 3               | 6                | 13                   | 20               | (m-m)             | 1,470            | 69                   | 8                 | 12              | (m-m)            | 1,470                 | 12                    | 17              | 25               | (m-m)                | 1,470            | 12                | 17              | 25               | 21   |            | 21              | 36  |     |
| - Hired Labour        | (m-m)                 | 83                    | 128             | 10,624           | 65                   | 100              | (m-m)             | 1,470            | 331                  | 116               | 179             | (m-m)            | 1,470                 | 179                   | 250             | 365              | (m-m)                | 1,470            | 179               | 250             | 365              | 62   |            | 62              | 91  |     |
| - Miscellaneous (5%)  | (5%)                  | 31                    | 31              | 99               | 11                   | 11               | (5%)              |                  | 58                   | 35                | 35              | (5%)             |                       | 58                    | 35              | 35               | (5%)                 |                  | 58                | 35              | 35               | 14   |            | 14              | 11  |     |
| Total                 |                       | 659                   | 559             | 4,338            | 228                  | 725              |                   | 1,217            | 578                  | 725               | 725             |                  | 1,217                 | 725                   | 725             | 725              |                      | 1,217            | 578               | 725             | 725              | 998  |            | 998             | 224 |     |
| 4. Net Return         |                       | 1,151                 | 1,151           | 398              | 222                  | 1,675            |                   | 2,023            | 6,142                | 1,675             | 1,675           |                  | 6,142                 | 1,675                 | 1,675           | 1,675            |                      | 6,142            | 6,165             | 5,002           | 6,165            | 409  |            | 409             | 226 |     |

**Table A-48 Economic Net Return per Hectare - With Project (4/6)**

| Items                       | Mankessim              |                       |                  |                 |                  |                       | Akumadan             |                  |                        |                 |                  |  |
|-----------------------------|------------------------|-----------------------|------------------|-----------------|------------------|-----------------------|----------------------|------------------|------------------------|-----------------|------------------|--|
|                             | Watermelon (Irrigated) | Egg Plant (Irrigated) | Okra (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) | S. Potatoes (Rainfed) | Tomatoes (Irrigated) | Okra (Irrigated) | Watermelon (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) |  |
| 1. Gross Income             |                        |                       |                  |                 |                  |                       |                      |                  |                        |                 |                  |  |
| Unit Yield (t/ha)           | 15.0                   | 15.0                  | 12.0             | 3.0             | 1.5              | 20.0                  | 14.0                 | 12.0             | 15.0                   | 3.0             | 1.5              |  |
| Unit Price (CD/kg)          | 240                    | 230                   | 300              | 235             | 300              | 200                   | 480                  | 300              | 240                    | 235             | 300              |  |
| Gross Income (CD)           | 3,600                  | 3,450                 | 3,600            | 705             | 450              | 4,000                 | 6,720                | 3,600            | 3,600                  | 705             | 450              |  |
| 2. Production Cost          |                        |                       |                  |                 |                  |                       |                      |                  |                        |                 |                  |  |
| 1) Seed (kg)                | 1                      | 0.5                   | 2.2              | 6               | 50               | 375                   | 0.3                  | 8.0              | 1.0                    | 27              | 6                |  |
| 2) Fertilizers (kg)         | 300                    | 300                   | 300              | 150             | 43               | 100                   | 400                  | 300              | 300                    | 150             | 43               |  |
| - Compound (kg)             | 250                    | 300                   | 300              | 125             | 19               | -                     | 300                  | 300              | 250                    | 38              | 19               |  |
| - SA (kg)                   | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Urea (kg)                 | 343                    | -                     | -                | -               | -                | -                     | 343                  | -                | -                      | -               | -                |  |
| 3) Agro Chemicals (lit.)    | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Herbicide (lit.)          | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Basagran (lit.)           | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Insecticide (lit.)        | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Krate 2.5E (lit.)         | 2.5                    | 2.5                   | 2.5              | 2.5             | 2.5              | 2.5                   | 2.5                  | 2.5              | 2.5                    | 2.5             | 2.5              |  |
| - Dursban 4 E (lit.)        | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Furadan (kg)              | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Actellic (lit.)           | -                      | -                     | -                | -               | -                | -                     | -                    | 5.0              | -                      | -               | -                |  |
| - Fungicide (kg)            | -                      | -                     | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Topsion (kg)              | -                      | -                     | -                | -               | -                | -                     | -                    | -                | 12                     | -               | -                |  |
| - Diathane M45 (kg)         | -                      | -                     | -                | -               | -                | -                     | -                    | 3.0              | -                      | -               | -                |  |
| - Kocide (kg)               | 5.0                    | 5.0                   | 3.0              | -               | -                | -                     | 13                   | 3.0              | -                      | -               | -                |  |
| - Rodenticide (kg)          | 7,800                  | 7,800                 | -                | -               | -                | -                     | -                    | -                | -                      | -               | -                |  |
| - Yosodion (kg)             | -                      | -                     | 8                | -               | -                | -                     | -                    | 1.0              | 8                      | -               | -                |  |
| 4) Machinery Power (ha)     | 21,450                 | 21,450                | 21,450           | 21,450          | 21,450           | 21,450                | 21,450               | 21,450           | 21,450                 | 21,450          | 21,450           |  |
| - Land preparation (bag)    | 281                    | 281                   | 281              | 281             | 281              | 281                   | 281                  | 281              | 281                    | 281             | 281              |  |
| - Carting (m-m)             | 147                    | 192                   | 344              | 129             | 72               | 90                    | 225                  | 255              | 147                    | 84              | 72               |  |
| 5) Labour Requirement (m-m) | 87                     | 92                    | 233              | 53              | 36               | 57                    | 110                  | 131              | 87                     | 42              | 36               |  |
| - Family Labour (m-m)       | 1                      | -                     | 28               | 3               | 4                | -                     | 1                    | 8                | 1                      | 2               | -                |  |
| - Exchange (m-m)            | 83                     | 100                   | 116              | 73              | 36               | 33                    | 114                  | 116              | 59                     | 103             | 36               |  |
| - Hired Labour (5%)         | 23                     | 26                    | 37               | 16              | 9                | 14                    | 33                   | 36               | 25                     | 15              | 11               |  |
| 6) Miscellaneous            | 490                    | 551                   | 777              | 336             | 196              | 290                   | 690                  | 765              | 528                    | 315             | 236              |  |
| Total                       | 3,110                  | 2,899                 | 2,823            | 369             | 254              | 3,710                 | 6,030                | 2,835            | 3,072                  | 390             | 214              |  |
| 4. Net Return               |                        |                       |                  |                 |                  |                       |                      |                  |                        |                 |                  |  |

**Table A-48 Economic Net Return per Hectare - With Project (5/6)**

| Items                 | Tanoso               |                     |                        |                     |                     | Bontanga              |                       |                  |                      |                       |                     |                 |                     |
|-----------------------|----------------------|---------------------|------------------------|---------------------|---------------------|-----------------------|-----------------------|------------------|----------------------|-----------------------|---------------------|-----------------|---------------------|
|                       | Tomatoes (Irrigated) | Okra (Irrigated)    | Watermelon (Irrigated) | Maize (Rainfed)     | Cowpea (Rainfed)    | Wet Paddy (Irrigated) | Dry Paddy (Irrigated) | Okra (Irrigated) | Tomatoes (Irrigated) | Egg Plant (Irrigated) | Onion (Irrigated)   | Maize (Rainfed) | Cowpea (Rainfed)    |
|                       | Unit Price (CD)      | Qty Value (CD1,000) | Unit Price (CD)        | Qty Value (CD1,000) | Qty Value (CD1,000) | Unit Price (CD)       | Qty Value (CD1,000)   | Unit Price (CD)  | Qty Value (CD1,000)  | Unit Price (CD)       | Qty Value (CD1,000) | Unit Price (CD) | Qty Value (CD1,000) |
| 1. Gross Income       |                      |                     |                        |                     |                     |                       |                       |                  |                      |                       |                     |                 |                     |
| Unit Yield            | (t/ha)               | 14.0                | 12.0                   | 15.0                | 3.0                 | 1.5                   | 5.5                   | (t/ha)           | 12.0                 | 14.0                  | 18.0                | 3.0             | 1.5                 |
| Unit Price            | (CD/kg)              | 480                 | 270                    | 240                 | 235                 | 300                   | 329                   | (CD/kg)          | 130                  | 125                   | 180                 | 235             | 300                 |
| Gross Income          | (CD)                 | 6,720               | 3,240                  | 3,600               | 705                 | 450                   | 1,810                 | (CD)             | 1,800                | 1,750                 | 3,240               | 705             | 450                 |
| 2. Production Cost    |                      |                     |                        |                     |                     |                       |                       |                  |                      |                       |                     |                 |                     |
| 1) Seed               | (kg)                 | 1.0                 | 8.0                    | 1.0                 | 27                  | 6                     | 100                   | (kg)             | 8                    | 1.0                   | 20                  | 25              | 6                   |
| 2) Fertilizers        |                      |                     |                        |                     |                     |                       |                       |                  |                      |                       |                     |                 |                     |
| - Compound            | (kg)                 | 284                 | 300                    | 85                  | 300                 | 43                    | 400                   | (kg)             | 85                   | 400                   | 300                 | 85              | 300                 |
| - SA                  | (kg)                 | 153                 | 300                    | 46                  | 250                 | 19                    | 300                   | (kg)             | 46                   | 300                   | 46                  | 300             | 46                  |
| - Urea                | (kg)                 | 343                 | -                      | -                   | -                   | -                     | 200                   | (kg)             | 69                   | -                     | -                   | -               | -                   |
| 3) Agro Chemicals     |                      |                     |                        |                     |                     |                       |                       |                  |                      |                       |                     |                 |                     |
| - Herbicide           | (lit.)               | -                   | -                      | -                   | -                   | -                     | 39                    | (lit.)           | 7,800                | 5.0                   | 39                  | -               | -                   |
| - Basagran            | (lit.)               | 15,600              | -                      | -                   | -                   | 39                    | 37                    | (lit.)           | 12,480               | 3.0                   | 37                  | -               | -                   |
| - Insecticide         | (lit.)               | -                   | -                      | -                   | -                   | -                     | -                     | (lit.)           | -                    | -                     | -                   | -               | -                   |
| - Krat 2.5E           | (kg)                 | -                   | -                      | -                   | -                   | -                     | -                     | (kg)             | -                    | -                     | -                   | -               | -                   |
| - Durshan 4 E         | (kg)                 | -                   | -                      | -                   | -                   | -                     | -                     | (kg)             | -                    | -                     | -                   | -               | -                   |
| - Furadan             | (lit.)               | 9,360               | 5.0                    | 47                  | -                   | -                     | -                     | (lit.)           | 11,700               | 5.0                   | 59                  | -               | -                   |
| - Actelic             | (lit.)               | -                   | -                      | -                   | -                   | -                     | -                     | (lit.)           | -                    | -                     | -                   | -               | -                   |
| - Fungicide           | (kg)                 | 5,460               | -                      | 14                  | -                   | -                     | -                     | (kg)             | 4,680                | -                     | -                   | -               | -                   |
| - Topsion             | (kg)                 | 5,304               | 3.0                    | 16                  | -                   | -                     | -                     | (kg)             | -                    | -                     | -                   | -               | -                   |
| - Diathane M45        | (kg)                 | -                   | -                      | -                   | -                   | -                     | -                     | (kg)             | -                    | -                     | -                   | -               | -                   |
| - Kocide              | (kg)                 | -                   | -                      | -                   | -                   | -                     | -                     | (kg)             | -                    | -                     | -                   | -               | -                   |
| - Rodenticide         | (kg)                 | 7,800               | 1.0                    | 8                   | -                   | -                     | -                     | (kg)             | 7,800                | 5.0                   | 39                  | 1.0             | 8                   |
| - Yosodion            | (kg)                 | -                   | -                      | -                   | -                   | -                     | -                     | (kg)             | -                    | -                     | -                   | -               | -                   |
| 4) Machinery Power    |                      |                     |                        |                     |                     |                       |                       |                  |                      |                       |                     |                 |                     |
| - Land preparation    | (ha)                 | 21,450              | 2.0                    | 43                  | 2.0                 | 43                    | 3.0                   | (ha)             | 21,450               | 3.0                   | 64                  | 2.0             | 43                  |
| - Carting             | (bag)                | 281                 | -                      | -                   | -                   | -                     | 128                   | (bag)            | 281                  | -                     | -                   | -               | -                   |
| 5) Labour Requirement |                      |                     |                        |                     |                     |                       |                       |                  |                      |                       |                     |                 |                     |
| - Family Labour       | (m-m)                | 1,470               | 162                    | 193                 | 87                  | 128                   | 38                    | (m-m)            | 770                  | 206                   | 379                 | 91              | 106                 |
| - Exchange            | (m-m)                | 1,470               | 106                    | 131                 | 24                  | 36                    | 29                    | (m-m)            | 90                   | 90                    | 86                  | 59              | 45                  |
| - Hired Labour        | (m-m)                | 1,470               | 8                      | 12                  | 1                   | 3                     | 5                     | (m-m)            | 4                    | 4                     | 2                   | 2               | 2                   |
| - Miscellaneous       | (5%)                 | 1,470               | 56                     | 82                  | 116                 | 81                    | 85                    | (5%)             | 112                  | 112                   | 293                 | 30              | 23                  |
| Total                 |                      |                     |                        |                     |                     |                       |                       |                  |                      |                       |                     |                 |                     |
|                       |                      | 539                 | 693                    | 485                 | 311                 | 213                   | 518                   |                  | 496                  | 445                   | 731                 | 223             | 179                 |
| 4. Net Return         |                      | 6,181               | 2,547                  | 3,115               | 394                 | 237                   | 1,292                 |                  | 1,304                | 1,305                 | 2,509               | 482             | 271                 |

**Table A-48 Economic Net Return per Hectare - With Project (6/6)**

| Items                 | Subinja               |                        |                  |                        |                 |                  | Okyereko              |                       |                      |                  |                   |                   |                    |
|-----------------------|-----------------------|------------------------|------------------|------------------------|-----------------|------------------|-----------------------|-----------------------|----------------------|------------------|-------------------|-------------------|--------------------|
|                       | Egg Plant (Irrigated) | Hot Pepper (Irrigated) | Okra (Irrigated) | Watermelon (Irrigated) | Maize (Rainfed) | Cowpea (Rainfed) | Wet Paddy (Irrigated) | Dry Paddy (Irrigated) | Tomatoes (Irrigated) | Okra (Irrigated) | Onion (Irrigated) | Maize (Irrigated) | Cowpea (Irrigated) |
| 1. Gross Income       |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Unit Yield            | 15.0                  | 3.0                    | 12.0             | 15.0                   | 3.0             | 1.5              | 5.5                   | 5.5                   | 14.0                 | 12.0             | 18.0              | 3.0               | 1.5                |
| Unit Price            | 230                   | 1,610                  | 300              | 240                    | 235             | 300              | 329                   | 329                   | 200                  | 300              | 415               | 235               | 300                |
| Gross Income          | 3,450                 | 4,830                  | 3,600            | 3,600                  | 705             | 450              | 1,810                 | 1,810                 | 2,800                | 3,600            | 7,470             | 705               | 450                |
| 2. Production Cost    |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| 1) Seed               | 0.4                   | 6                      | 2.2              | 1                      | 2.5             | 6                | 33                    | 100                   | 1                    | 8                | 39                | 25                | 6                  |
| 2) Fertilizers        |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| - Compound            | 300                   | 300                    | 300              | 85                     | 300             | 85               | 400                   | 400                   | 114                  | 300              | 85                | 300               | 85                 |
| - SA                  | 300                   | 46                     | 300              | 46                     | 300             | 46               | 200                   | 200                   | 300                  | 46               | 250               | 38                | 125                |
| - Urea                |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| 3) Agro Chemicals     |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| - Herbicide           |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Basagran              |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Insecticide           | 2.5                   | 39                     | 2.5              | 39                     | 2.5             | 39               | 47                    | 3.0                   | 2.5                  | 39               |                   | 2.5               | 39                 |
| Krate 2.5E            |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Dursban 4 E           |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Furadan               |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Acetic                |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Fungicide             |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Topsion               | 2.5                   | 12                     | 3.0              | 23                     |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Diathane M45          |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Kocide                |                       | 1.5                    | 12               | 2.5                    |                 |                  |                       |                       | 2.5                  | 12               | 2.0               |                   |                    |
| Rodenticide           |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Yosodion              |                       | 2.0                    | 16               | 8                      |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| 4) Machinery Power    |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| - Land preparation    | 2.0                   | 43                     | 2.0              | 43                     | 2.0             | 43               | 64                    | 3.0                   | 2.5                  | 54               | 43                | 2.0               | 43                 |
| - Carting             |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| 5) Labour Requirement |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| - Family Labour       | 422                   | 349                    | 255              | 147                    | 73              | 58               | 137                   | 137                   | 80                   | 255              | 363               | 124               | 72                 |
| - Exchange            | 285                   | 184                    | 131              | 87                     | 18              | 14               | 43                    | 75                    | 63                   | 110              | 103               | 89                | 36                 |
| - Hired Labour        | 137                   | 161                    | 116              | 59                     | 53              | 44               | 94                    | 165                   | 17                   | 30               | 215               | 35                | 61                 |
| 6) Miscellaneous      |                       |                        |                  |                        |                 |                  |                       |                       |                      |                  |                   |                   |                    |
| Miscellaneous         | 770                   | 711                    | 602              | 440                    | 248             | 174              | 698                   | 698                   | 441                  | 782              | 1,298             | 385               | 234                |
| 4. Net Return.        | 2,680                 | 4,119                  | 2,998            | 3,160                  | 457             | 276              | 1,112                 | 1,112                 | 2,359                | 2,818            | 6,172             | 320               | 216                |

**Table A-49 Economic Benefits (1/2)**

| Projects                                     | Ashaiman  |                         |                          | Weija     |                         |                          | Amate     |                         |                          | Afife     |                         |                          | Aveyime   |                         |                          | Kpando-Torkor |                         |                          |
|--|-----------|-------------------------|--------------------------|-----------|-------------------------|--------------------------|-----------|-------------------------|--------------------------|-----------|-------------------------|--------------------------|-----------|-------------------------|--------------------------|---------------|-------------------------|--------------------------|
|  | Area (ha) | N.R. (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha) | N.R. (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha) | N.R. (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha) | N.R. (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha) | N.R. (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha)     | N.R. (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) |
| <b>1. Land Use</b>                           |           |                         |                          |           |                         |                          |           |                         |                          |           |                         |                          |           |                         |                          |               |                         |                          |
| (1) Present                                  | 148       |                         |                          | 220       |                         |                          | 203       |                         |                          | 880       |                         |                          | 150       |                         |                          | 356           |                         |                          |
| Developed                                    | 130       |                         |                          | 220       |                         |                          | 101       |                         |                          | 880       |                         |                          | 63        |                         |                          | 40            |                         |                          |
| Undeveloped                                  | 18        |                         |                          | -         |                         |                          | 102       |                         |                          | -         |                         |                          | 87        |                         |                          | 316           |                         |                          |
| (2) Without Project                          | 148       |                         |                          | 220       |                         |                          | 203       |                         |                          | 880       |                         |                          | 150       |                         |                          | 356           |                         |                          |
| Developed                                    | 130       |                         |                          | 220       |                         |                          | 101       |                         |                          | 880       |                         |                          | 63        |                         |                          | 40            |                         |                          |
| Undeveloped                                  | 18        |                         |                          | -         |                         |                          | 102       |                         |                          | -         |                         |                          | 87        |                         |                          | 316           |                         |                          |
| (3) With Project                             | 148       |                         |                          | 220       |                         |                          | 203       |                         |                          | 880       |                         |                          | 150       |                         |                          | 356           |                         |                          |
| Irrigated                                    | 44        |                         |                          | 220       |                         |                          | 203       |                         |                          | 535       |                         |                          | 150       |                         |                          | 356           |                         |                          |
| Undeveloped                                  | 104       |                         |                          | -         |                         |                          | -         |                         |                          | 345       |                         |                          | -         |                         |                          | -             |                         |                          |
| <b>2. Benefit Without Project</b>            | 66.2      | 54                      |                          | 323.3     | 697                     |                          | 176.5     | 263                     |                          | 694.6     | 752                     |                          | 68.2      | 14                      |                          | 75.6          | 78                      |                          |
| (1) Developed Area                           | 59.0      |                         |                          | 323.3     |                         |                          | 85.2      |                         |                          | 694.6     |                         |                          | 28.7      |                         |                          | 13.0          |                         |                          |
| Irrigated                                    | 59.0      |                         |                          | 323.3     |                         |                          | 85.2      |                         |                          | 694.6     |                         |                          | -         |                         |                          | 13.0          |                         |                          |
| Okra   | 19.3      | 1,214                   | 23                       | 53.5      | 1,264                   | 68                       | -         | -                       | -                        | 40.0      | 4,469                   | 179                      | -         | -                       | -                        | 13.0          | 3,892                   | 51                       |
| Tomatoes                                     | -         | -                       | -                        | 19.6      | 1,126                   | 22                       | 41.2      | 1,399                   | 58                       | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Egg Plant                                    | -         | -                       | -                        | *         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Onion  | -         | -                       | -                        | *         | -                       | -                        | 40.0      | 3,940                   | 158                      | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Water melon                                  | -         | -                       | -                        | *         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Hot Pepper                                   | -         | -                       | -                        | 27.9      | 740                     | 21                       | 4.0       | 1,126                   | 5                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Tinda  | -         | -                       | -                        | 43.9      | 6,429                   | 282                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Cluster bean                                 | -         | -                       | -                        | 26.8      | 1,565                   | 42                       | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Paddy  | 39.7      | 773                     | 31                       | 62.5      | 741                     | 46                       | -         | -                       | -                        | 654.6     | 876                     | 573                      | -         | -                       | -                        | -             | -                       | -                        |
| Maize  | -         | -                       | -                        | *         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Sweet potatoes                               | -         | -                       | -                        | 11.4      | 1,907                   | 22                       | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Others                                       | -         | -                       | -                        | 77.7      | 2,495                   | 194                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Rainfed                                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | 28.7      | -                       | -                        | -             | -                       | -                        |
| Cassava                                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | 13.3      | 447                     | 6                        | -             | -                       | -                        |
| Yam  | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Sweet Potatoes                               | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Maize  | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | 15.4      | 15                      | 0                        | -             | -                       | -                        |
| Cowpea                                       | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Tomatoes                                     | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Hot pepper                                   | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Others                                       | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| (2) Undeveloped Area (Rainfed)               | 7.2       |                         |                          | -         |                         |                          | 91.3      |                         |                          | -         |                         |                          | 39.5      |                         |                          | 62.6          |                         |                          |
| Cassava                                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | 18.3      | 447                     | 8                        | 8.3           | 431                     | 4                        |
| Yam  | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | 7.1           | 1,499                   | 11                       |
| Sweet Potatoes                               | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Maize  | 7.2       | 55                      | 0                        | -         | -                       | -                        | 58.6      | 261                     | 15                       | -         | -                       | -                        | 21.2      | 15                      | 0                        | 47.2          | 257                     | 12                       |
| Groundnuts                                   | -         | -                       | -                        | -         | -                       | -                        | 15.1      | 443                     | 7                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Tomatoes                                     | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Hot pepper                                   | -         | -                       | -                        | -         | -                       | -                        | 17.6      | 1,126                   | 20                       | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Sugarcane                                    | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| <b>3. Benefit With Project</b>               | 87        | 150                     |                          | 440       | 1,451                   |                          | 408       | 1,424                   |                          | 1,070     | 1,793                   |                          | 302       | 426                     |                          | 712           | 2,432                   |                          |
| Paddy  | 13        | 1,068                   | 14                       | 44        | 1,208                   | 53                       | -         | -                       | -                        | 942       | 1,164                   | 1,096                    | 150       | 1,151                   | 173                      | -             | -                       | -                        |
| Okra   | 44        | 2,825                   | 124                      | 44        | 1,814                   | 80                       | 51        | 1,721                   | 88                       | 128       | 5,446                   | 697                      | 18        | 1,675                   | 30                       | 89            | 5,002                   | 445                      |
| Tomatoes                                     | -         | -                       | -                        | 44        | 2,524                   | 111                      | 51        | 4,585                   | 234                      | -         | -                       | -                        | 20        | 6,142                   | 123                      | 89            | 6,165                   | 549                      |
| Egg Plant                                    | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Onion  | -         | -                       | -                        | -         | -                       | -                        | 102       | 10,218                  | 1,042                    | -         | -                       | -                        | 38        | 2,023                   | 77                       | 178           | 7,442                   | 1,325                    |
| Water melon                                  | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Hot Pepper                                   | -         | -                       | -                        | 44        | 4,088                   | 180                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Tinda  | -         | -                       | -                        | 44        | 7,861                   | 346                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Cluster bean                                 | -         | -                       | -                        | 44        | 1,986                   | 87                       | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Sweet Potatoes                               | -         | -                       | -                        | 44        | 1,949                   | 86                       | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| L.Marrow                                     | -         | -                       | -                        | 44        | 5,518                   | 243                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| R.Marrow                                     | -         | -                       | -                        | 44        | 5,518                   | 243                      | -         | -                       | -                        | -         | -                       | -                        | -         | -                       | -                        | -             | -                       | -                        |
| Maize  | 15        | 531                     | 8                        | 44        | 508                     | 22                       | 102       | 384                     | 39                       | -         | -                       | -                        | 38        | 398                     | 15                       | 178           | 409                     | 73                       |
| Cowpea                                       | 15        | 285                     | 4                        | -         | -                       | -                        | 102       | 205                     | 21                       | -         | -                       | -                        | 38        | 222                     | 8                        | 178           | 226                     | 40                       |
| (3) Cropping Intensity                       | 200%      |                         |                          | 200%      |                         |                          | 200%      |                         |                          | 200%      |                         |                          | 200%      |                         |                          | 200%          |                         |                          |
| <b>4. Incremental Benefit (Cedi Million)</b> |           |                         | 96                       |           | 754                     |                          |           | 1,161                   |                          |           | 1,041                   |                          |           | 412                     |                          |               | 2,354                   |                          |
| <b>(US\$/ha)</b>                             |           |                         | 1,558                    |           | 2,448                   |                          |           | 4,085                   |                          |           | 1,390                   |                          |           | 1,962                   |                          |               | 4,723                   |                          |

**Table A-49 Economic Benefits (2/2)**

| Projects                          | Mankessim   |                               |                          | Akumadan    |                               |                          | Tanoso      |                               |                          | Bontanga     |                               |                          | Subinja     |                               |                          | Okyereko    |                               |                          |
|-----------------------------------|-------------|-------------------------------|--------------------------|-------------|-------------------------------|--------------------------|-------------|-------------------------------|--------------------------|--------------|-------------------------------|--------------------------|-------------|-------------------------------|--------------------------|-------------|-------------------------------|--------------------------|
|                                   | Area (ha)   | N.R. Value (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha)   | N.R. Value (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha)   | N.R. Value (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha)    | N.R. Value (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha)   | N.R. Value (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) | Area (ha)   | N.R. Value (10 <sup>3</sup> ) | Value (10 <sup>6</sup> ) |
| <b>1. Land Use</b>                |             |                               |                          |             |                               |                          |             |                               |                          |              |                               |                          |             |                               |                          |             |                               |                          |
| (1) Present                       | 256         |                               |                          | 65          |                               |                          | 115         |                               |                          | 450          |                               |                          | 121         |                               |                          | 111         |                               |                          |
| Developed                         | 17          |                               |                          | 65          |                               |                          | 64          |                               |                          | 450          |                               |                          | 60          |                               |                          | 40          |                               |                          |
| Undeveloped                       | 239         |                               |                          | -           |                               |                          | 51          |                               |                          | -            |                               |                          | 61          |                               |                          | 71          |                               |                          |
| (2) Without Project               | 256         |                               |                          | 65          |                               |                          | 115         |                               |                          | 450          |                               |                          | 121         |                               |                          | 121         |                               |                          |
| Developed                         | 17          |                               |                          | 65          |                               |                          | 64          |                               |                          | 450          |                               |                          | 60          |                               |                          | 60          |                               |                          |
| Undeveloped                       | 239         |                               |                          | -           |                               |                          | 51          |                               |                          | -            |                               |                          | 61          |                               |                          | 61          |                               |                          |
| (3) With Project                  | 256         |                               |                          | 65          |                               |                          | 115         |                               |                          | 450          |                               |                          | 121         |                               |                          | 111         |                               |                          |
| Irrigated                         | 176         |                               |                          | 31          |                               |                          | 30          |                               |                          | 450          |                               |                          | 70          |                               |                          | 111         |                               |                          |
| Undeveloped                       | 80          |                               |                          | 34          |                               |                          | 85          |                               |                          | -            |                               |                          | 51          |                               |                          | -           |                               |                          |
| <b>2. Benefit Without Project</b> | <b>58.8</b> | <b>80</b>                     |                          | <b>55.4</b> | <b>51</b>                     |                          | <b>36.3</b> | <b>64</b>                     |                          | <b>461.1</b> | <b>645</b>                    |                          | <b>53.5</b> | <b>33</b>                     |                          | <b>88.3</b> | <b>38</b>                     |                          |
| (1) Developed Area                | 31.6        |                               |                          | 55.4        |                               |                          | 36.3        |                               |                          | 461.1        |                               |                          | 52.5        |                               |                          | 21.6        |                               |                          |
| Irrigated                         | 26.4        |                               |                          | 23.9        |                               |                          | 22.0        |                               |                          | 461.1        |                               |                          | 12.6        |                               |                          | 21.6        |                               |                          |
| Okra                              | 3.5         | 907                           | 3                        | -           |                               |                          | -           |                               |                          | 99.6         | 1,004                         | 100                      | *           |                               | -                        | -           |                               |                          |
| Tomatoes                          | -           | -                             | -                        | 23.9        | 1,416                         | 34                       | 21.8        | 2,696                         | 59                       | 55.4         | 1,689                         | 94                       | *           |                               | -                        | -           |                               |                          |
| Egg Plant                         | 10.8        | 2,593                         | 28                       | -           |                               |                          | *           |                               |                          | 13.7         | 2,894                         | 40                       | 5.3         | 1,680                         | 9                        | -           |                               |                          |
| Onion                             | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | 16.6         | 1,948                         | 32                       | -           |                               | -                        | -           |                               |                          |
| Water melon                       | 12.1        | 1,581                         | 19                       | -           |                               |                          | *           |                               |                          | -            | -                             | -                        | -           |                               | -                        | -           |                               |                          |
| Hot Pepper                        | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | 8.9          | 674                           | 6                        | 5.3         | 416                           | 2                        | -           |                               |                          |
| Tinda                             | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            | -                             | -                        | -           |                               | -                        | -           |                               |                          |
| Cluster bean                      | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            | -                             | -                        | -           |                               | -                        | -           |                               |                          |
| Paddy                             | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | 255.9        | 1,451                         | 371                      | -           |                               | 21.6                     | 889         | 19                            |                          |
| Maize                             | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | 11.0         | 211                           | 2                        | -           |                               | -                        | -           |                               |                          |
| Sweet potatoes                    | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            | -                             | -                        | -           |                               | -                        | -           |                               |                          |
| Others                            | -           | -                             | -                        | -           |                               |                          | 0.2         | 1,680                         | 0                        | -            | -                             | -                        | 2.0         | 1,680                         | 3                        | -           |                               |                          |
| Rainfed                           | 5.2         |                               |                          | 31.5        |                               |                          | 14.3        |                               |                          | -            |                               |                          | 39.9        |                               |                          | -           |                               |                          |
| Cassava                           | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Yam                               | -           | -                             | -                        | 2.9         | 2,658                         | 8                        | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Sweet Potatoes                    | 5.2         | 1,812                         | 9                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Maize                             | -           | -                             | -                        | 19.1        | 271                           | 5                        | 9.0         | 278                           | 3                        | -            |                               |                          | 26.3        | 282                           | 7                        | -           |                               |                          |
| Cowpea                            | -           | -                             | -                        | 4.9         | 154                           | 1                        | 0.8         | 154                           | 0                        | -            |                               |                          | 13.5        | 154                           | 2                        | -           |                               |                          |
| Tomatoes                          | -           | -                             | -                        | 0.4         | 1,416                         | 1                        | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Hot pepper                        | -           | -                             | -                        | 1.9         | 416                           | 1                        | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Others                            | -           | -                             | -                        | 2.3         | 358                           | 1                        | 4.5         | 358                           | 2                        | -            |                               |                          | 0.1         | 154                           | 0                        | -           |                               |                          |
| (2) Undeveloped Area (Rainfed)    | 21.2        |                               |                          | -           |                               |                          | 0.0         |                               |                          | -            |                               |                          | 1.0         |                               | 5                        | 66.7        |                               |                          |
| Cassava                           | 1.8         | 1,509                         | 3                        | -           |                               |                          | 0.0         | 885                           | 0                        | -            |                               |                          | 1.0         | 4,887                         | 5                        | 8.2         | 260                           | 2                        |
| Yam                               | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Sweet Potatoes                    | 4.7         | 1,812                         | 9                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Maize                             | 12.4        | 307                           | 4                        | -           |                               |                          | 0.0         | 278                           | 0                        | -            |                               |                          | -           |                               | -                        | 38.1        | 350                           | 13                       |
| Groundnuts                        | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | 15.0        | 70                            | 1                        |
| Tomatoes                          | 3.5         | 80                            | 0                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | 5.4         | 633                           | 3                        |
| Hot pepper                        | 2.4         | 1,577                         | 4                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Sugarcane                         | 2.4         | 515                           | 1                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| <b>3. Benefit With Project</b>    | <b>352</b>  | <b>879</b>                    |                          | <b>63</b>   | <b>134</b>                    |                          | <b>60</b>   | <b>128</b>                    |                          | <b>901</b>   | <b>1,140</b>                  |                          | <b>140</b>  | <b>249</b>                    |                          | <b>223</b>  | <b>383</b>                    |                          |
| Paddy                             | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | 414          | 1,292                         | 535                      | -           |                               | -                        | 111         | 1,112                         | 123                      |
| Okra                              | 44          | 2,823                         | 124                      | 10          | 2,835                         | 28                       | 10          | 2,547                         | 25                       | 81           | 1,304                         | 106                      | 23          | 2,998                         | 69                       | 14          | 2,818                         | 39                       |
| Tomatoes                          | -           | -                             | -                        | 11          | 6,030                         | 66                       | 10          | 6,181                         | 62                       | 45           | 1,305                         | 59                       | -           |                               | -                        | 14          | 2,359                         | 33                       |
| Egg Plant                         | 44          | 2,899                         | 128                      | -           |                               |                          | -           |                               |                          | 23           | 1,065                         | 24                       | 12          | 2,680                         | 32                       | -           |                               |                          |
| Onion                             | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | 135          | 2,509                         | 339                      | -           |                               | -                        | 28          | 6,172                         | 173                      |
| Water melon                       | 88          | 3,110                         | 274                      | 10          | 3,072                         | 31                       | 10          | 3,115                         | 31                       | -            |                               |                          | 23          | 3,160                         | 73                       | -           |                               |                          |
| Hot Pepper                        | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | 12          | 4,119                         | 49                       | -           |                               |                          |
| Tinda                             | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Cluster bean                      | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Sweet Potatoes                    | 88          | 3,710                         | 326                      | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| L.Marrow                          | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| R.Marrow                          | -           | -                             | -                        | -           |                               |                          | -           |                               |                          | -            |                               |                          | -           |                               | -                        | -           |                               |                          |
| Maize                             | 44          | 369                           | 16                       | 16          | 390                           | 6                        | 15          | 394                           | 6                        | 104          | 482                           | 50                       | 35          | 457                           | 16                       | 28          | 320                           | 9                        |
| Cowpea                            | 44          | 254                           | 11                       | 16          | 214                           | 3                        | 15          | 237                           | 4                        | 99           | 271                           | 27                       | 35          | 276                           | 10                       | 28          | 216                           | 6                        |
| (3) Cropping Intensity            | 200%        |                               |                          | 200%        |                               |                          | 200%        |                               |                          | 200%         |                               |                          | 200%        |                               |                          | 200%        |                               |                          |
| <b>4. Incremental Benefit</b>     |             |                               |                          |             |                               |                          |             |                               |                          |              |                               |                          |             |                               |                          |             |                               |                          |
| (Cedi Million)                    |             | 799                           |                          |             | 83                            |                          |             | 64                            |                          |              | 495                           |                          |             | 216                           |                          |             | 345                           |                          |
| (US\$/ha)                         |             | 3,243                         |                          |             | 1,912                         |                          |             | 1,524                         |                          |              | 786                           |                          |             | 2,204                         |                          |             | 2,220                         |                          |







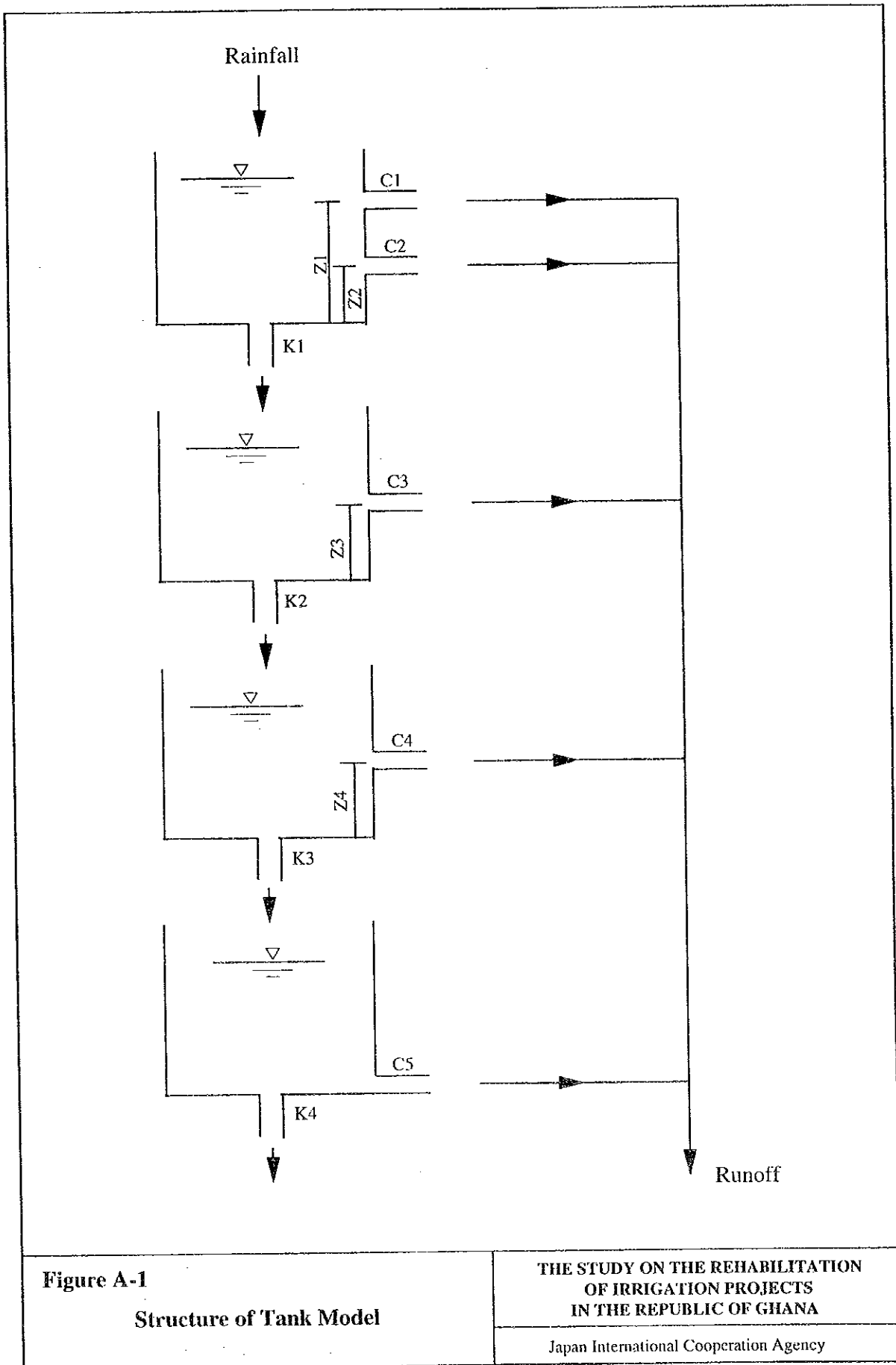
**Table A-51 Preliminary Evaluation of Each Project (Need of Urgent Rehabilitation, Strengthening of Institutional Improvement and Environment Effect)**

| Parameter               | Full Mark | Ashaiman | Weija | Armate | Afife | Aveyime | K.-Torkor | Mankessim | Akumadan | Taroso | Bontanga | Subinja | Okyereko |
|-------------------------|-----------|----------|-------|--------|-------|---------|-----------|-----------|----------|--------|----------|---------|----------|
| 1. Facility             | 5         | 1        | 1     | (1)    | 1     | (1)     | (1)       | 2         | (1)      | (1)    | 2        | (1)     | 3        |
| - Dam & reservoir*1     | 5         | 1        | 4     | 5      | (1)   | 5       | 5         | 5         | 5        | 5      | (1)      | 5       | (1)      |
| - Pump*1                | 5         | 5        | 3     | 5      | 2     | 5       | 5         | 5         | 5        | 5      | 2        | 5       | 5        |
| - Irrigation network    | 5         | 5        | 3     | 1      | 3     | 2       | 1         | 3         | 1        | 1      | 3        | 1       | 3        |
| - Drainage network      | 5         | 4        | 2     | 4      | 3     | 4       | 4         | 4         | 3        | 4      | 3        | 4       | 4        |
| - Road                  | 5         | 3        | 3     | 4      | 2     | 4       | 5         | 4         | 5        | 5      | 2        | 5       | 4        |
| - Buildings             | 30        | 19       | 16    | 20     | 12    | 21      | 21        | 23        | 20       | 21     | 13       | 21      | 20       |
| Sub-Total               | 5         | 5        | 5     | 5      | 5     | 5       | 5         | 5         | 4        | 5      | 5        | 5       | 5        |
| 2. Effect to downstream | 3         | 3        | 2     | 3      | 3     | 3       | 3         | 3         | 3        | 2      | 3        | 2       | 3        |
| 3. Participation        | 5         | 4        | 3     | 5      | 4     | 5       | 5         | 5         | 5        | 3      | 4        | 4       | 5        |
| 4. Activity             | 5         | 1        | 2     | 3      | 4     | 3       | 3         | 3         | 5        | 4      | 4        | 5       | 4        |
| 5. Farmers' economy     | 5         | 4        | 4     | 2      | 4     | 3       | 2         | 3         | 2        | 2      | 4        | 2       | 4        |
| 6. Environment          | 53        | 36       | 32    | 38     | 32    | 40      | 39        | 42        | 39       | 37     | 33       | 39      | 41       |
| Total Point Given       |           |          |       |        |       |         |           |           |          |        |          |         |          |
| Remarks                 |           |          |       |        |       |         |           |           |          |        |          |         |          |

Note : \*1 ( ) means the minimum point which is given to the project, in case of no corresponding facility.

## ***FIGURES***

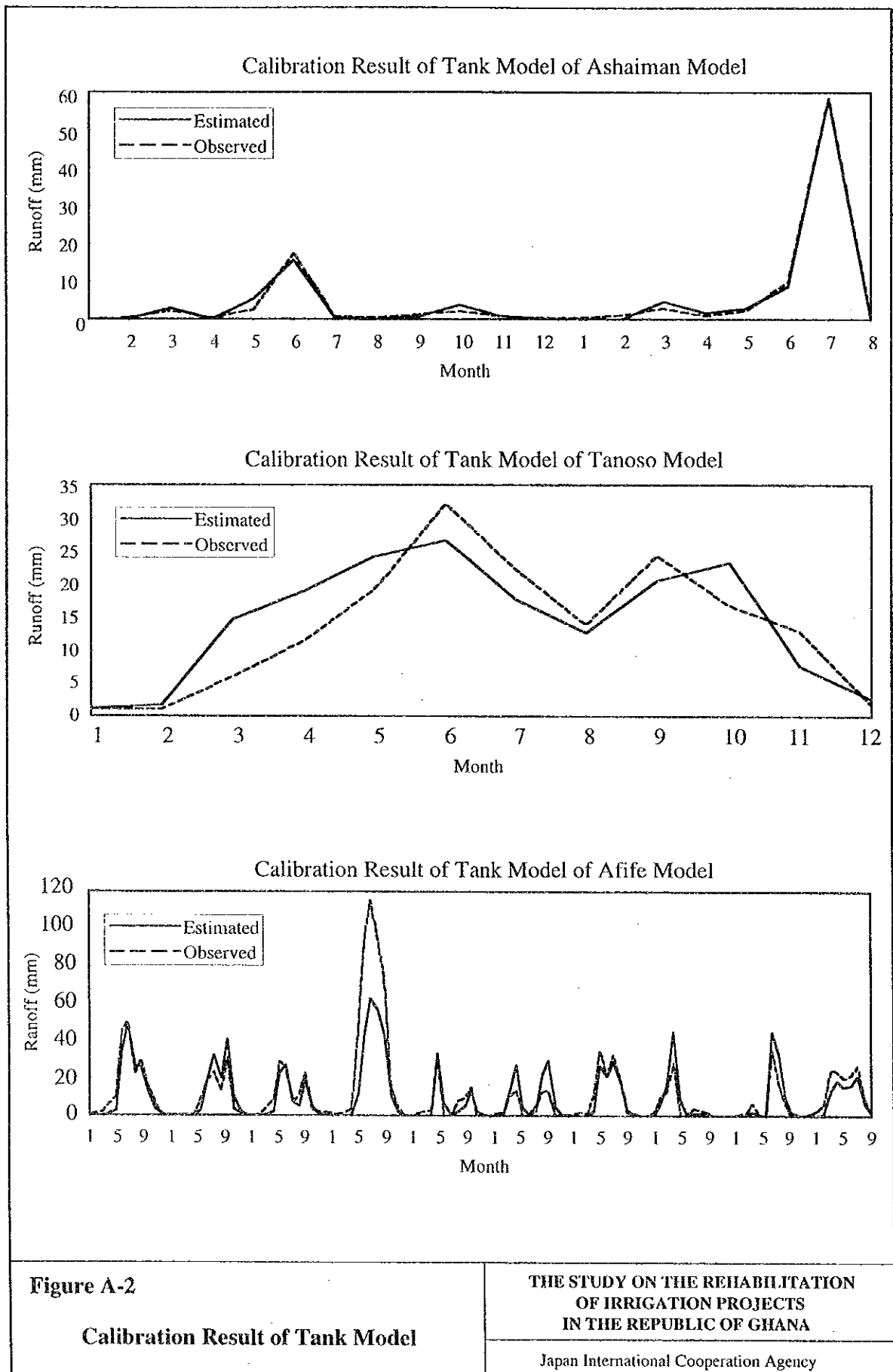




**Figure A-1**  
**Structure of Tank Model**

**THE STUDY ON THE REHABILITATION  
 OF IRRIGATION PROJECTS  
 IN THE REPUBLIC OF GHANA**

Japan International Cooperation Agency



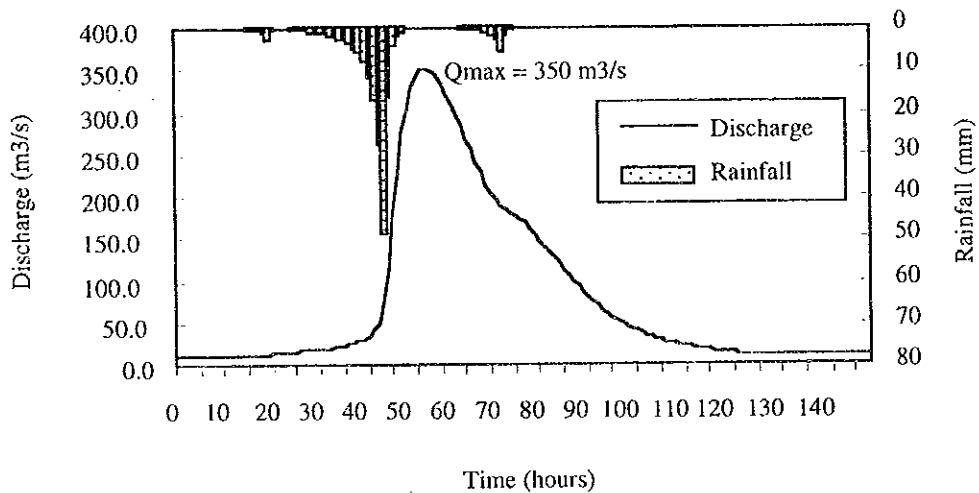
**Figure A-2**

**Calibration Result of Tank Model**

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

Japan International Cooperation Agency

Flood Discharge by Unit Graph Method of Ochi-Amisa River at Mankessim  
(Return Period 25 Years)



Flood Discharge by Unit Graph Method of Gyegyereku River at Weiija  
(Return Period 25 Years)

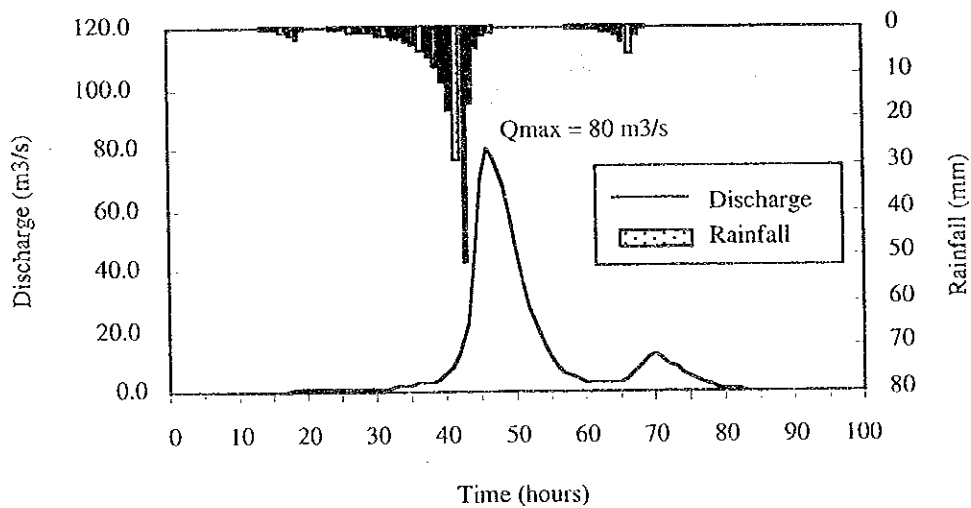


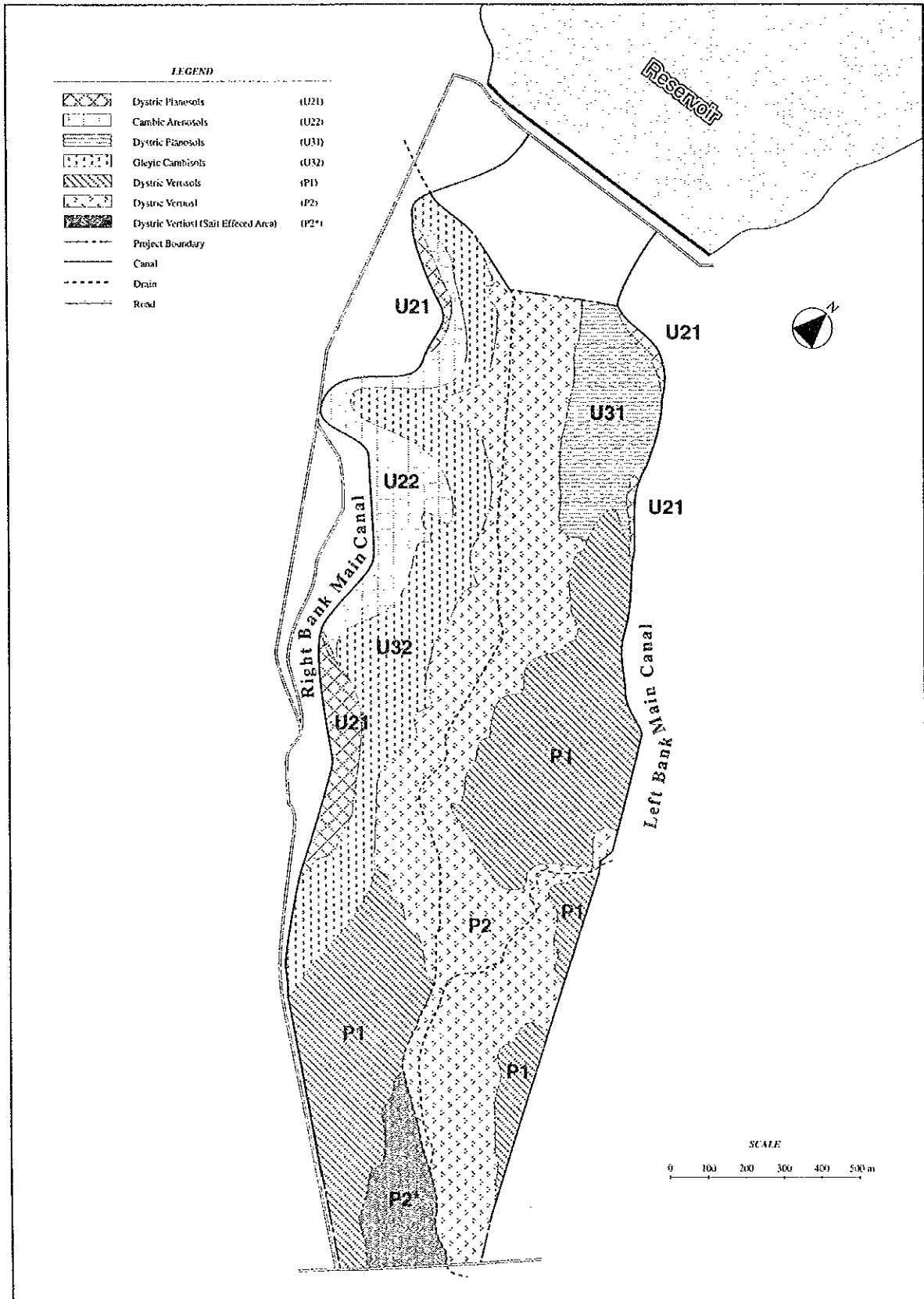
Figure A-3

Flood Discharge by Unit Graph Method

THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA

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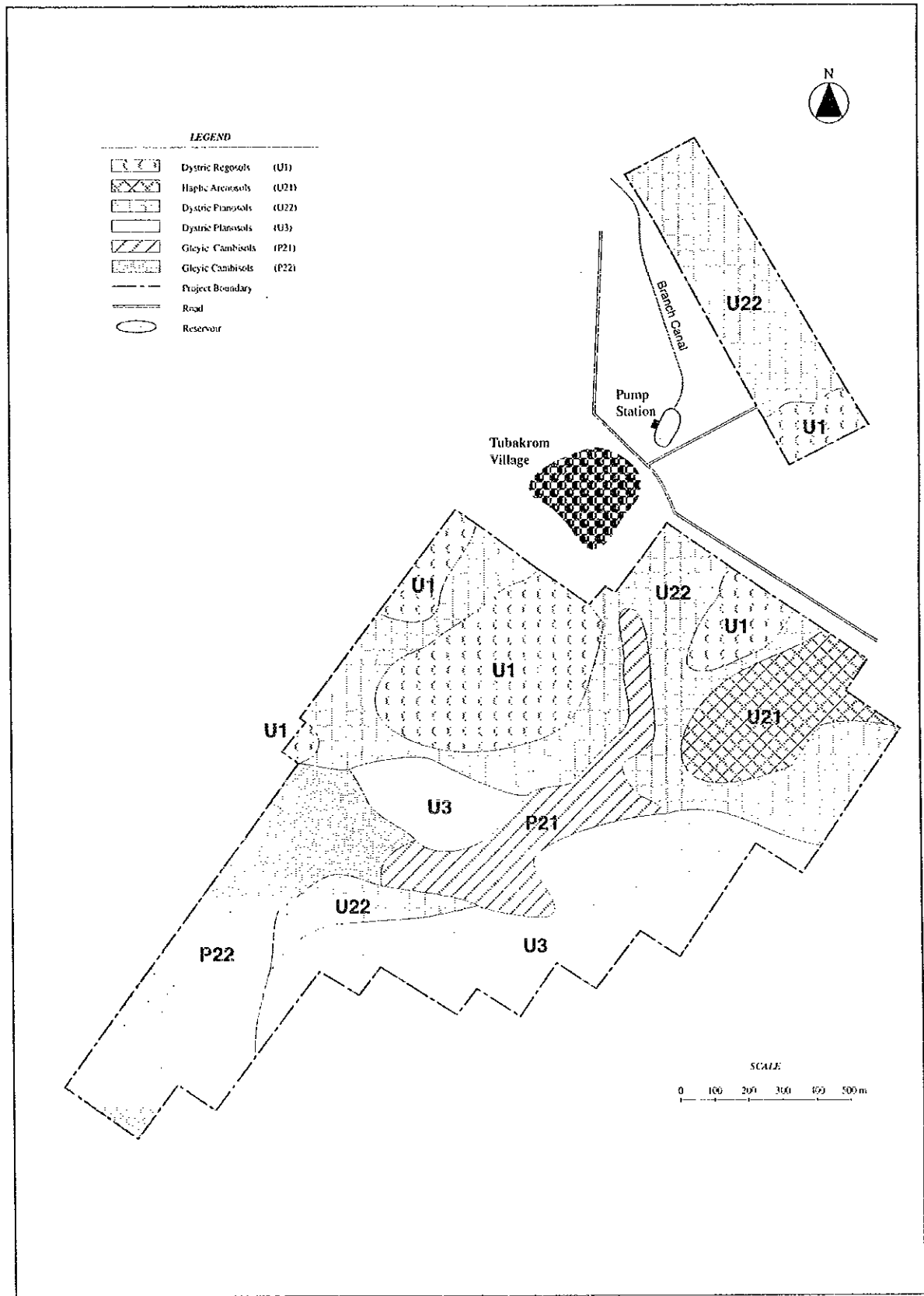




**Figure A-4**  
**Soil Map of Ashaiman**

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

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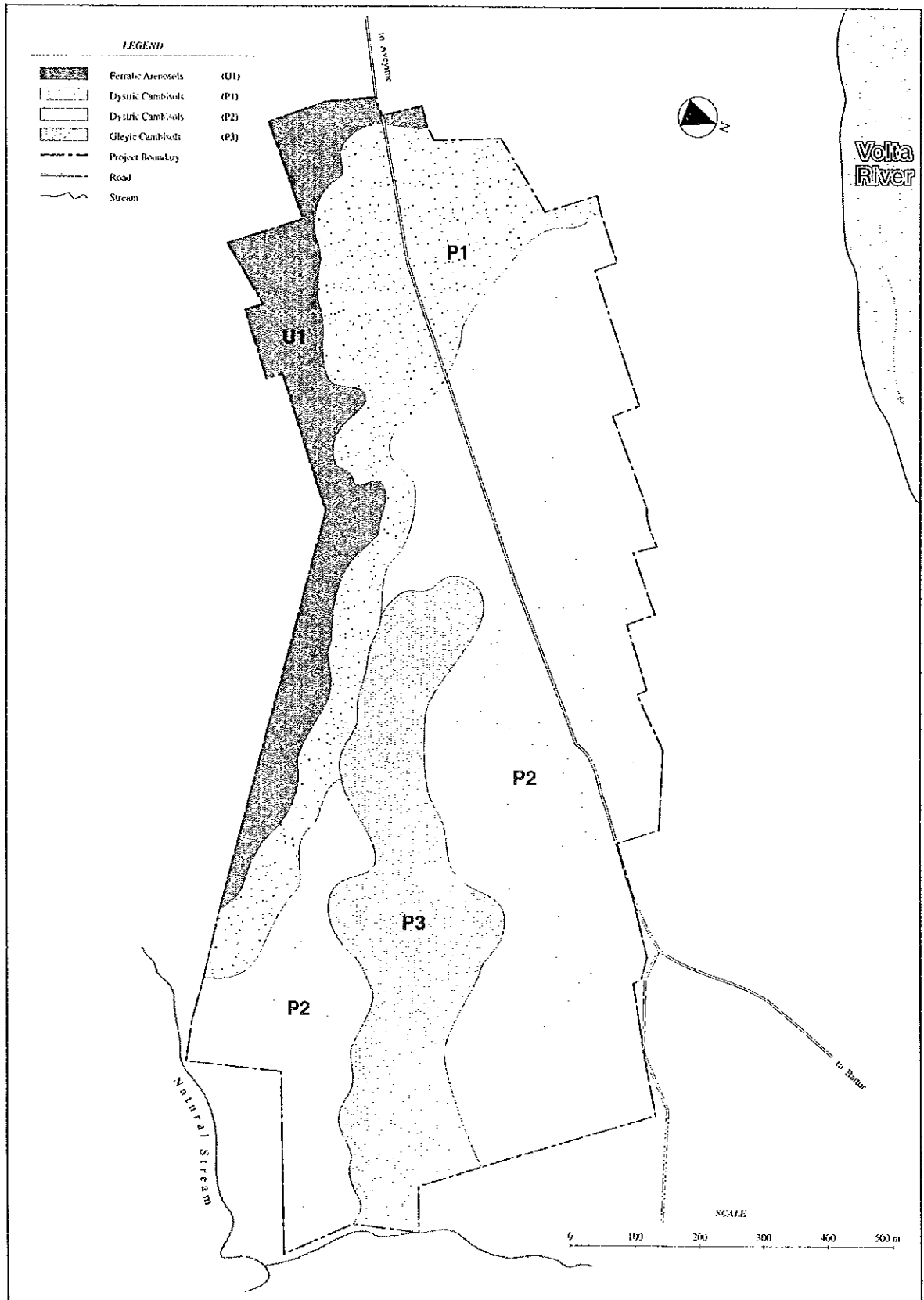


**Figure A-5**

**Soil Map of Weija**

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

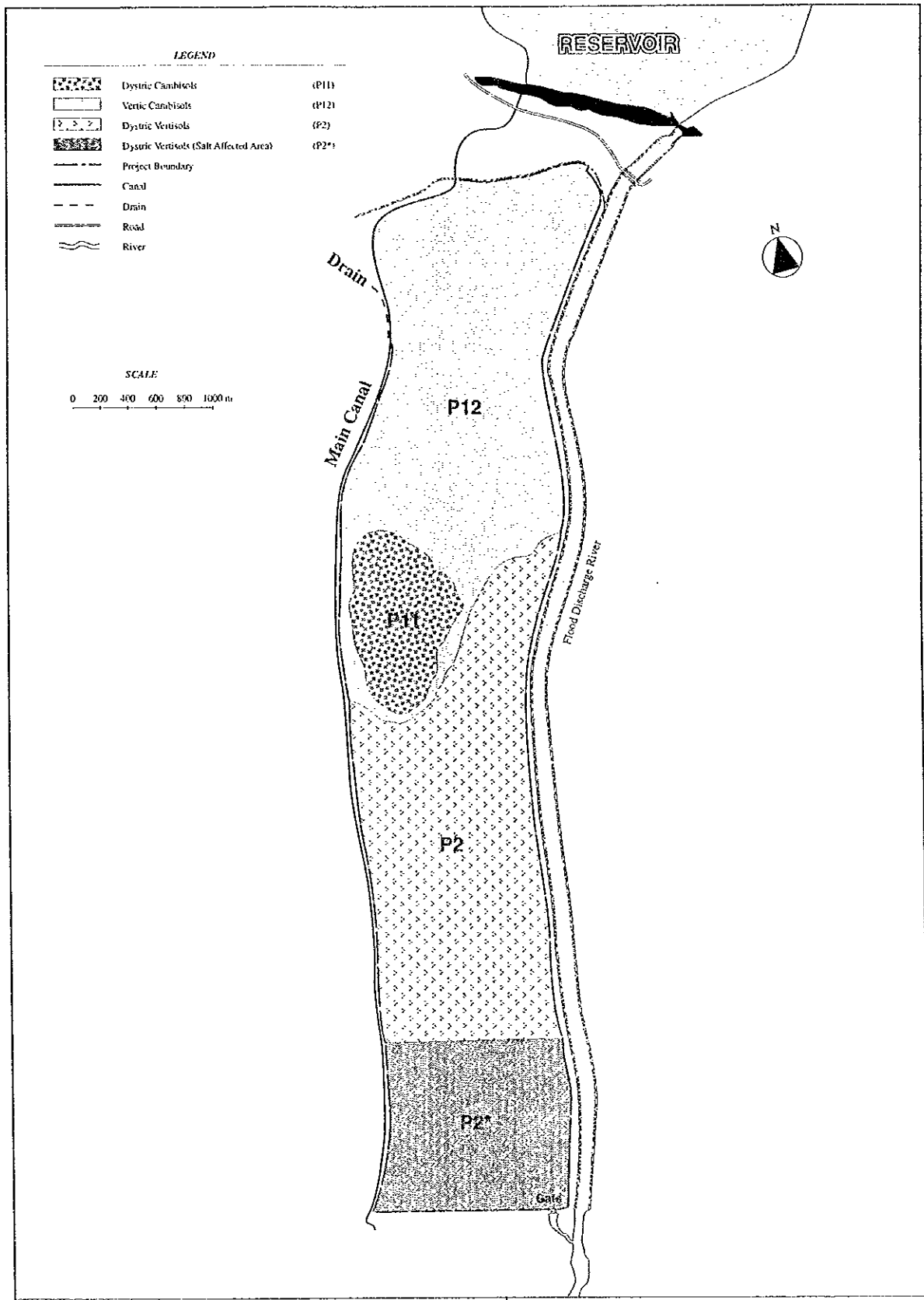
Japan International Cooperation Agency



**Figure A-6**  
Soil Map of Aveyime

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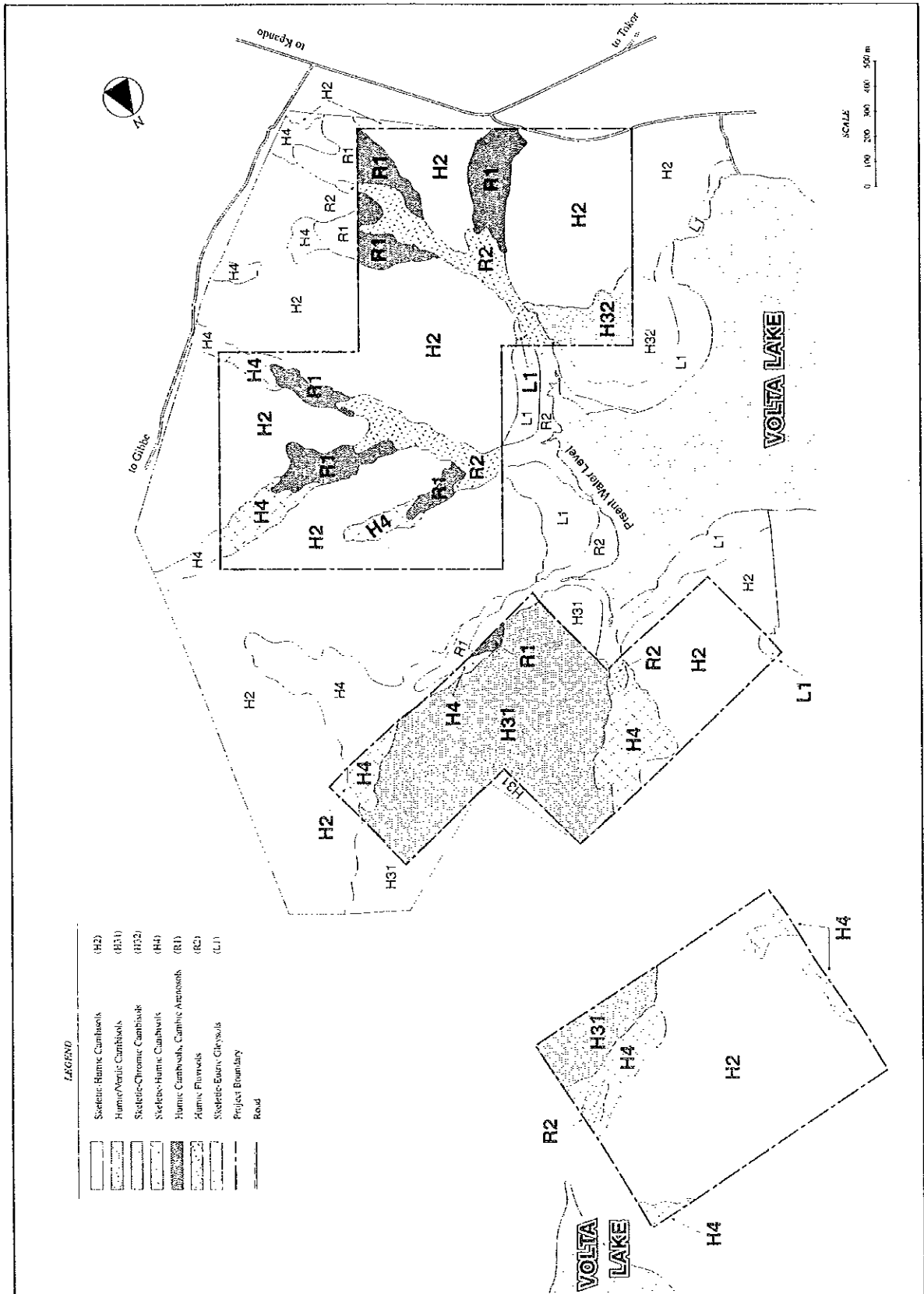


**Figure A-7**

**Soil Map of Afife**

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

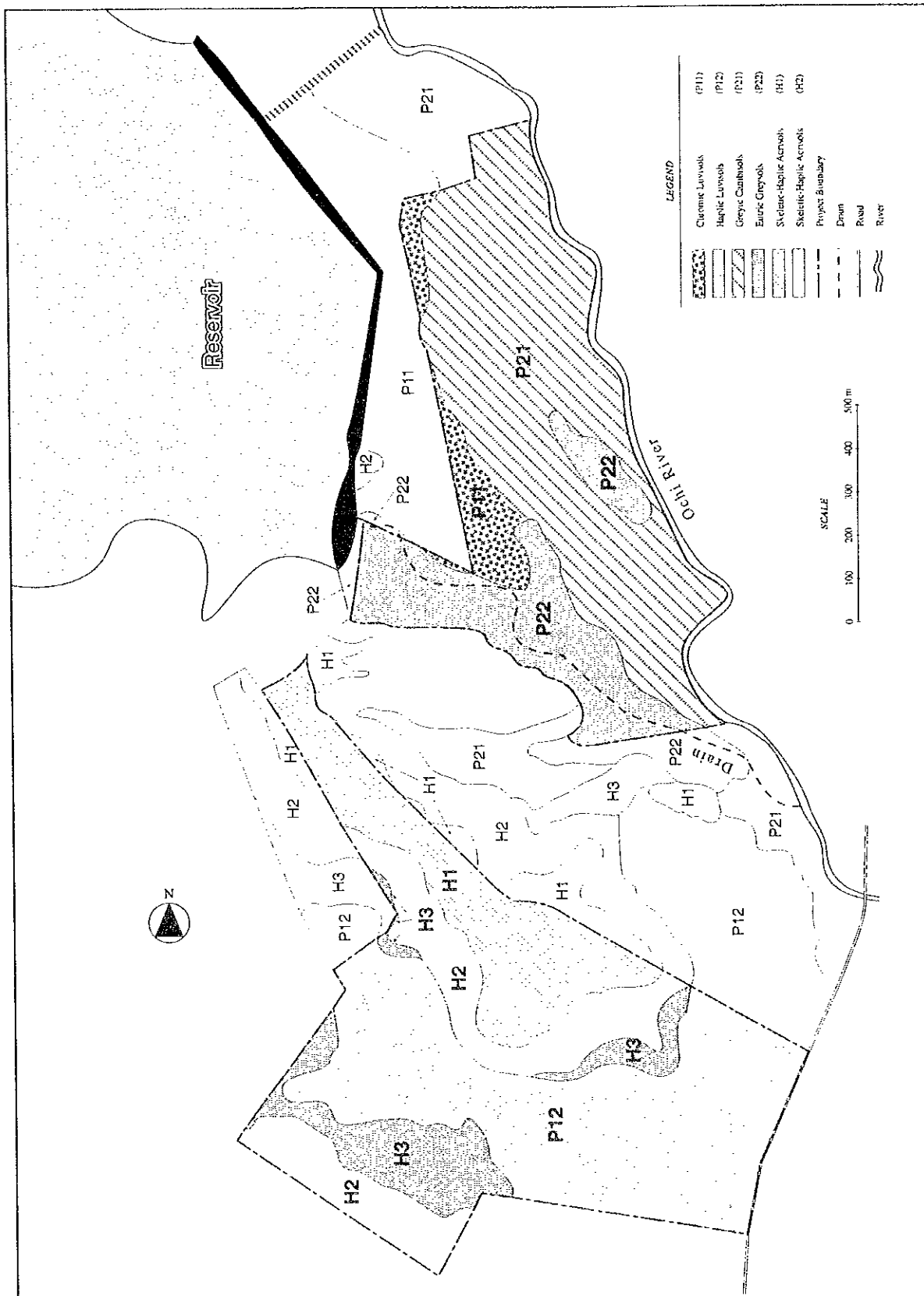
Japan International Cooperation Agency



**Figure A-8**  
Soil Map of Kpando-Torkor

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**Figure A-9**  
Soil Map of Mankessim

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IN THE REPUBLIC OF GHANA**

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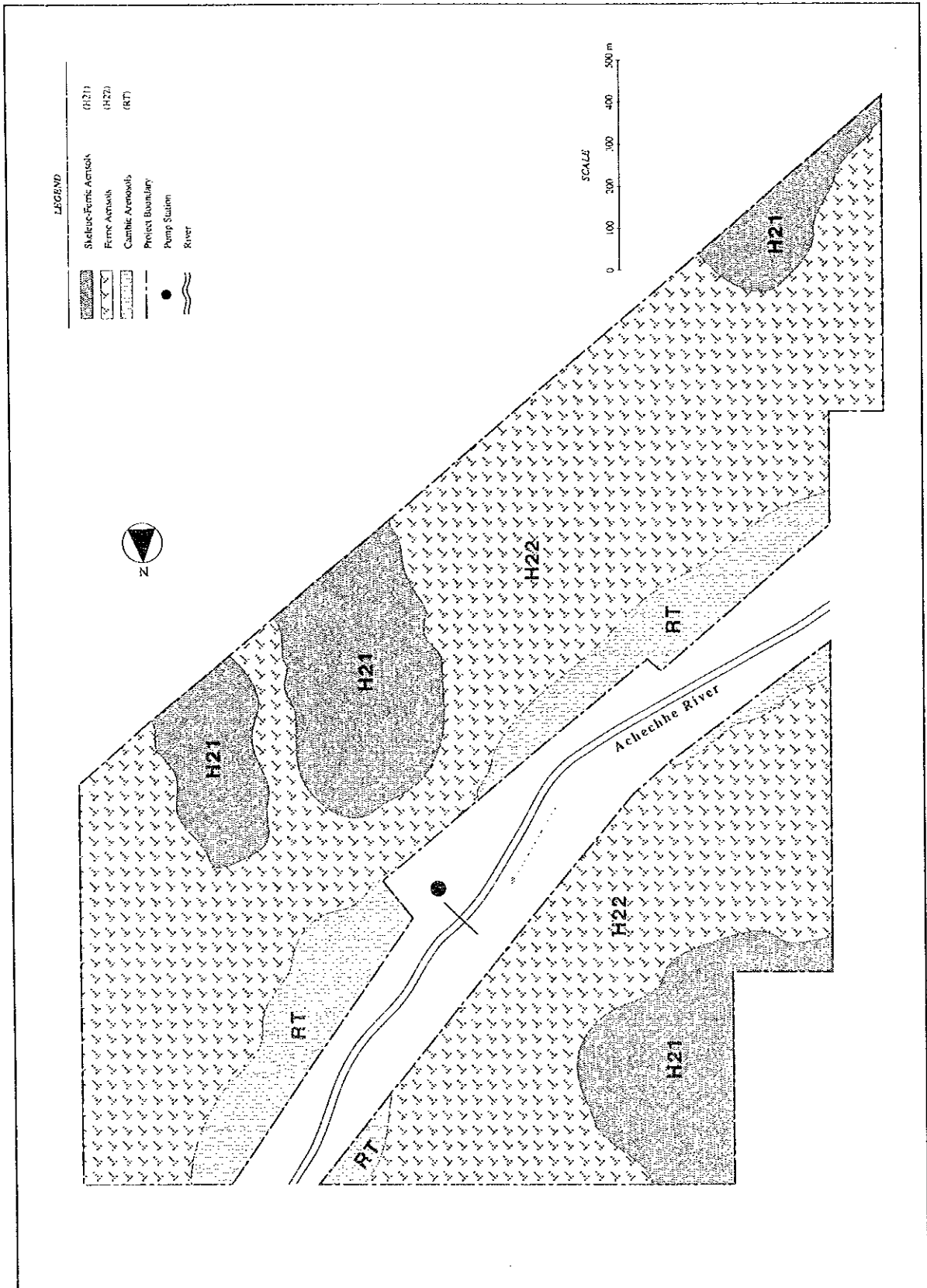
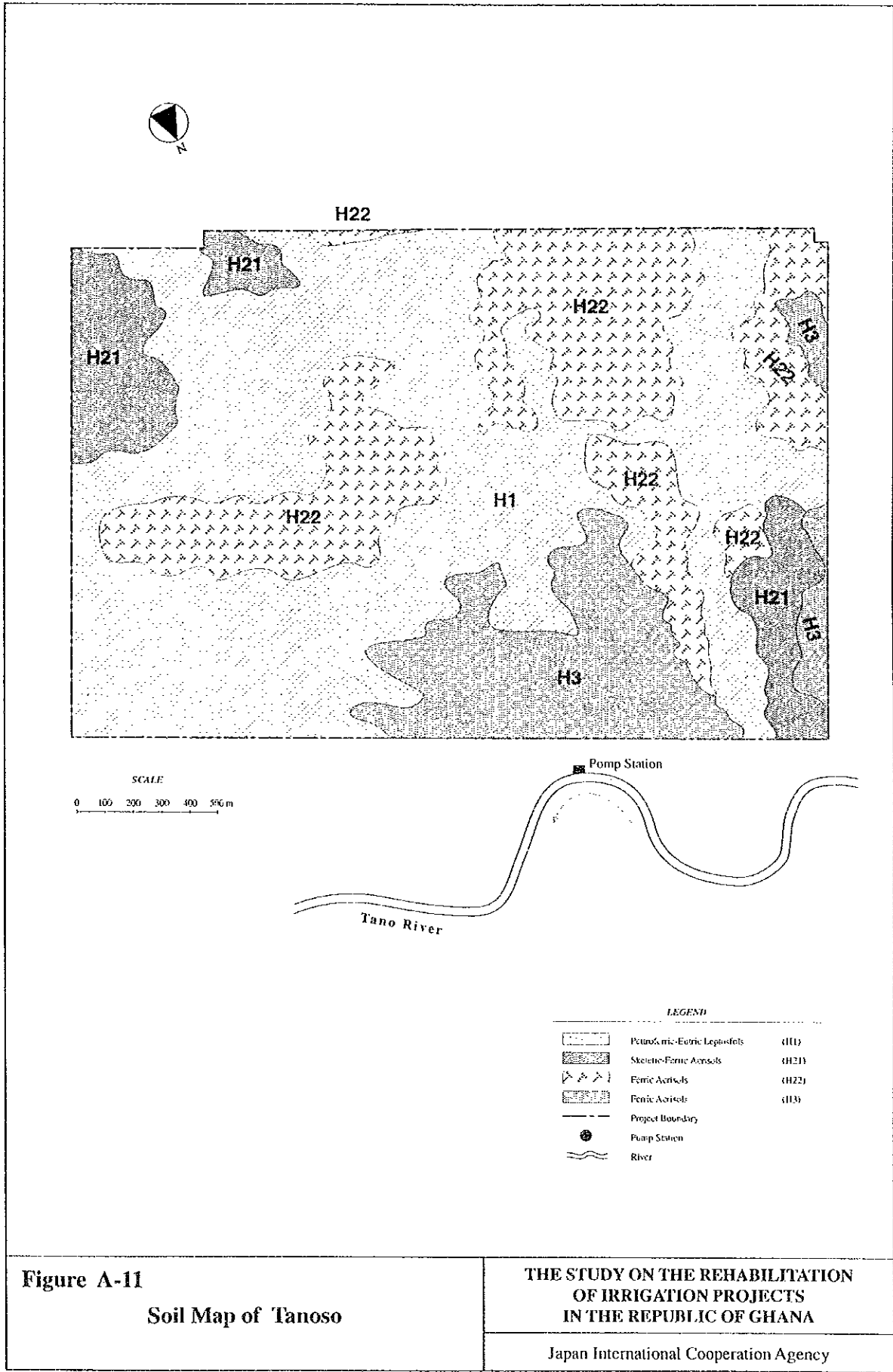


Figure A-10

Soil Map of Akumadan

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IN THE REPUBLIC OF GHANA

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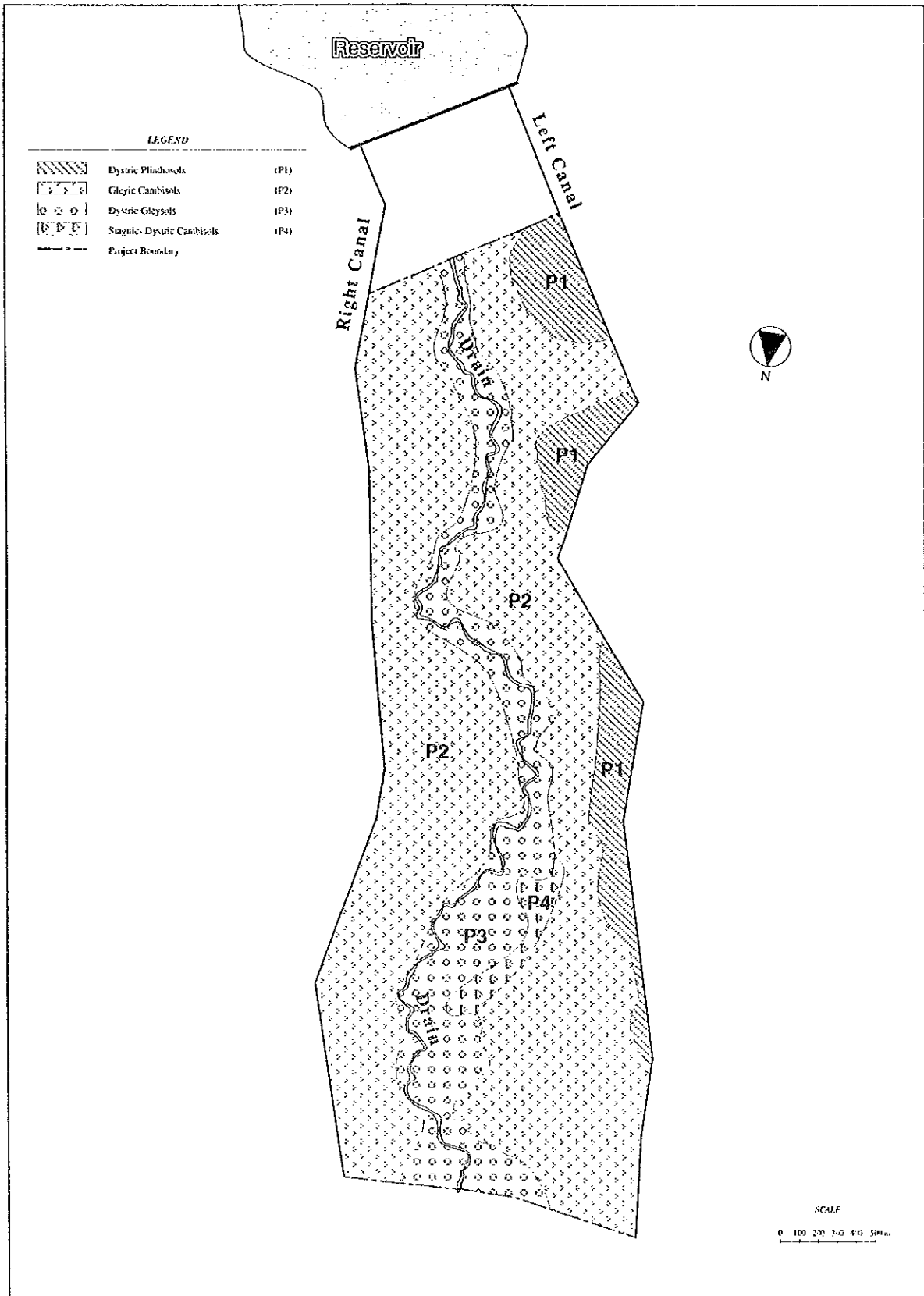


**Figure A-11**  
Soil Map of Tanoso

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

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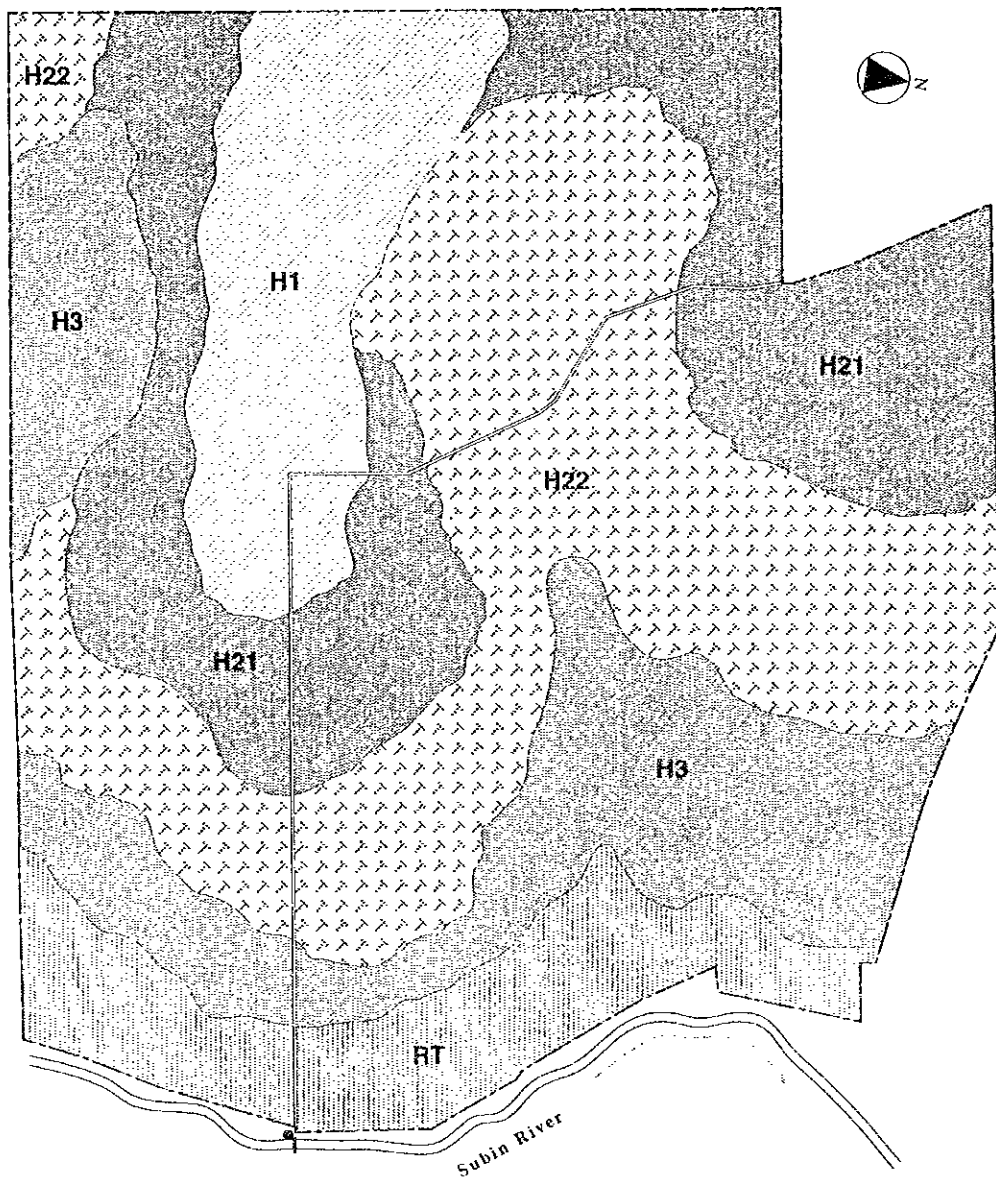




**Figure A-12**  
**Soil Map of Bontanga**

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SCALE  
0 100 200 300 400 500 m

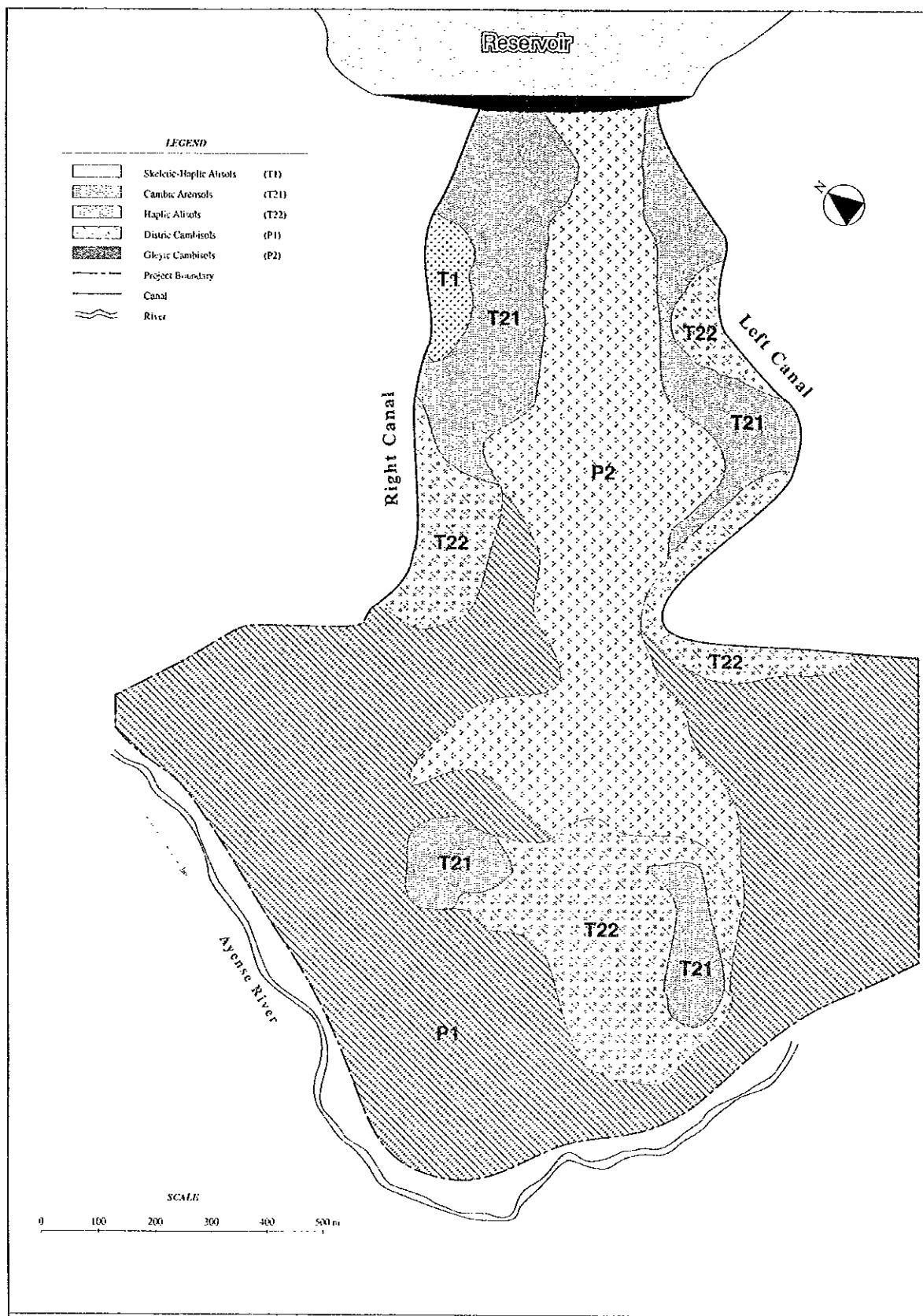
LEGEND

|  |                           |       |
|--|---------------------------|-------|
|  | Petrodimer-Eutric Uxisols | (H1)  |
|  | Skeletic Ferric Acrisols  | (H21) |
|  | Ferric Acrisols           | (H22) |
|  | Ferric Acrisols           | (H3)  |
|  | Cambic Acrisols           | (RT)  |
|  | Project Boundary          |       |
|  | Road                      |       |
|  | River                     |       |

Figure A-13  
Soil Map of Subinja

THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA

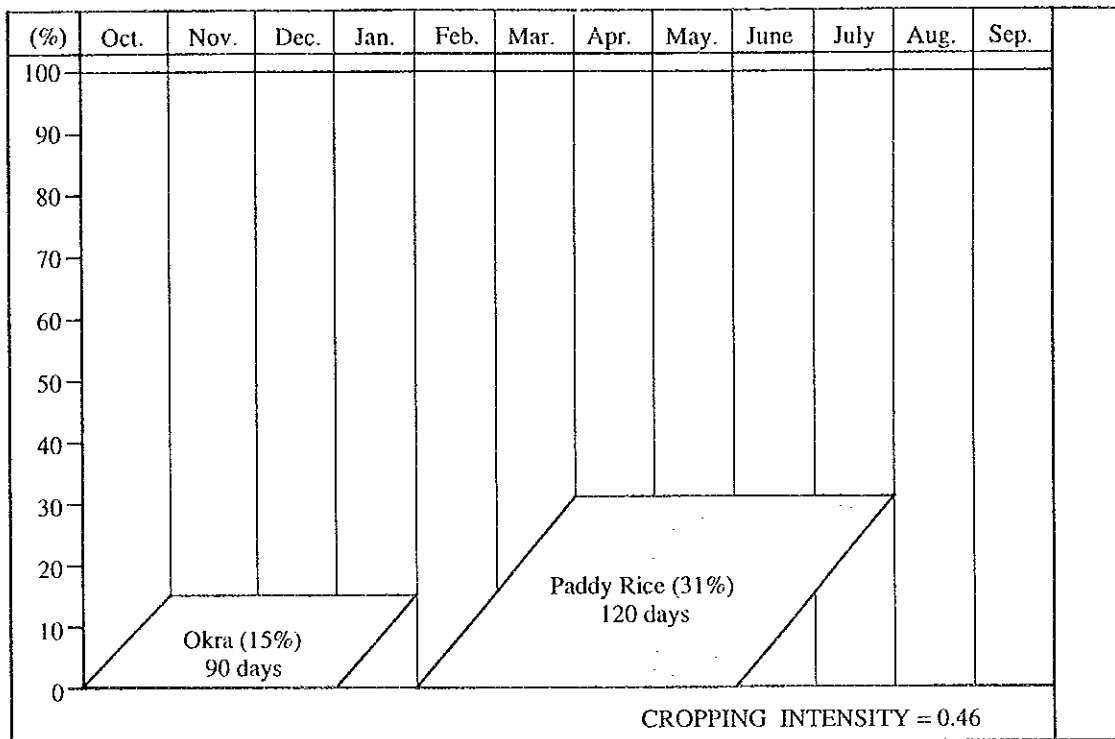
Japan International Cooperation Agency



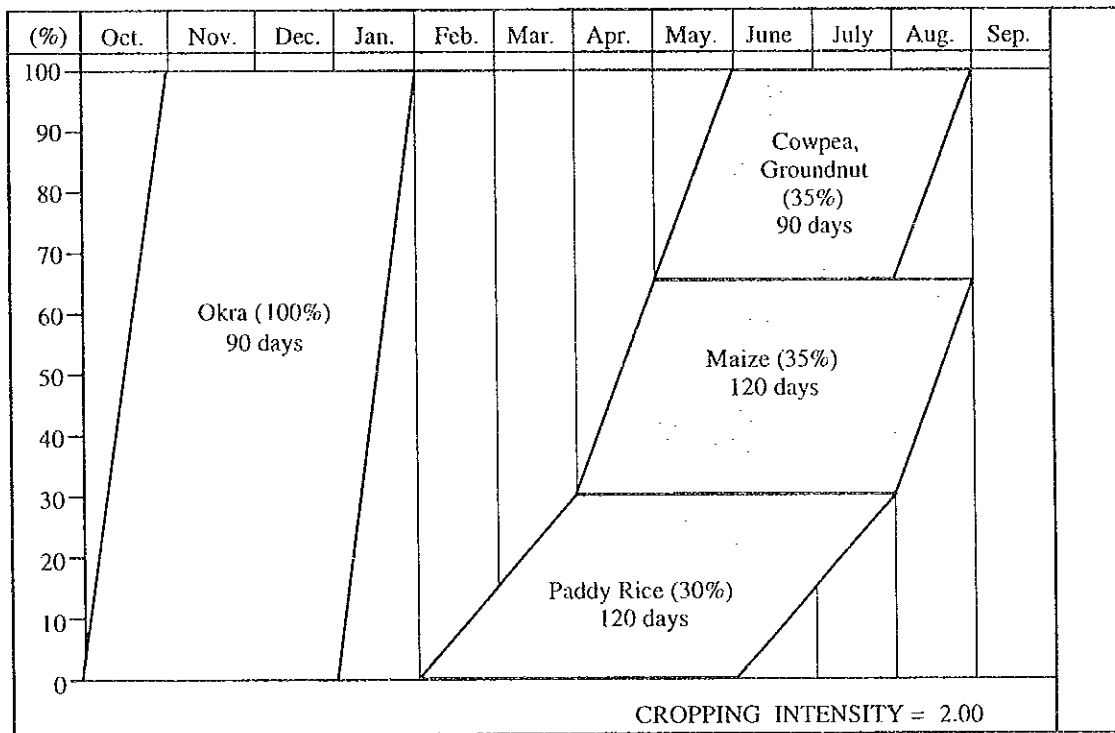
**Figure A-14**  
Soil Map of Okyereko

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OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

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**Present Cropping Pattern**



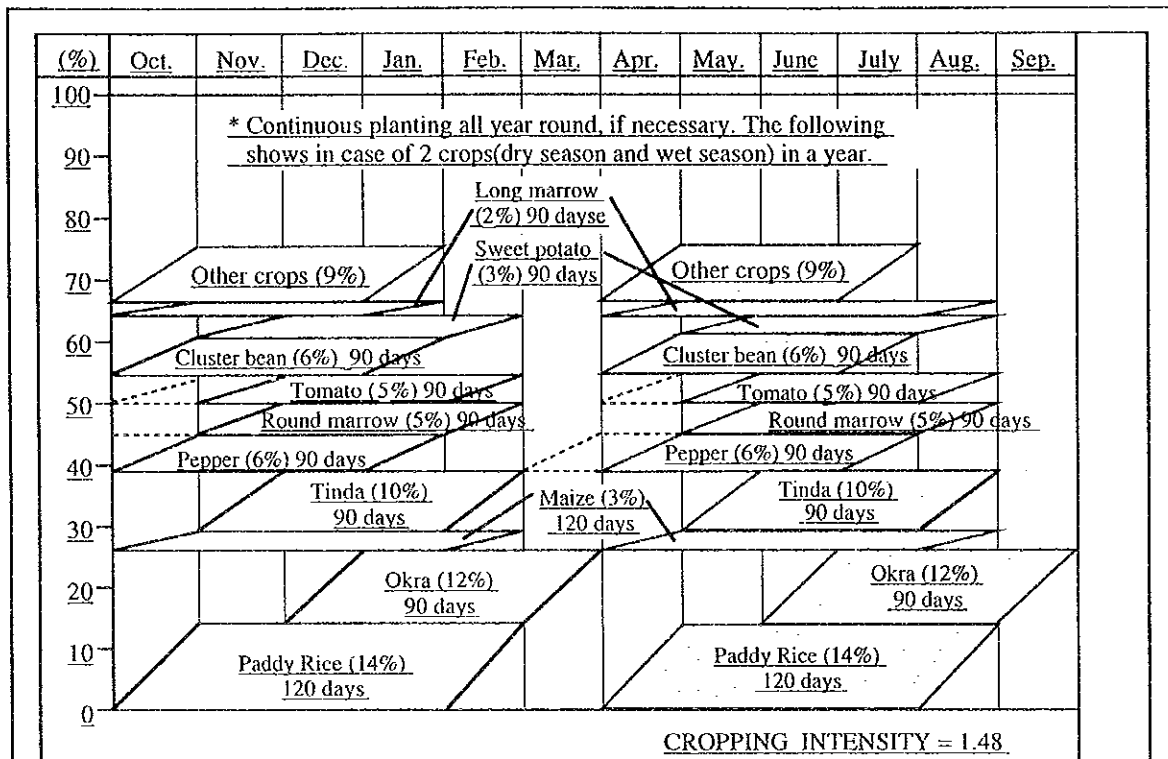
**Proposed Cropping Pattern**

**Figure A-15**

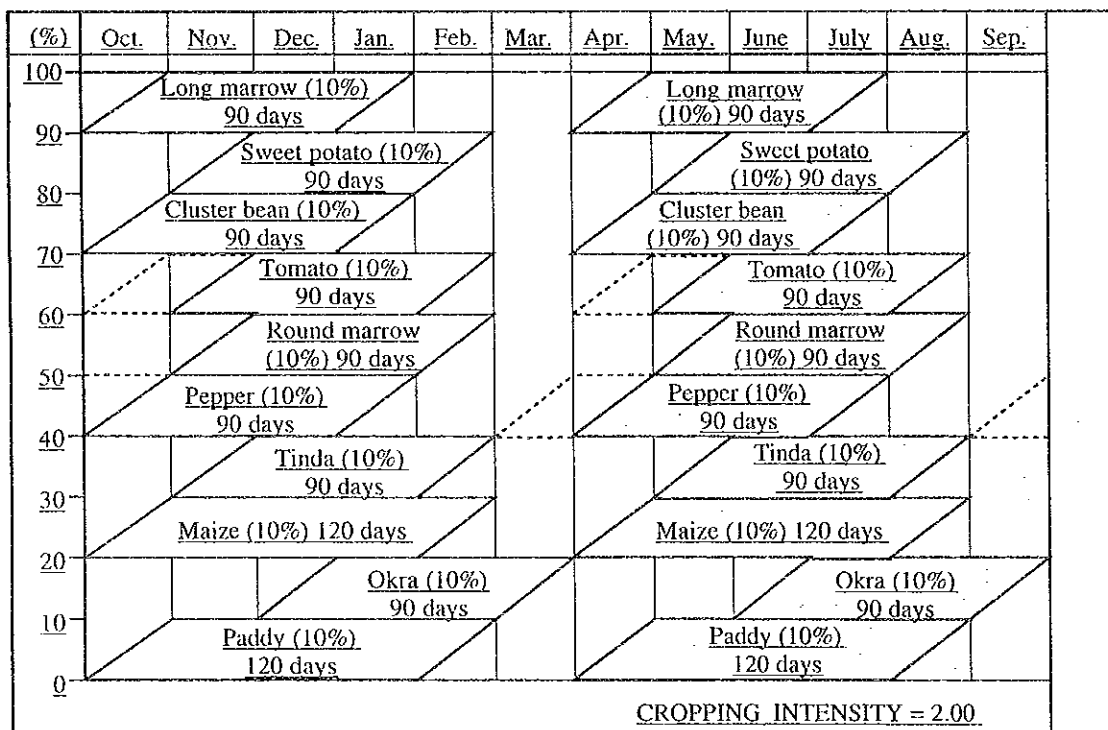
**Present and Proposed Cropping Pattern in Ashiman Project**

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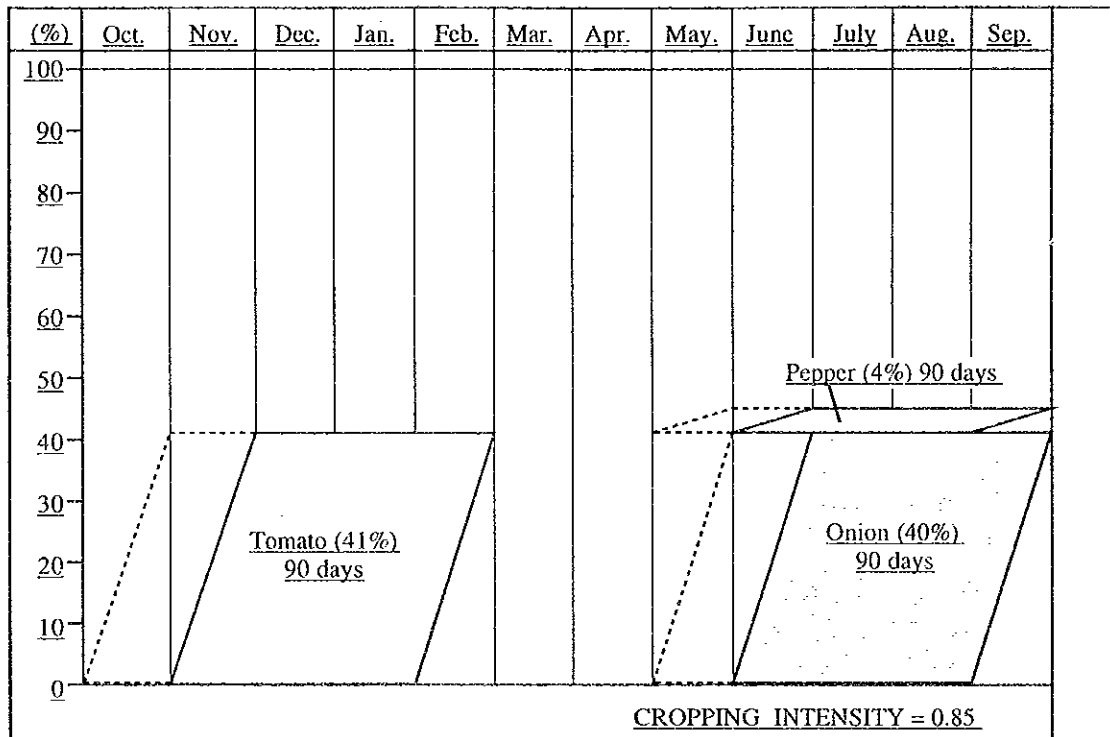


**Present Cropping Pattern**

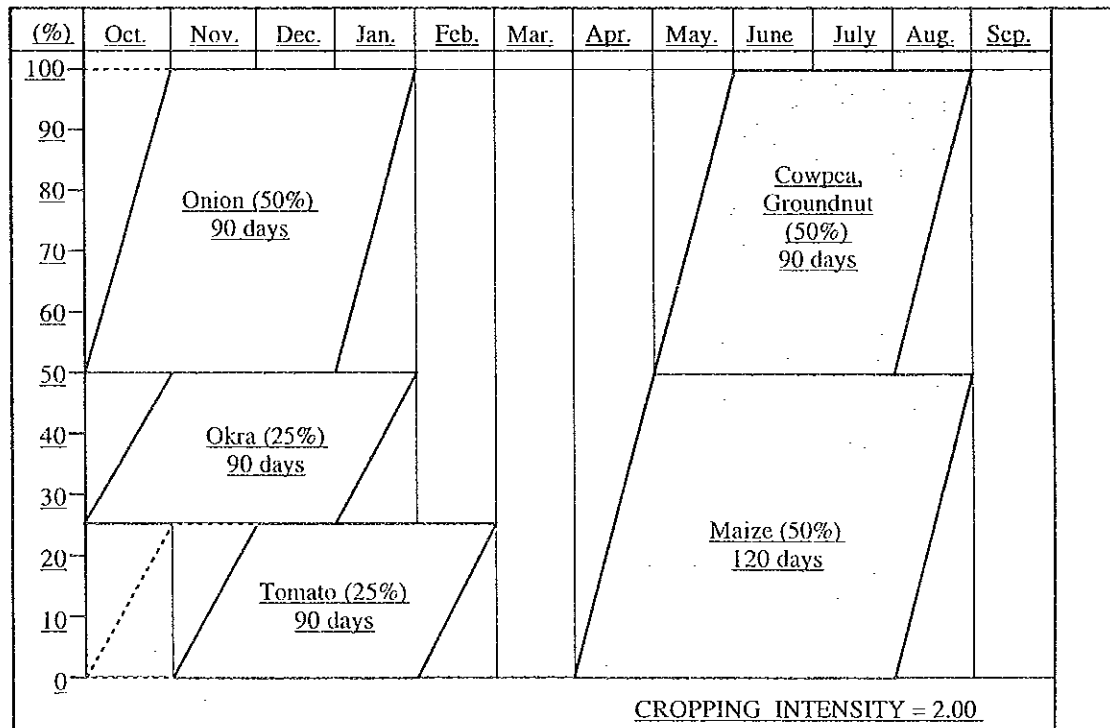


**Proposed Cropping Pattern**

|   |  |
|---|--|
| <b>Figure A-16</b><br><br><b>Present and Proposed Cropping Pattern in Weija Project</b> | <b>THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA</b> |
|   | Japan International Cooperation Agency   |



**Present Cropping Pattern**



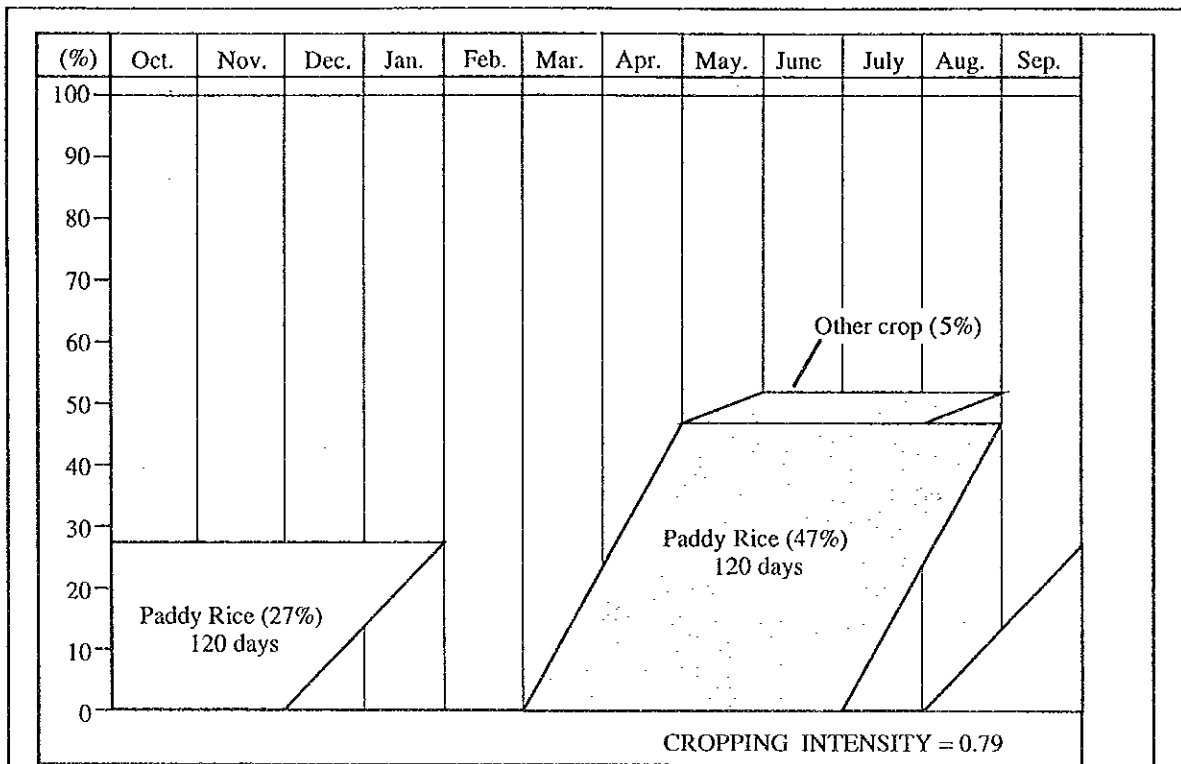
**Proposed Cropping Pattern**

**Figure A-17**

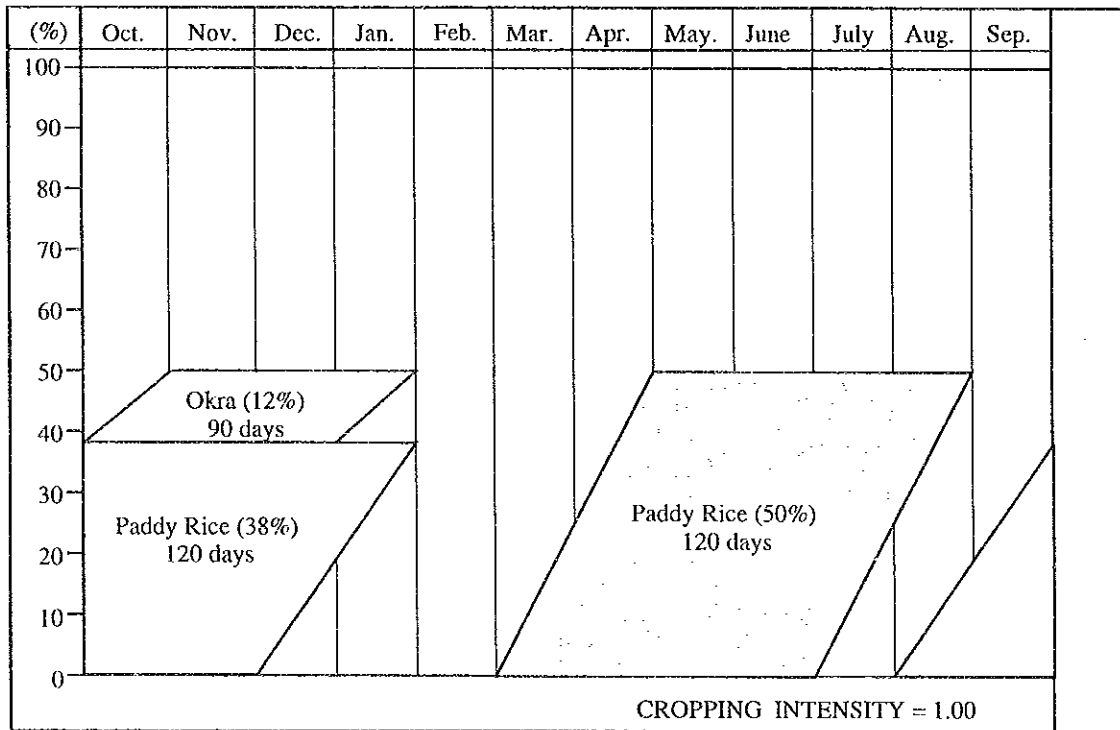
**Present and Proposed Cropping Pattern in Amate Project**

THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA

Japan International Cooperation Agency



**Present Cropping Pattern**



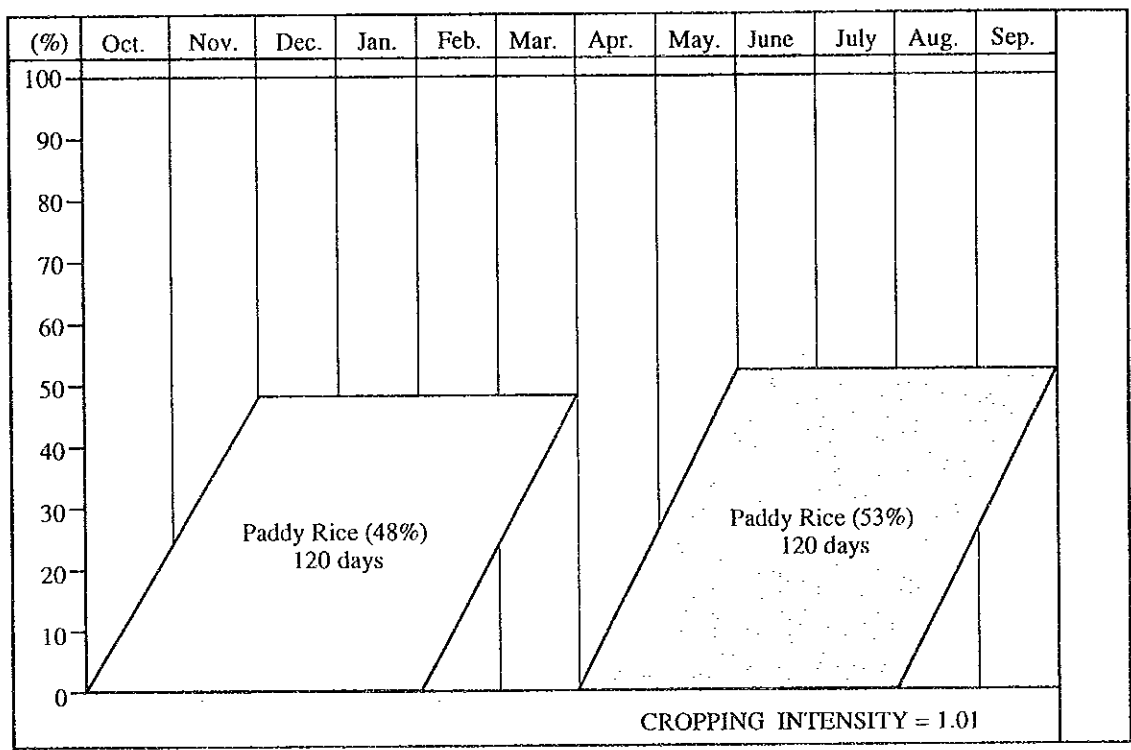
**Proposed Cropping Pattern**

**Figure A-18**

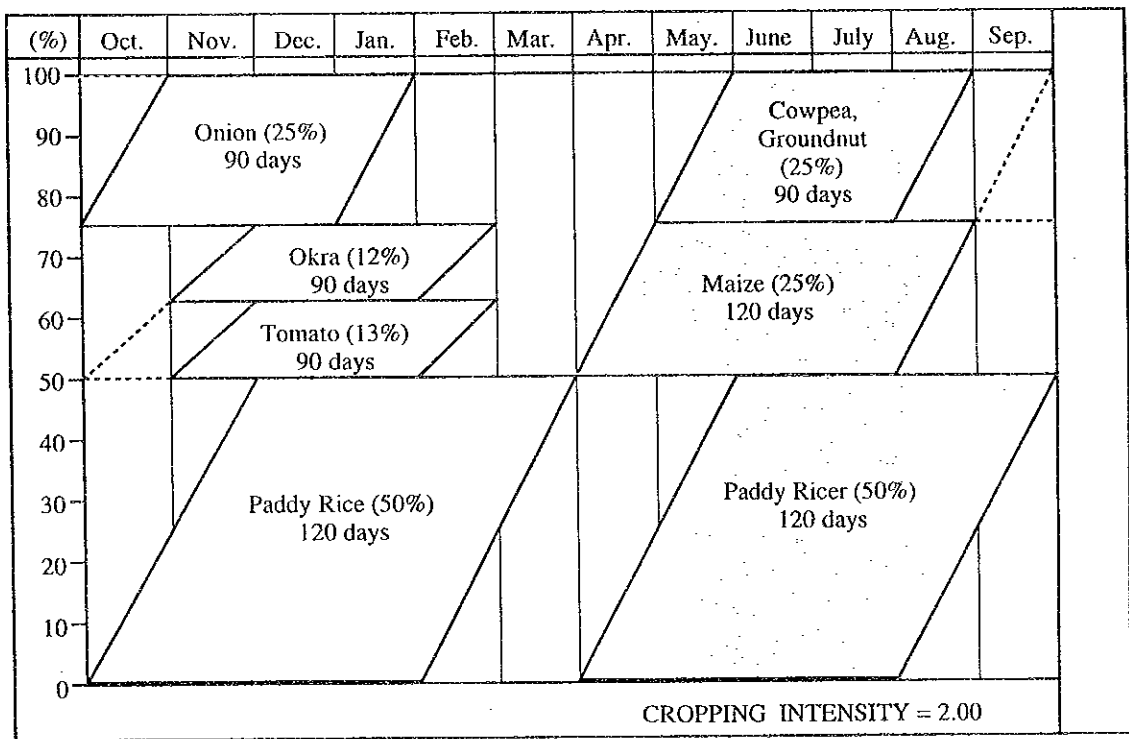
**Present and Proposed Cropping  
Pattern in Afife Project**

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

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**Present Cropping Pattern**



**Proposed Cropping Pattern**

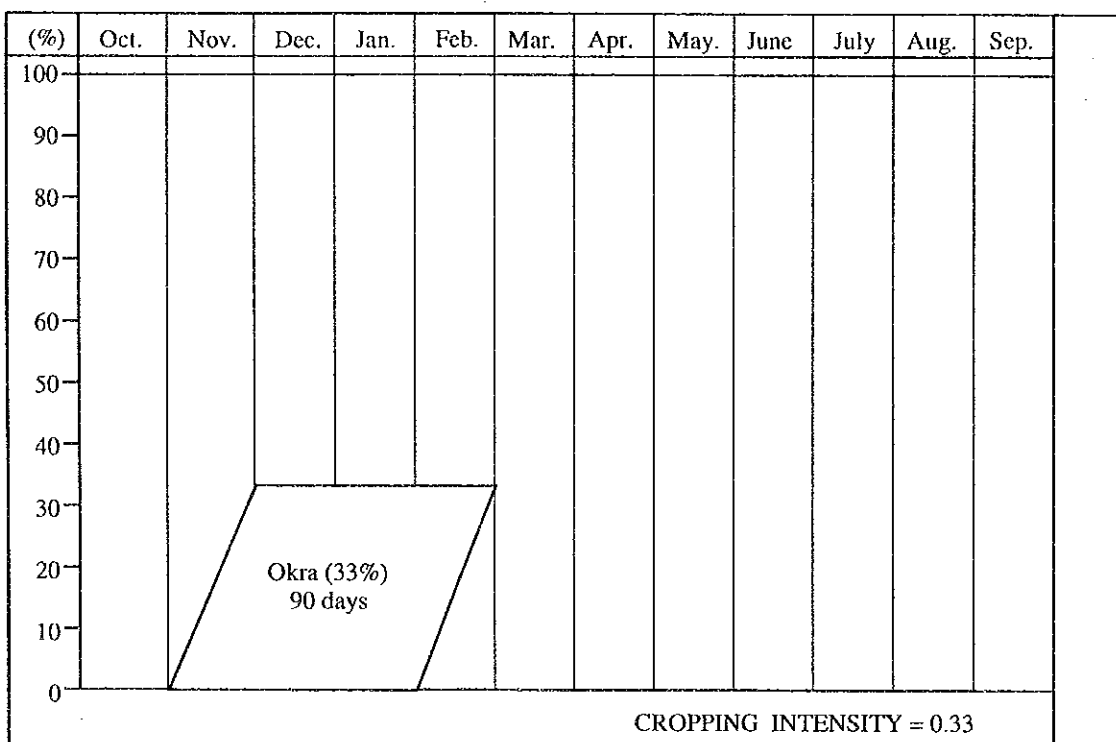
**Figure A-19**

**Present and Proposed Cropping Pattern in Aveyime Project**

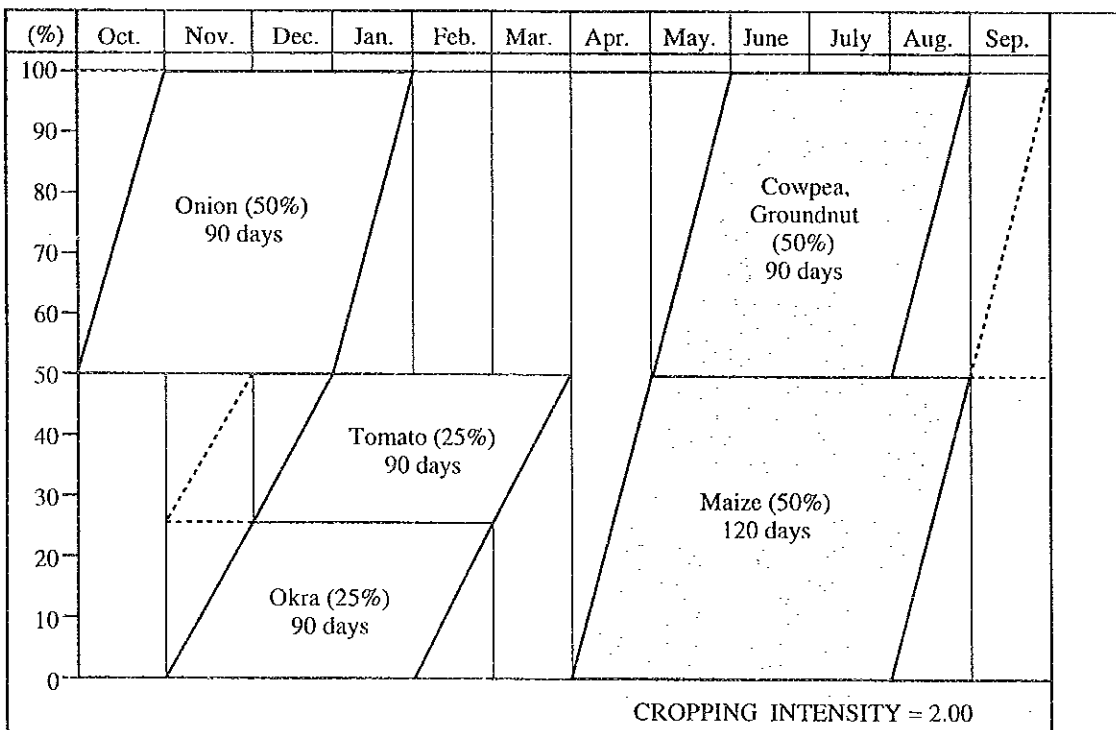
**THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA**

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**Present Cropping Pattern**



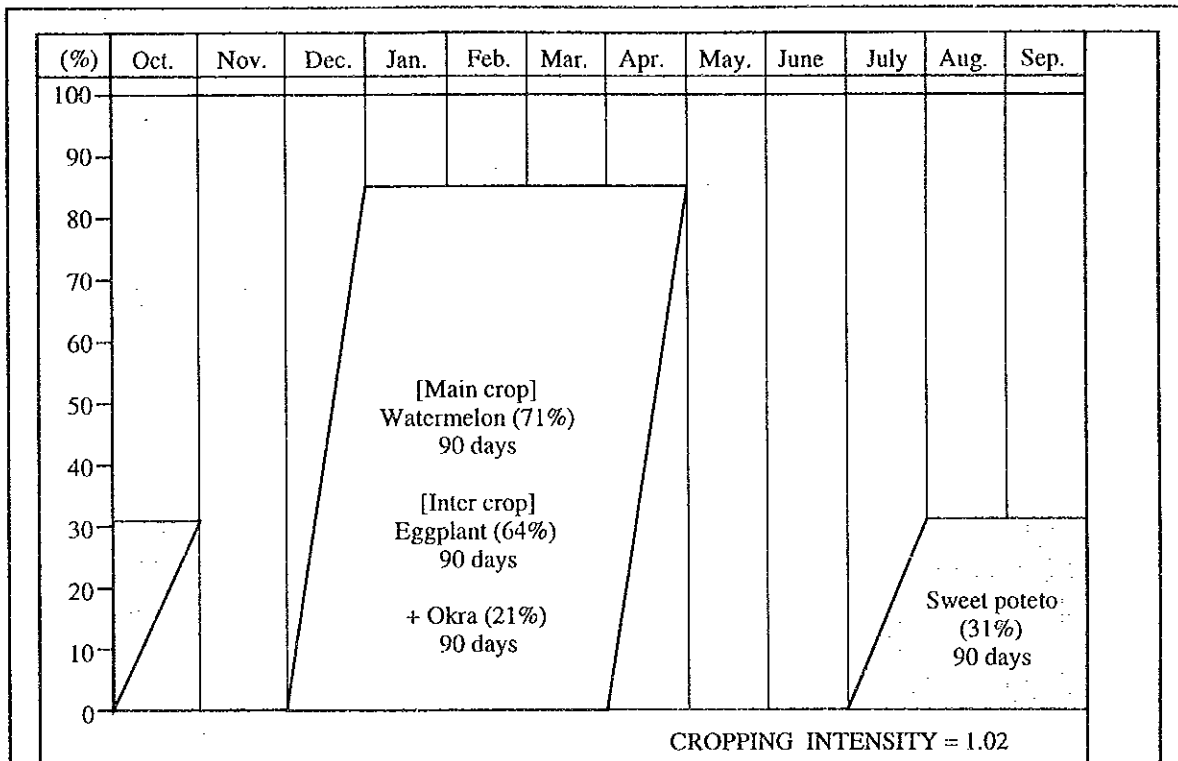
**Proposed Cropping Pattern**

**Figure A-20**

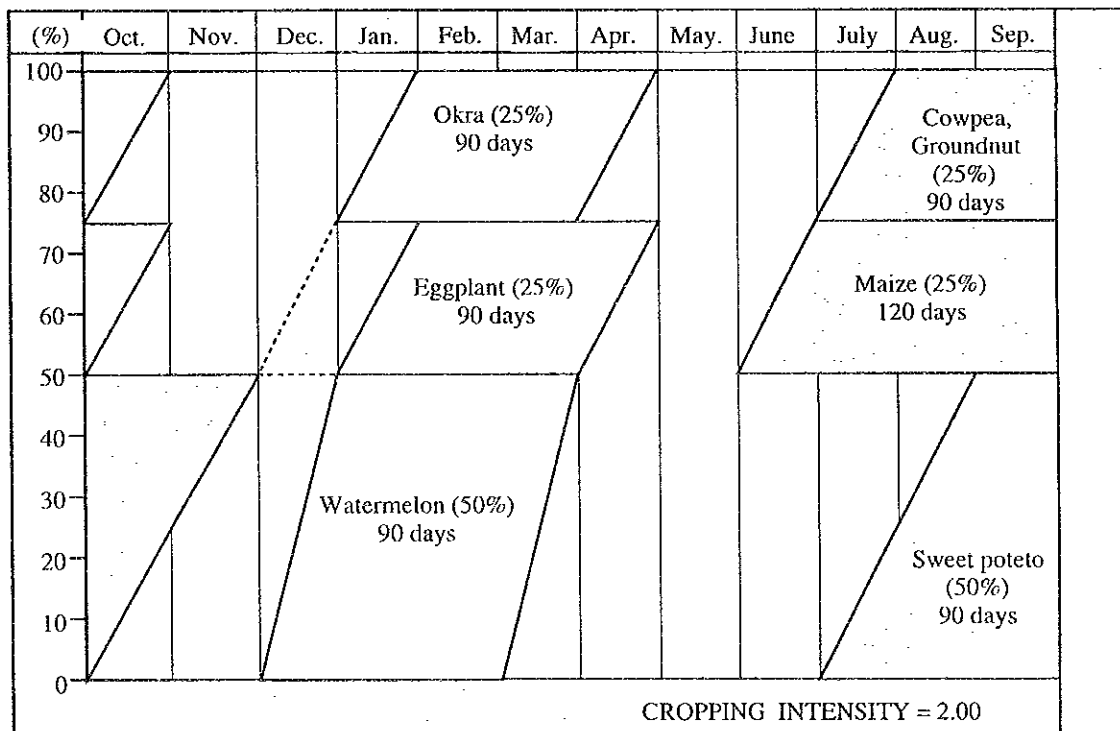
**Present and Proposed Cropping Pattern in Kpando-Torkor Project**

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

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**Present Cropping Pattern**



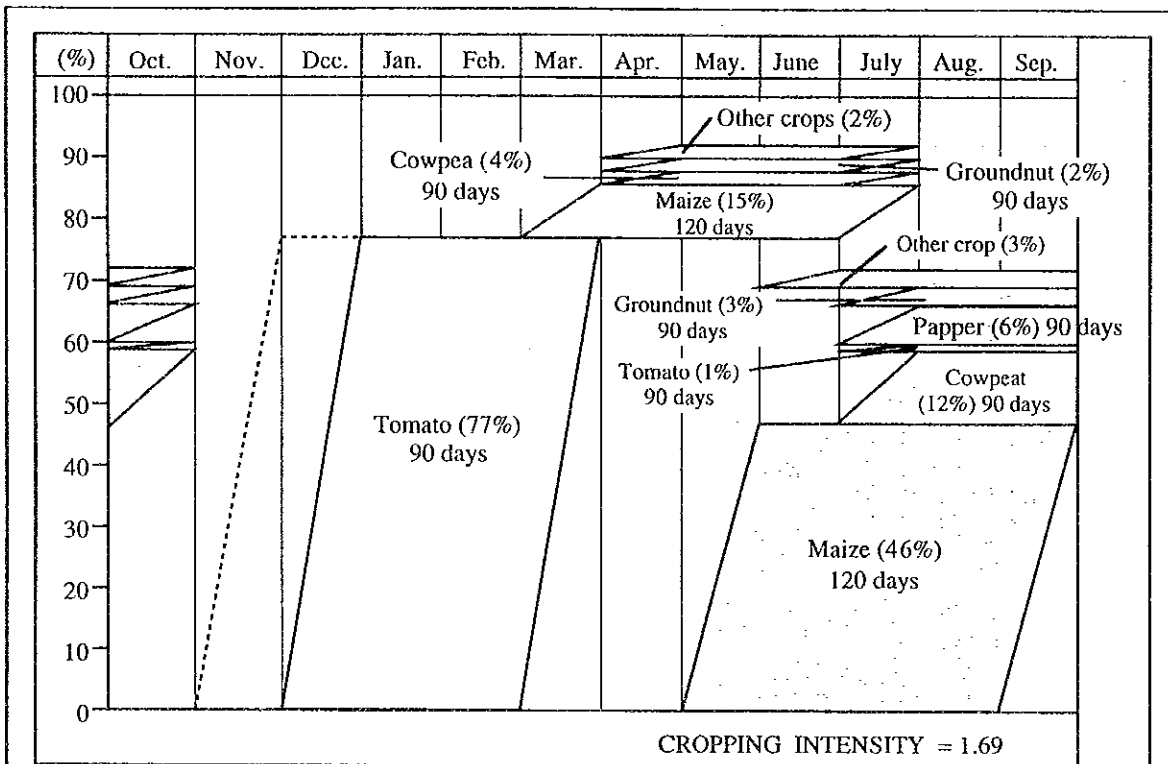
**Proposed Cropping Pattern**

**Figure A-21**

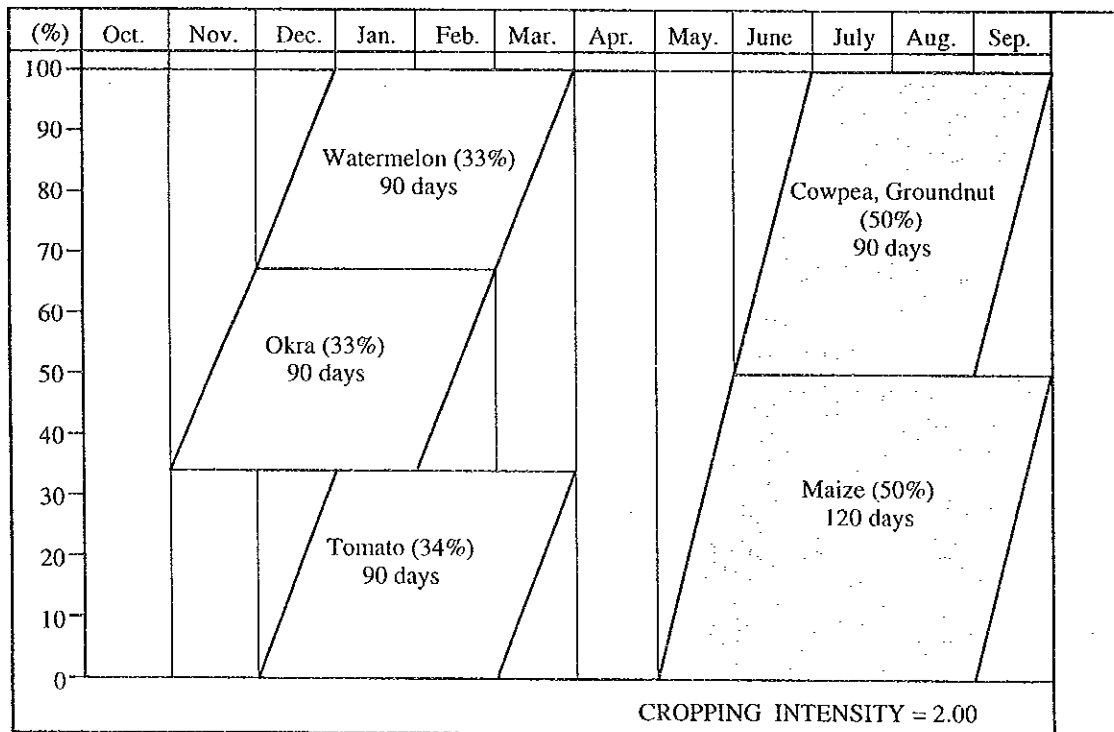
**Present and Proposed Cropping Pattern in Mankessim Project**

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OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA

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**Present Cropping Pattern**



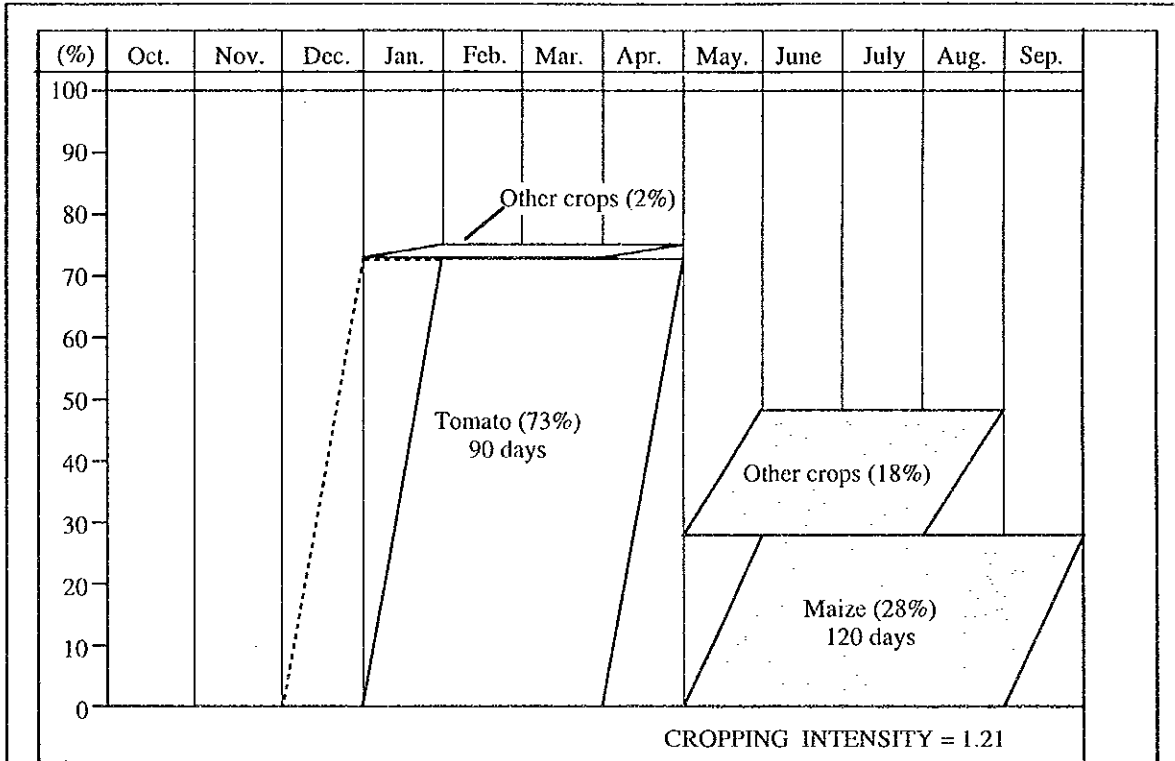
**Proposed Cropping Pattern**

**Figure A-22**

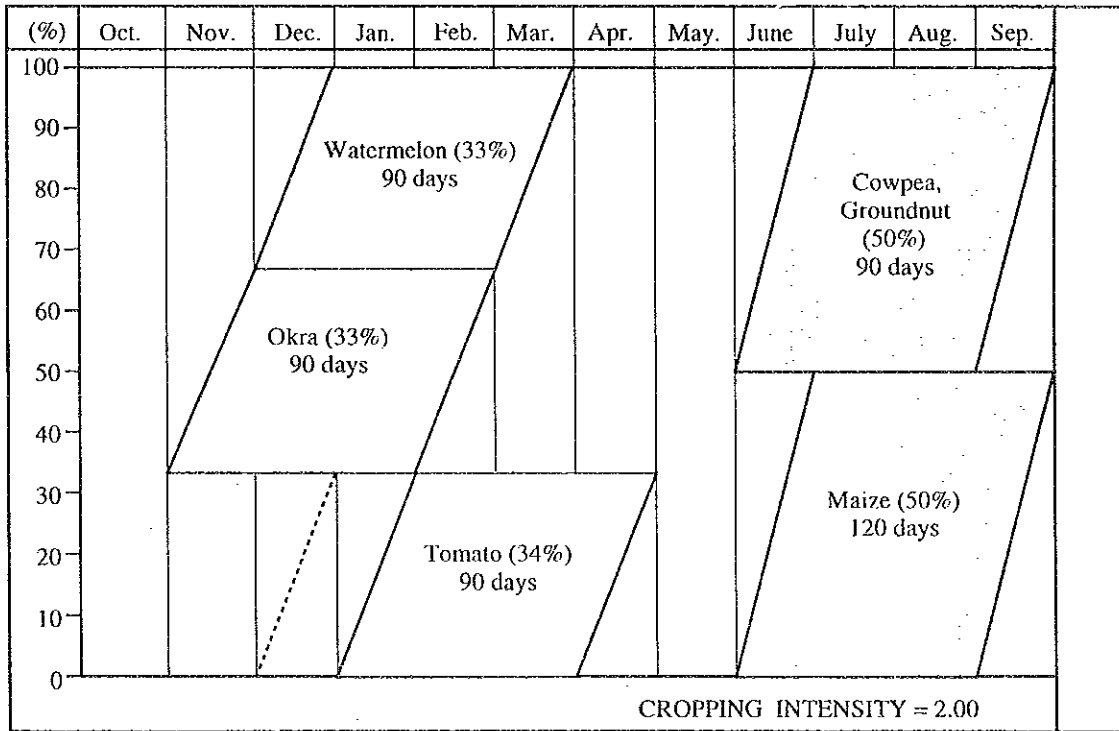
**Present and Proposed Cropping Pattern in Akumadan Project**

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**Present Cropping Pattern**



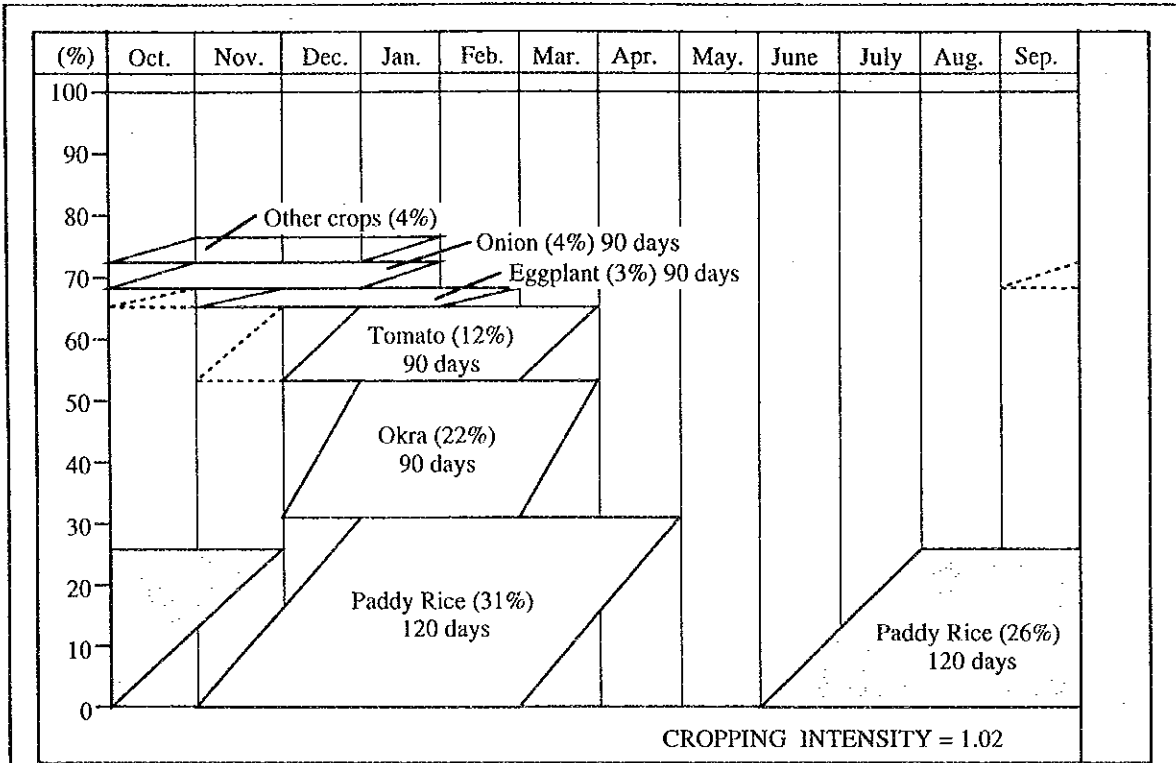
**Proposed Cropping Pattern**

**Figure A-23**

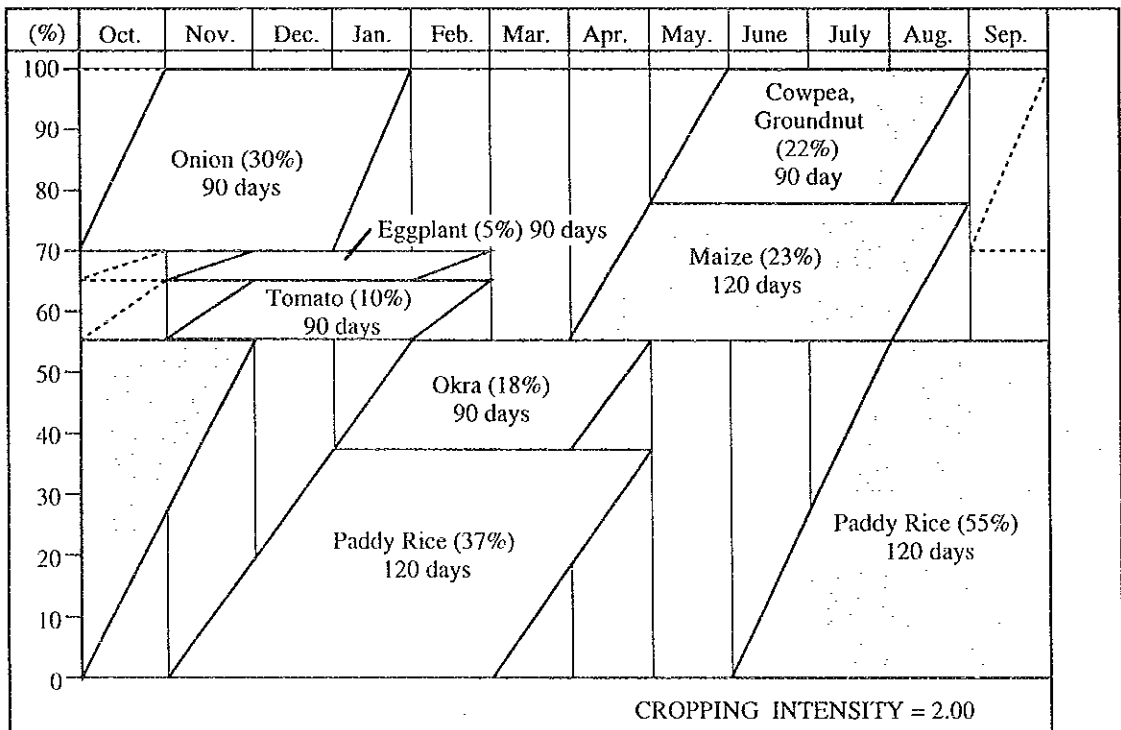
**Present and Proposed Cropping Pattern in Tanoso Project**

**THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA**

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**Present Cropping Pattern**



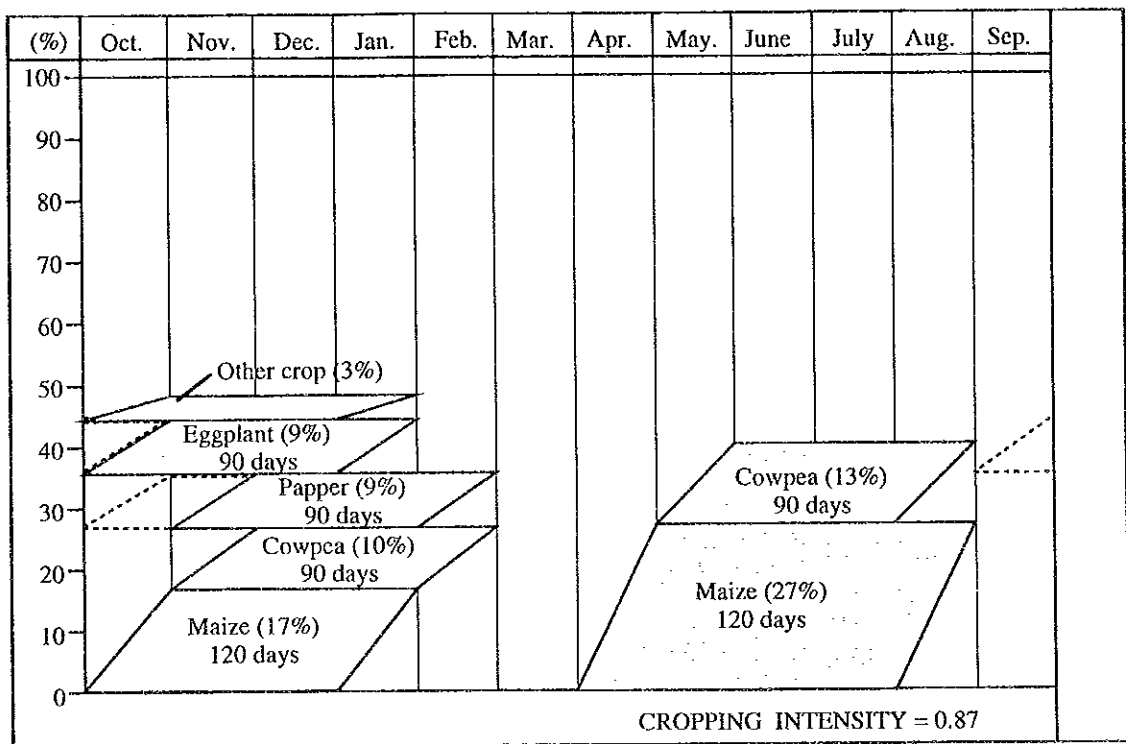
**Proposed Cropping Pattern**

**Figure A-24**

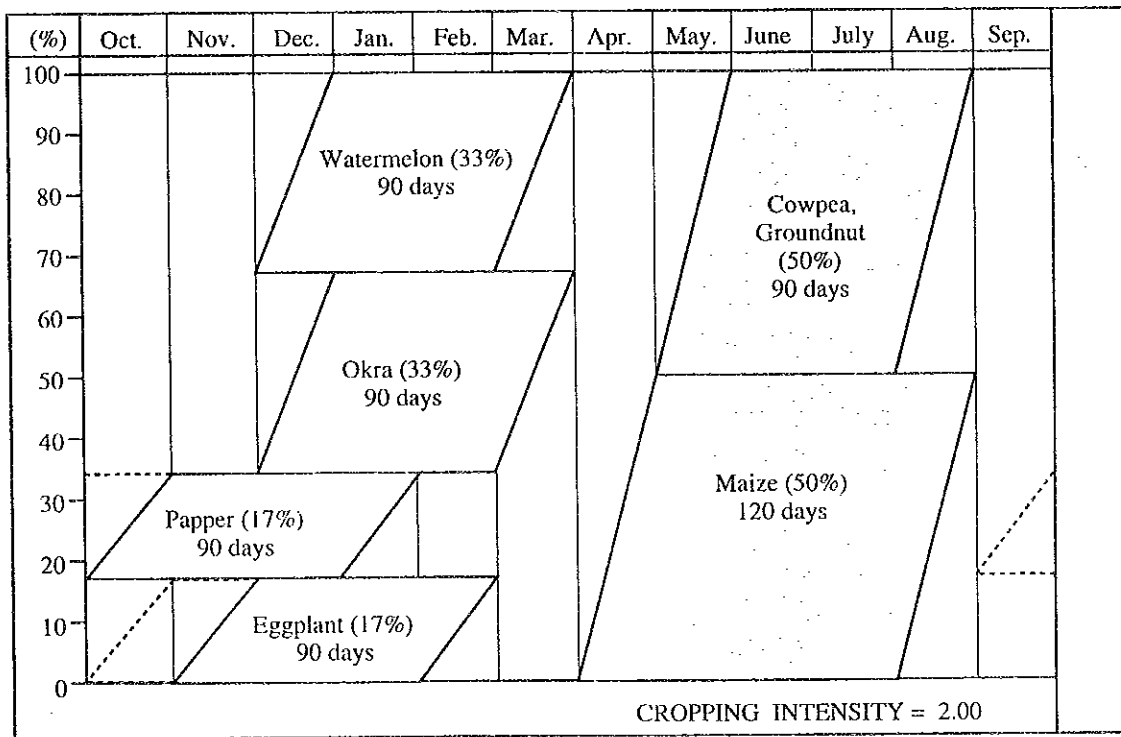
**Present and Proposed Cropping  
Pattern in Bontanga Project**

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

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**Present Cropping Pattern**



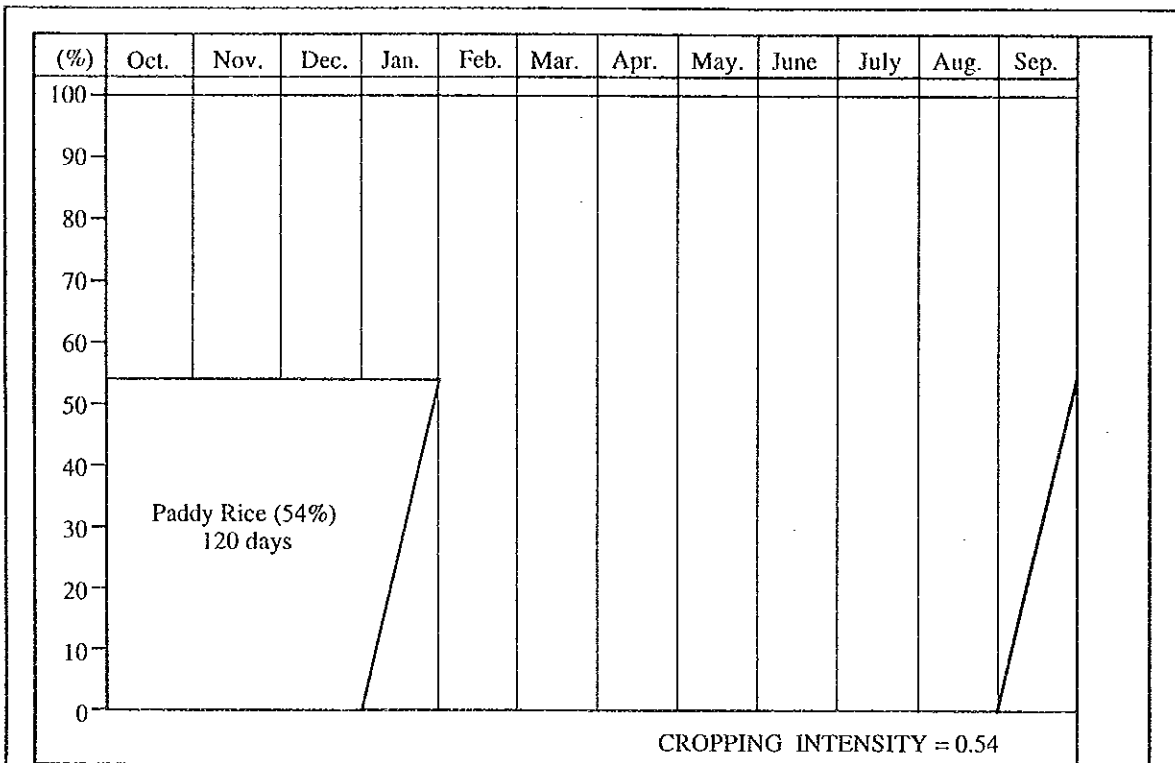
**Proposed Cropping Pattern**

**Figure A-25**

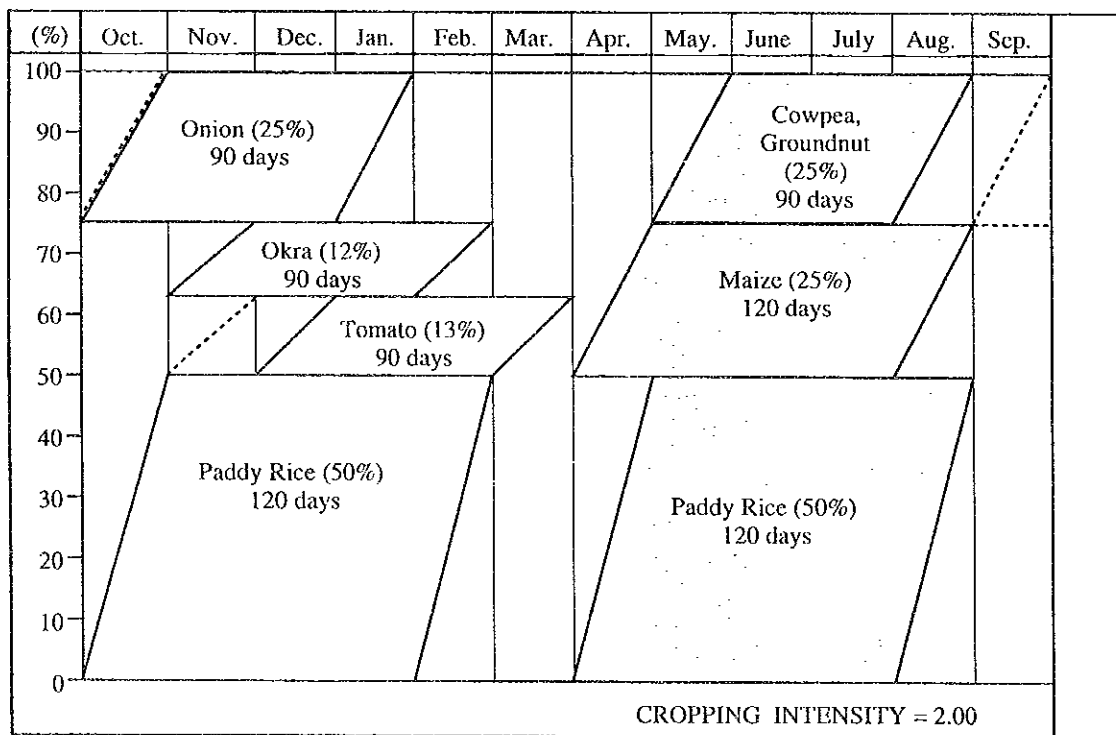
**Present and Proposed Cropping Pattern in Subinja Project**

**THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA**

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**Present Cropping Pattern**



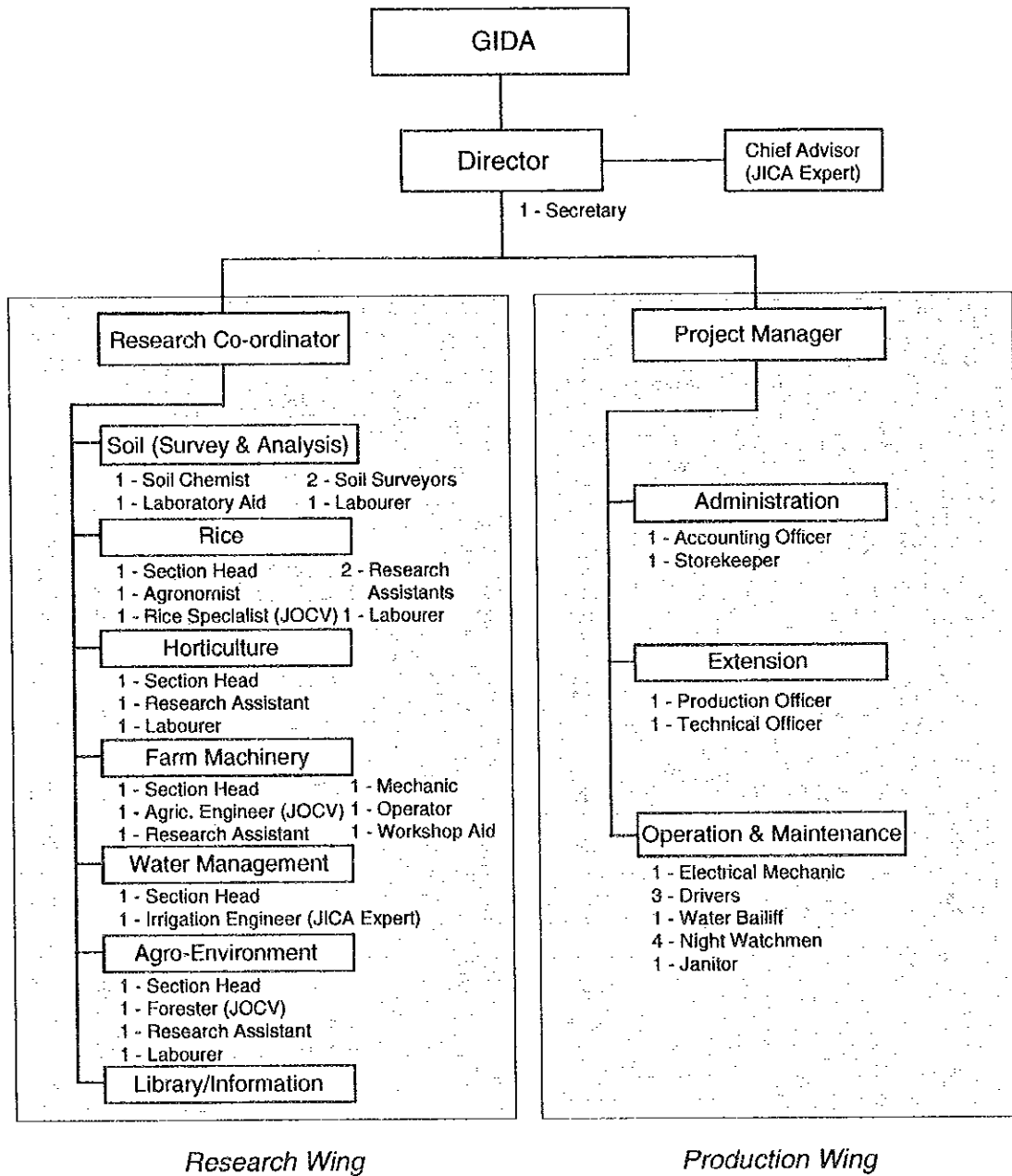
**Proposed Cropping Pattern**

**Figure A-26**

**Present and Proposed Cropping Pattern in Okyereko Project**

**THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA**

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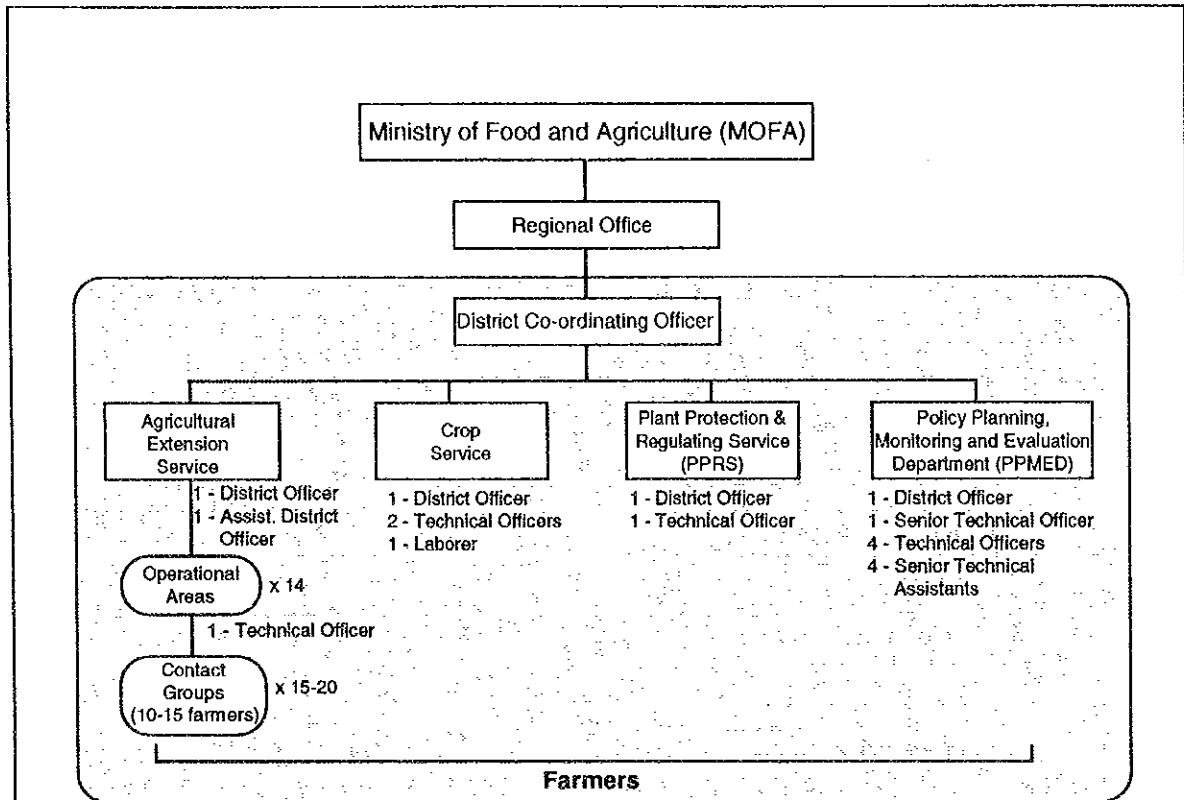


**Figure A-27**  
**Organisational Structure and Staffing of**  
**Irrigation Development Centre (IDC)**

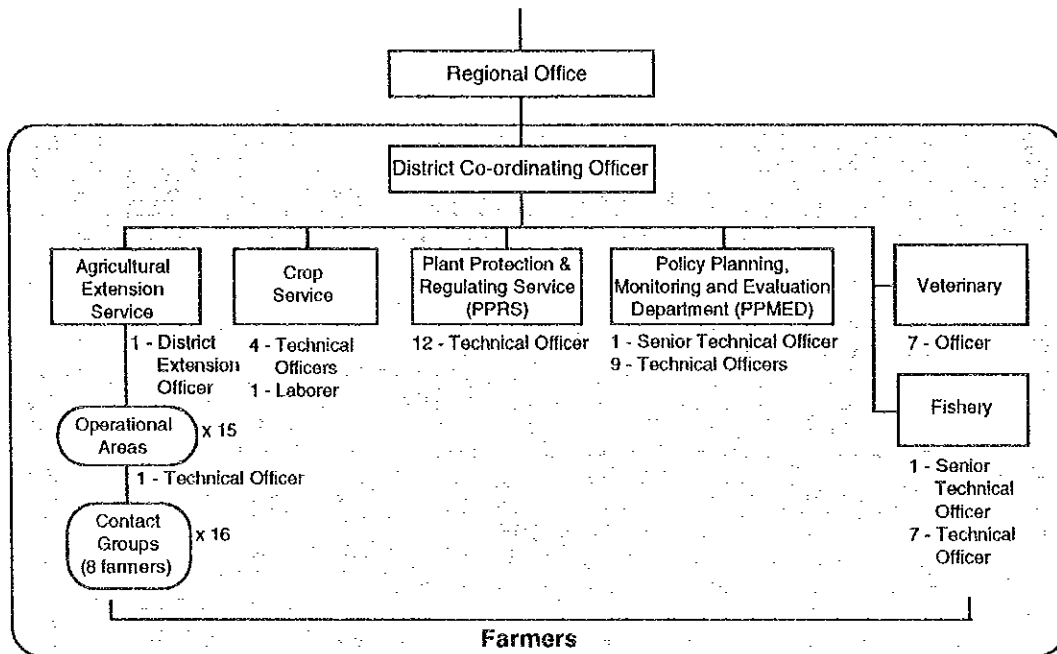
**THE STUDY ON THE REHABILITATION**  
**OF IRRIGATION PROJECTS**  
**IN THE REPUBLIC OF GHANA**

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*Offices of Agricultural Supporting Services in Techiman District*



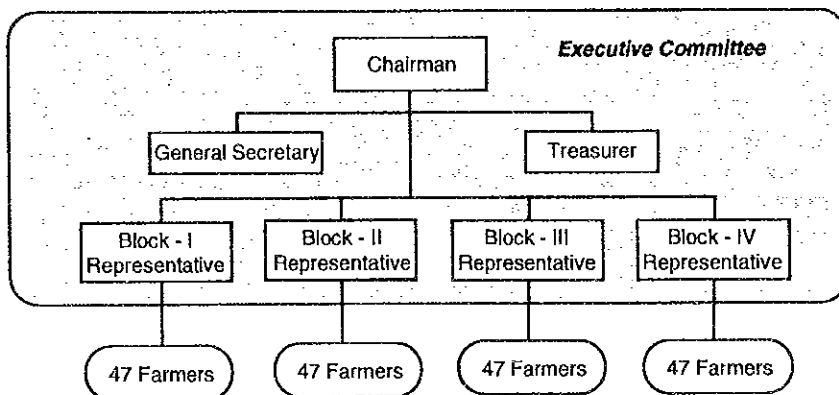
*Offices of Agricultural Supporting Services in Denu District*

**Figure A-28**  
**Organisational Structure of Agricultural Support Services by Ministry of Food and Agriculture (MOFA)**

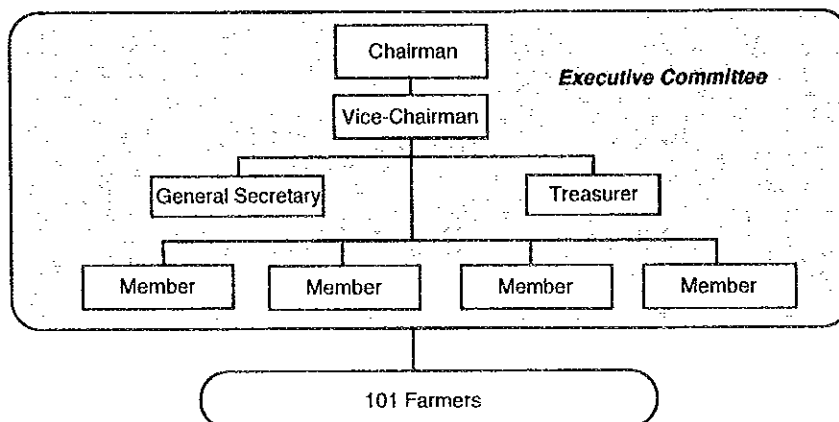
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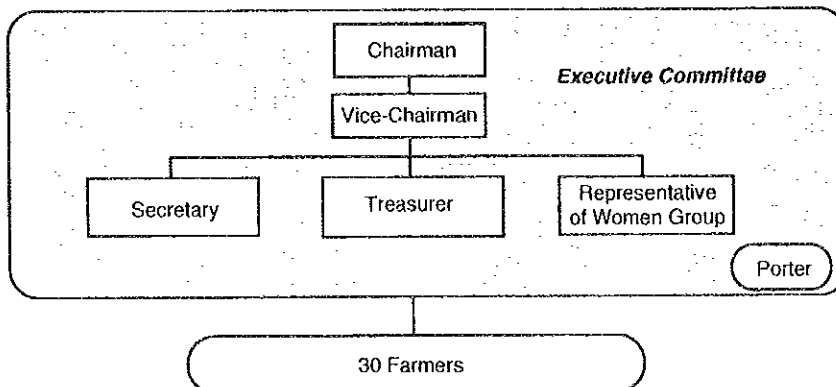
**Tanoso Co-operative Food Farmers and Marketing Society Ltd.**



**Akumadan Co-operative Food Farmers and Marketing Society Ltd.**



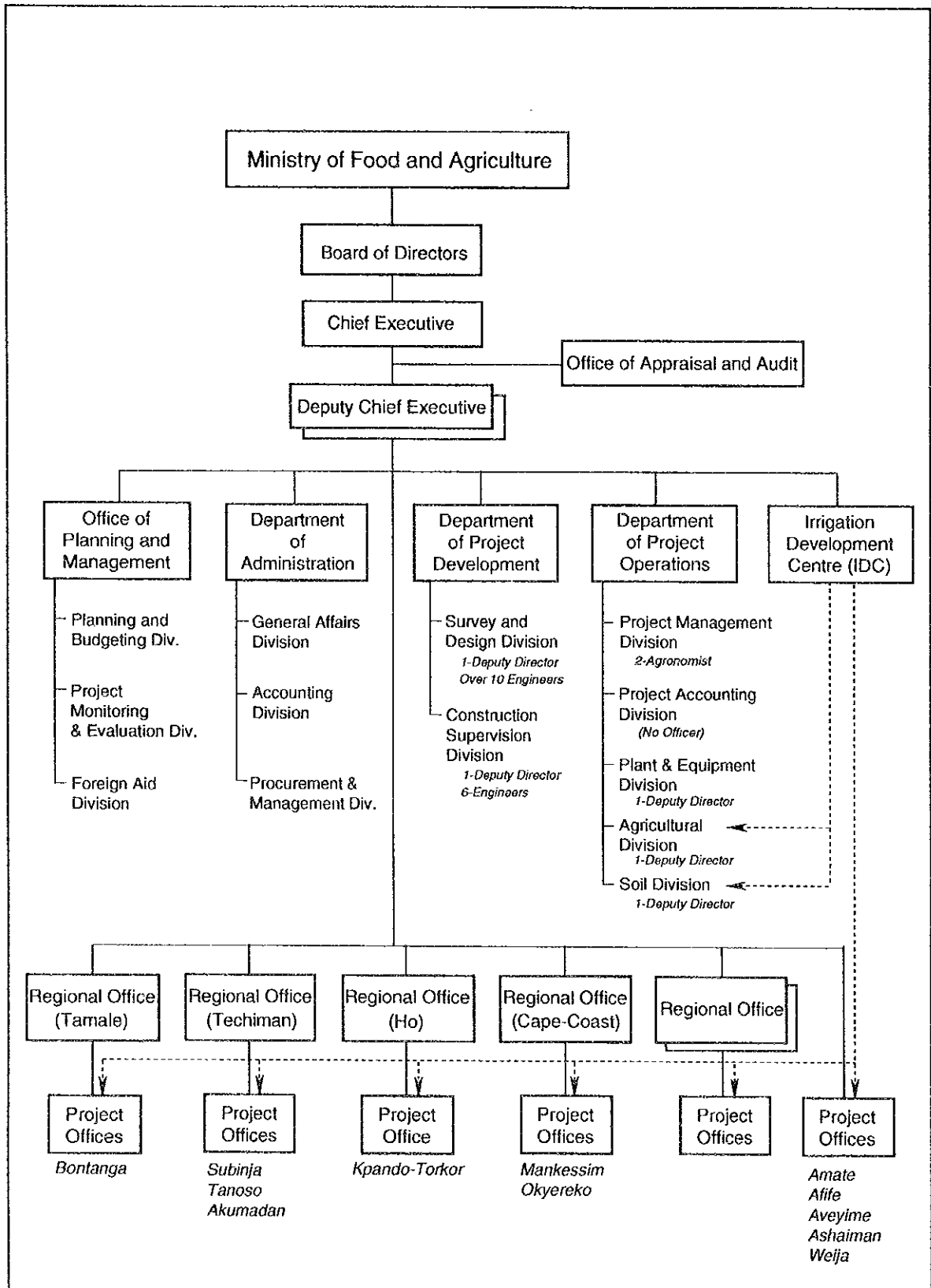
**Subinja Irrigation Farmers' Co-operative Ltd.**



**Figure A-29**  
**Organisational Structure of Farmer's Societies**

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OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

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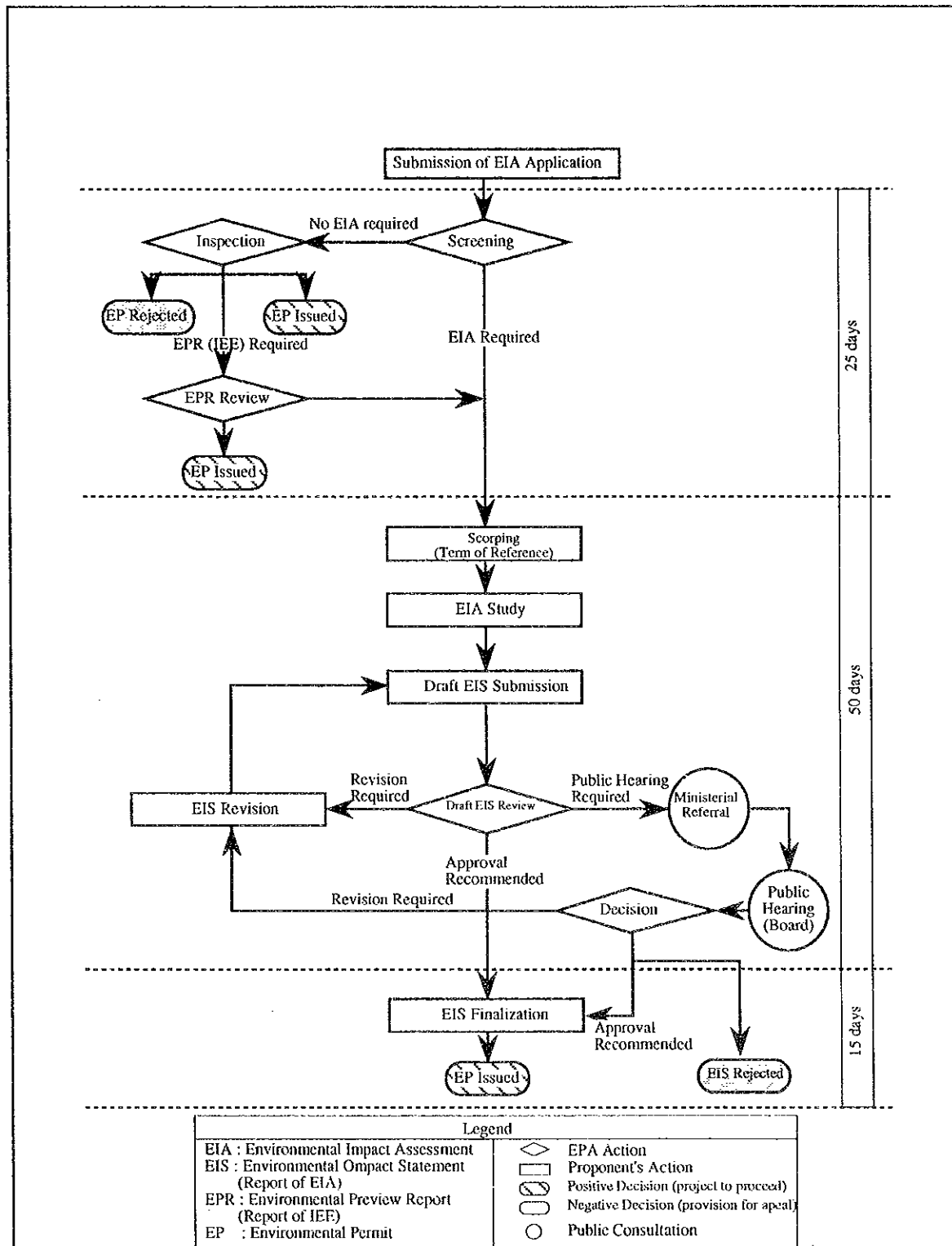


Note: As of December 1995 Source: GIDA Head Office

**Figure A-30**  
Existing Organisational Structure of Ghana  
Irrigation Development Authority (GIDA)

**THE STUDY ON THE REHABILITATION  
OF IRRIGATION PROJECTS  
IN THE REPUBLIC OF GHANA**

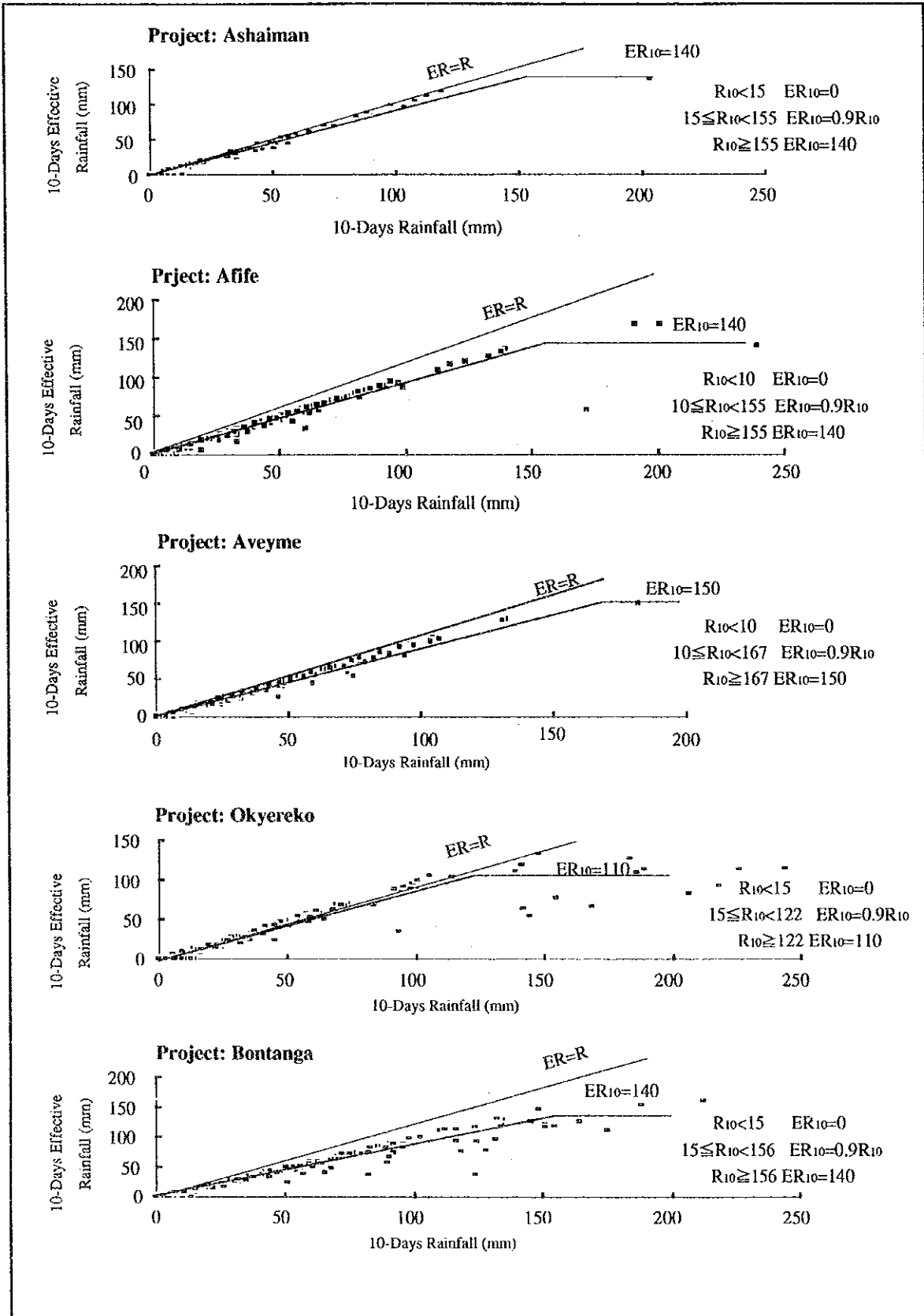
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**Figure A-31**  
**EIA Procedure in Ghana**

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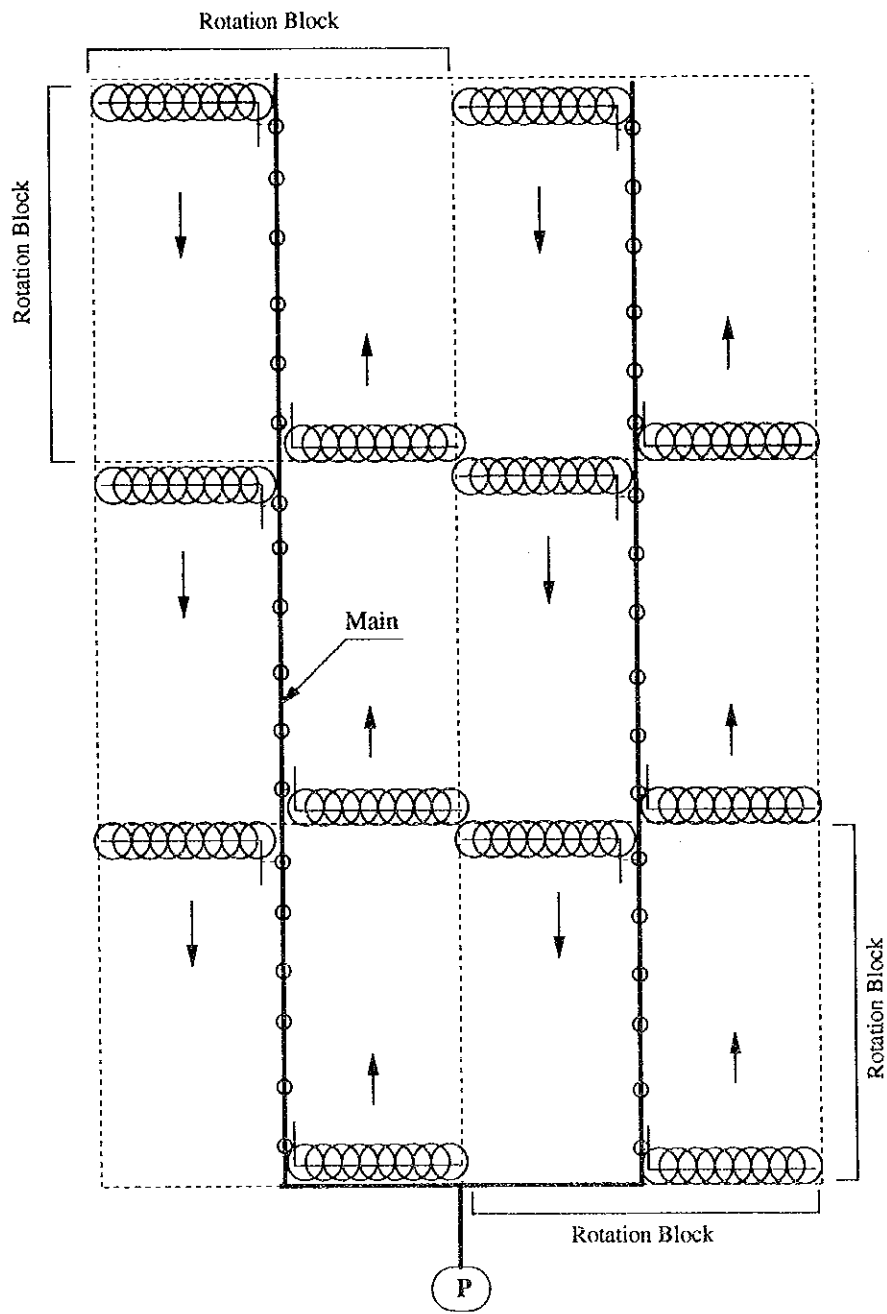
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**Figure A-32**  
**Co-relation of 10-Days Rainfall and Effective Rainfall**

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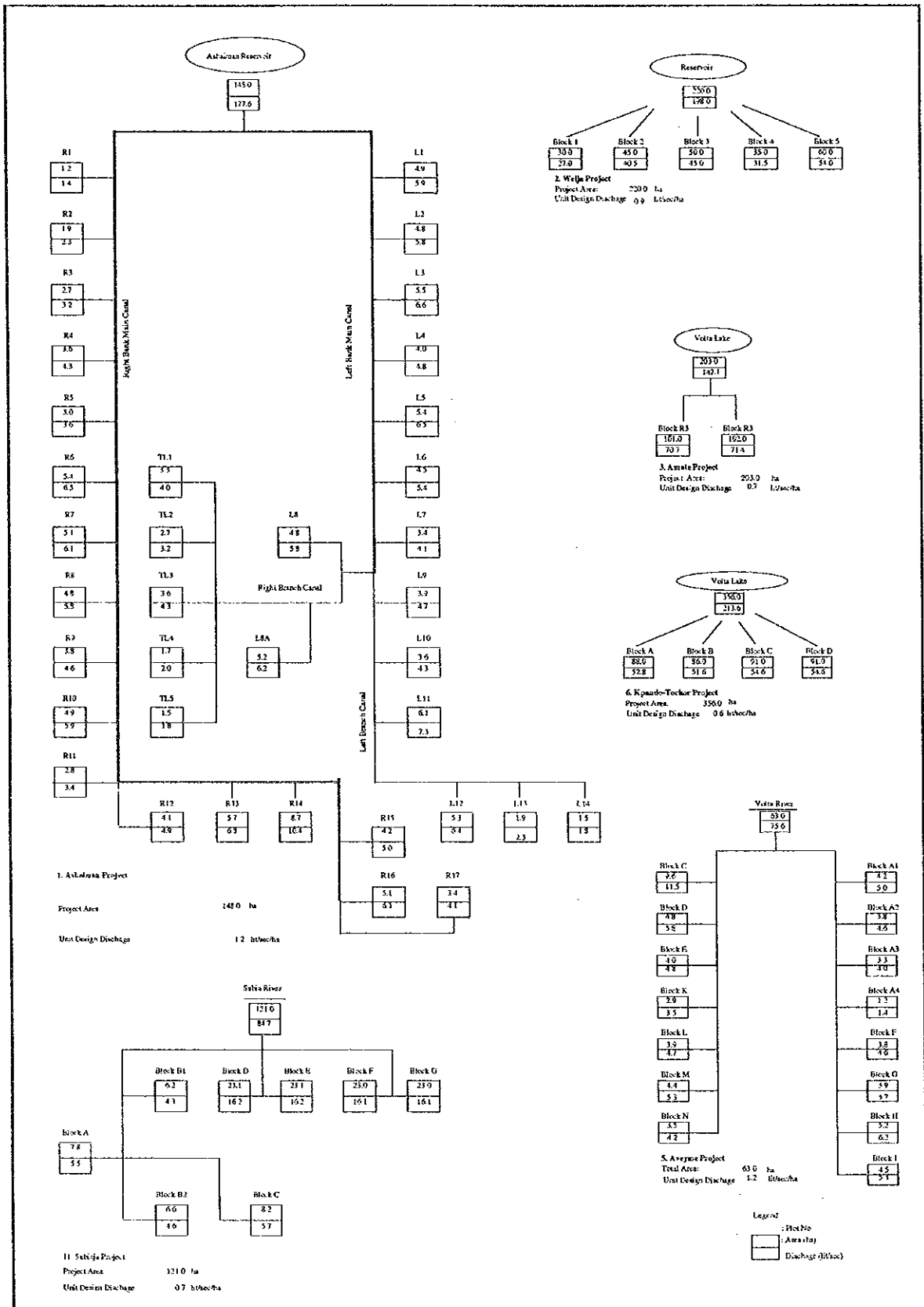


- ⊙ P : Pump Station
- : Main (Burried)
- ⋯ : Rotation Block

**Figure A-33**  
**Typical Sprinkler System**

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 OF IRRIGATION PROJECTS  
 IN THE REPUBLIC OF GHANA**

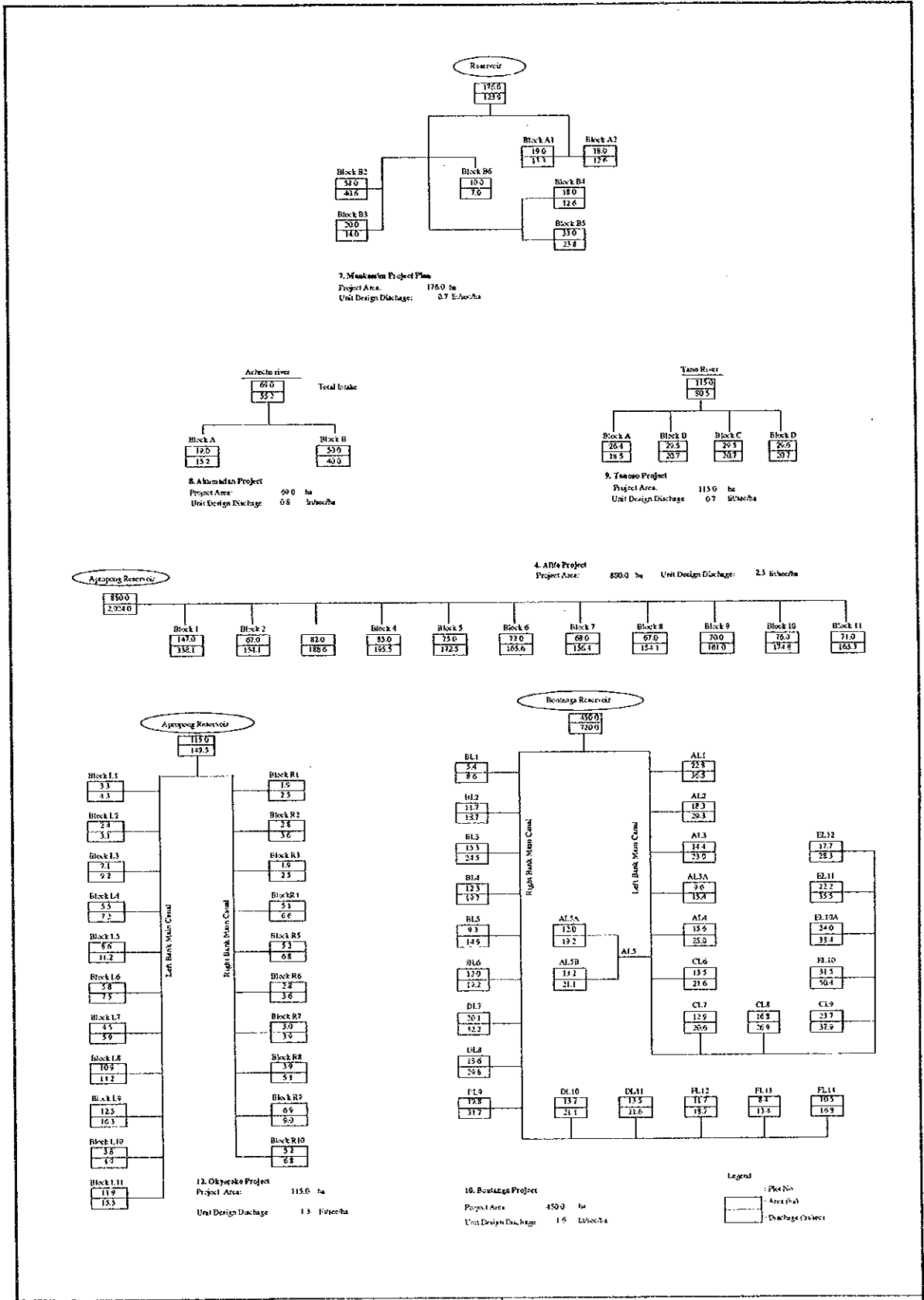
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**Figure A-34**  
**Irrigation Distribution Diagram**  
 (1/2)

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 OF IRRIGATION PROJECTS  
 IN THE REPUBLIC OF GHANA**

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**Figure A-34**  
**Irrigation Distribution Diagram**  
 (2/2)

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 OF IRRIGATION PROJECTS  
 IN THE REPUBLIC OF GHANA**

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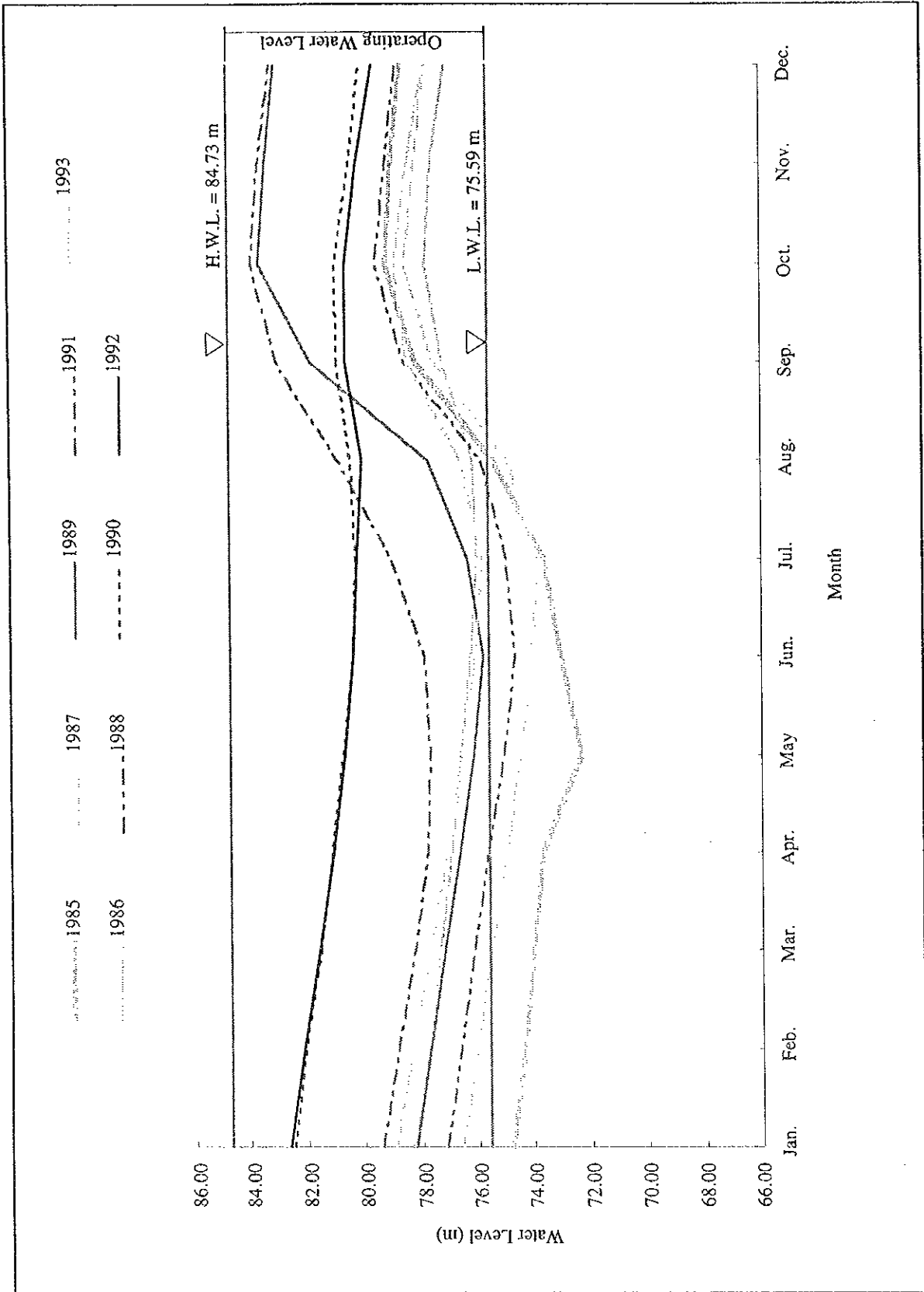


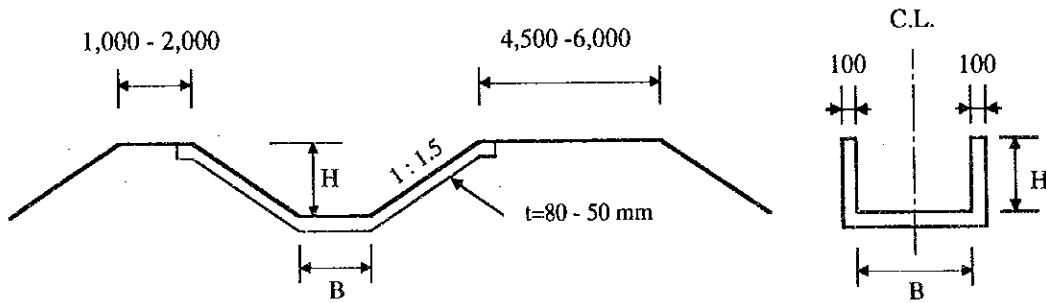
Figure A-35

Water Level Fluctuation of Volta Lake

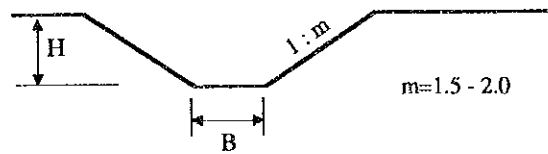
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(1) Concrete Lining Canal

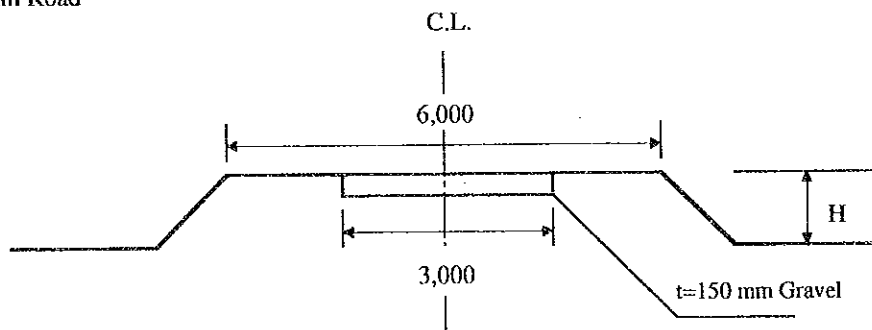


(2) Drain



(3) Farm Road

① Main Road



② Lateral Road

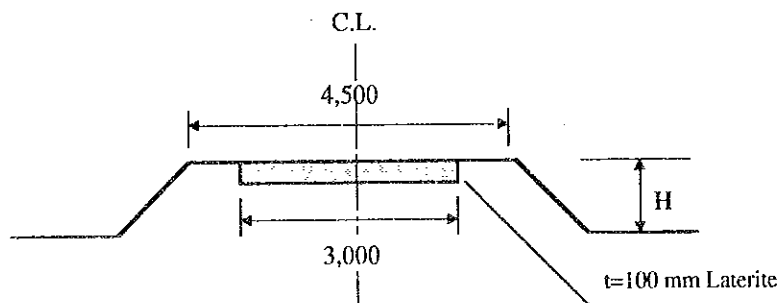


Figure A-36

Applied Typical Cross Section of Canal and Drain

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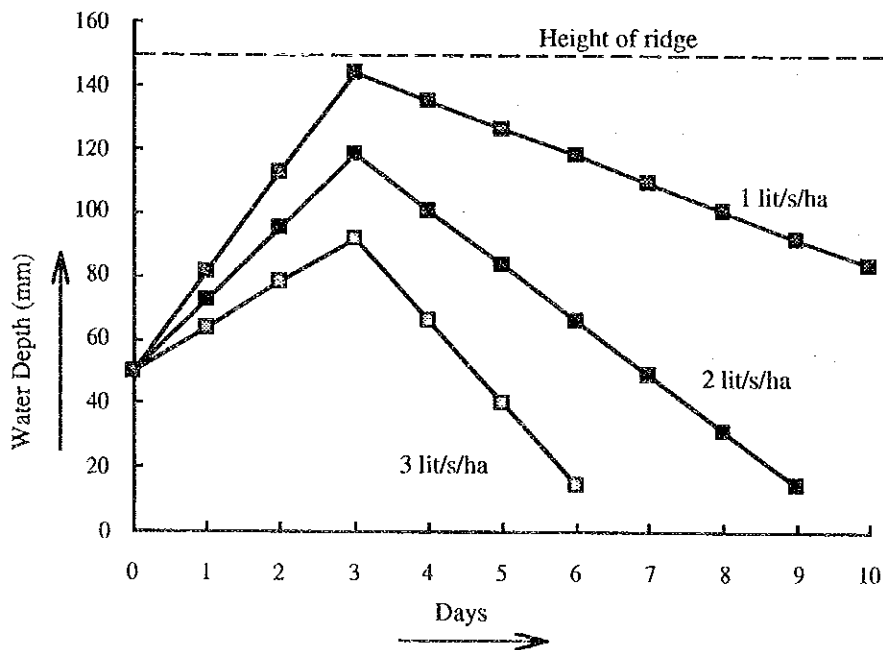
Japan International Cooperation Agency

Design rainfall (Qd) = 120 mm

$Hd = 50 + (Rd \times t)/3.0 - Qd \times t \times 8.64$ , where t is by 3 days

$Hd = 50 + Rd - Qd \times t \times 8.64$ , where t is after 3 days

| (1) Qd = 3 lit/s/ha |        | (2) Qd = 2 lit/s/ha |        | (3) Qd = 1.0 lit/s/ha |        |
|---------------------|--------|---------------------|--------|-----------------------|--------|
| t                   | Hd(mm) | t                   | Hd(mm) | t                     | Hd(mm) |
| 0                   | 50     | 0                   | 50     | 0                     | 50     |
| 1                   | 64     | 1                   | 73     | 1                     | 81     |
| 2                   | 78     | 2                   | 95     | 2                     | 113    |
| 3                   | 92     | 3                   | 118    | 3                     | 144    |
| 4                   | 66     | 4                   | 101    | 4                     | 135    |
| 5                   | 40     | 5                   | 84     | 5                     | 127    |
| 6                   | 14     | 6                   | 66     | 6                     | 118    |
| 7                   |        | 7                   | 49     | 7                     | 110    |
| 8                   |        | 8                   | 32     | 8                     | 101    |
| 9                   |        | 9                   | 14     | 9                     | 92     |
| 10                  |        | 10                  |        | 10                    | 84     |



**Figure A-37**  
**Estimate on Internal Drainage Requirement for Ashaiman Project**

**THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA**

Japan International Cooperation Agency

Design rainfall (Qd) = 170 mm

$Hd = 50 + (Rd \times t)/3.0 - Qd \times t \times 8.64$ , where t is by 3 days

$Hd = 50 + Rd - Qd \times t \times 8.64$ , where t is after 3 days

| (1) Qd = 3 lit/s/ha |        | (2) Qd = 2 lit/s/ha |        | (3) Qd = 1.0 lit/s/ha |        |
|---------------------|--------|---------------------|--------|-----------------------|--------|
| t                   | Hd(mm) | t                   | Hd(mm) | t                     | Hd(mm) |
| 0                   | 50     | 0                   | 50     | 0                     | 50     |
| 1                   | 81     | 1                   | 89     | 1                     | 98     |
| 2                   | 111    | 2                   | 129    | 2                     | 146    |
| 3                   | 142    | 3                   | 168    | 3                     | 194    |
| 4                   | 116    | 4                   | 151    | 4                     | 185    |
| 5                   | 90     | 5                   | 134    | 5                     | 177    |
| 6                   | 64     | 6                   | 116    | 6                     | 168    |
| 7                   | 39     | 7                   | 99     | 7                     | 160    |
| 8                   | 13     | 8                   | 82     | 8                     | 151    |
| 9                   |        | 9                   | 64     | 9                     | 142    |
| 10                  |        | 10                  | 47     | 10                    | 134    |

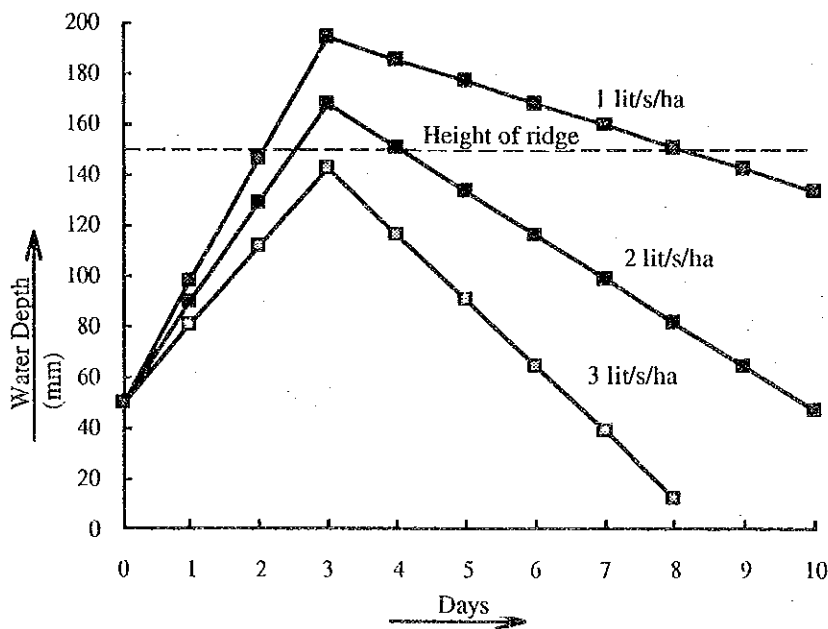


Figure A-38

Estimate on Internal Drainage Requirement for Afife Project

THE STUDY ON THE REHABILITATION OF IRRIGATION PROJECTS IN THE REPUBLIC OF GHANA

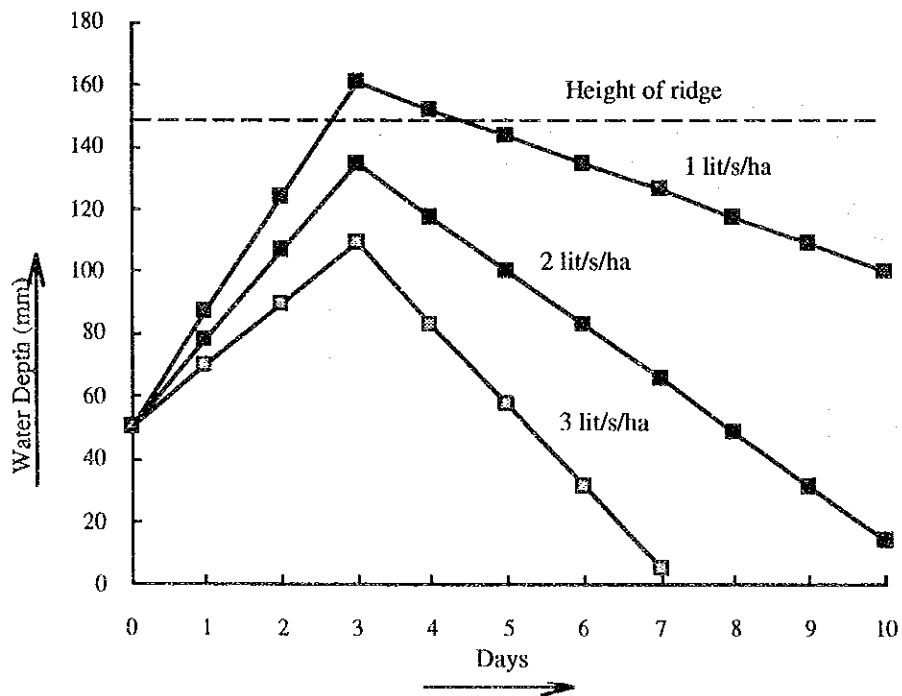
Japan International Cooperation Agency

Design rainfall (Qd) = 137 mm

$Hd = 50 + (Rd \times t)/3.0 - Qd \times t \times 8.64$ , where t is by 3 days

$Hd = 50 + Rd - Qd \times t \times 8.64$ , where t is after 3 days

| (1) Qd = 3 lit/s/ha |        | (2) Qd = 2 lit/s/ha |        | (3) Qd = 1.0 lit/s/ha |        |
|---------------------|--------|---------------------|--------|-----------------------|--------|
| t                   | Hd(mm) | t                   | Hd(mm) | t                     | Hd(mm) |
| 0                   | 50     | 0                   | 50     | 0                     | 50     |
| 1                   | 70     | 1                   | 78     | 1                     | 87     |
| 2                   | 89     | 2                   | 107    | 2                     | 124    |
| 3                   | 109    | 3                   | 135    | 3                     | 161    |
| 4                   | 83     | 4                   | 118    | 4                     | 152    |
| 5                   | 57     | 5                   | 101    | 5                     | 144    |
| 6                   | 31     | 6                   | 83     | 6                     | 135    |
| 7                   | 6      | 7                   | 66     | 7                     | 127    |
| 8                   |        | 8                   | 49     | 8                     | 118    |
| 9                   |        | 9                   | 31     | 9                     | 109    |
| 10                  |        | 10                  | 14     | 10                    | 101    |



**Figure A-39**  
**Estimate on Internal Drainage Requirement for Aveyime Project**

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DEsign rainfall (Qd) = 165 mm

$Hd = 50 + (Rd \times t)/3.0 - Qd \times t \times 8.64$ , where t is by 3 days

$Hd = 50 + Rd - Qd \times t \times 8.64$ , where t is after 3 days

(1) Qd = 3 lit/s/ha

(2) Qd = 2 lit/s/ha

(3) Qd = 1.0 lit/s/ha

| t  | Hd(mm) | t  | Hd(mm) | t  | Hd(mm) |
|----|--------|----|--------|----|--------|
| 0  | 50     | 0  | 50     | 0  | 50     |
| 1  | 79     | 1  | 88     | 1  | 96     |
| 2  | 108    | 2  | 125    | 2  | 143    |
| 3  | 137    | 3  | 163    | 3  | 189    |
| 4  | 111    | 4  | 146    | 4  | 180    |
| 5  | 85     | 5  | 129    | 5  | 172    |
| 6  | 59     | 6  | 111    | 6  | 163    |
| 7  | 34     | 7  | 94     | 7  | 155    |
| 8  |        | 8  | 77     | 8  | 146    |
| 9  |        | 9  | 59     | 9  | 137    |
| 10 |        | 10 | 42     | 10 | 129    |

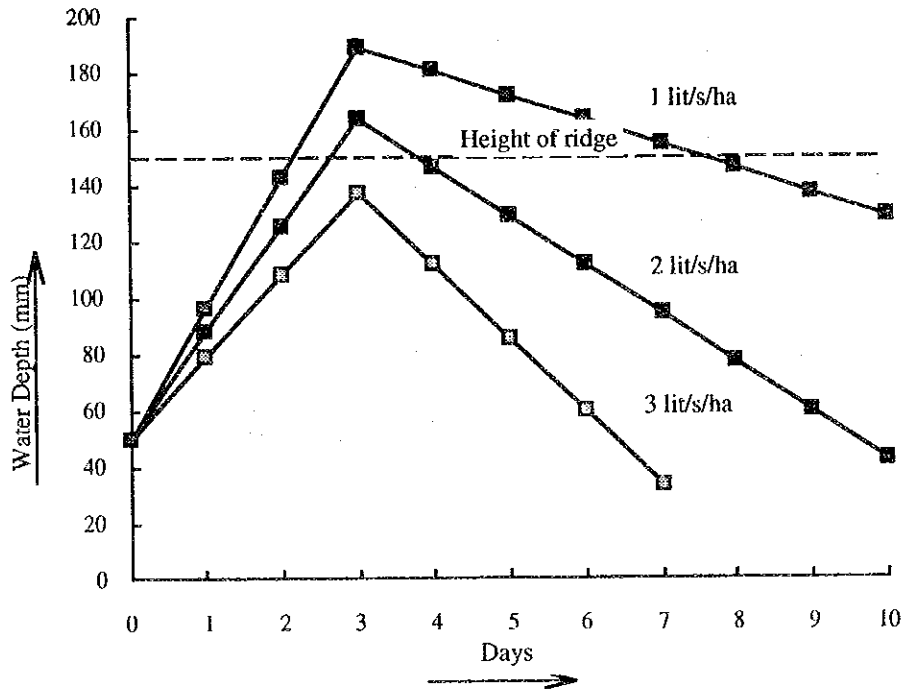


Figure A-40

Estimate on Internal Drainage Requirement for Bontanga Project

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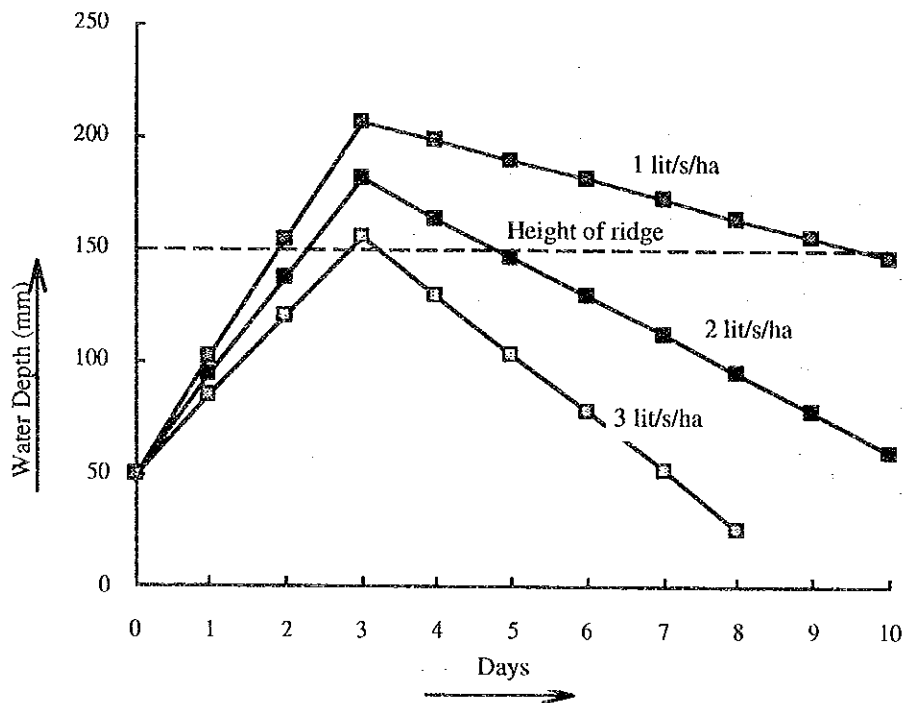
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Design rainfall (Qd) = 183 mm

$Hd = 50 + (Rd \times t)/3.0 - Qd \times t \times 8.64$ , where t is by 3 days

$Hd = 50 + Rd - Qd \times t \times 8.64$ , where t is after 3 days

| (1) Qd = 3 lit/s/ha |        | (2) Qd = 2 lit/s/ha |        | (3) Qd = 1.0 lit/s/ha |        |
|---------------------|--------|---------------------|--------|-----------------------|--------|
| t                   | Hd(mm) | t                   | Hd(mm) | t                     | Hd(mm) |
| 0                   | 50     | 0                   | 50     | 0                     | 50     |
| 1                   | 85     | 1                   | 94     | 1                     | 102    |
| 2                   | 120    | 2                   | 137    | 2                     | 155    |
| 3                   | 155    | 3                   | 181    | 3                     | 207    |
| 4                   | 129    | 4                   | 164    | 4                     | 198    |
| 5                   | 103    | 5                   | 147    | 5                     | 190    |
| 6                   | 77     | 6                   | 129    | 6                     | 181    |
| 7                   | 52     | 7                   | 112    | 7                     | 173    |
| 8                   | 26     | 8                   | 95     | 8                     | 164    |
| 9                   |        | 9                   | 77     | 9                     | 155    |
| 10                  |        | 10                  | 60     | 10                    | 147    |



**Figure A-41**  
**Estimate on Internal Drainage Requirement for Okyereko Project**

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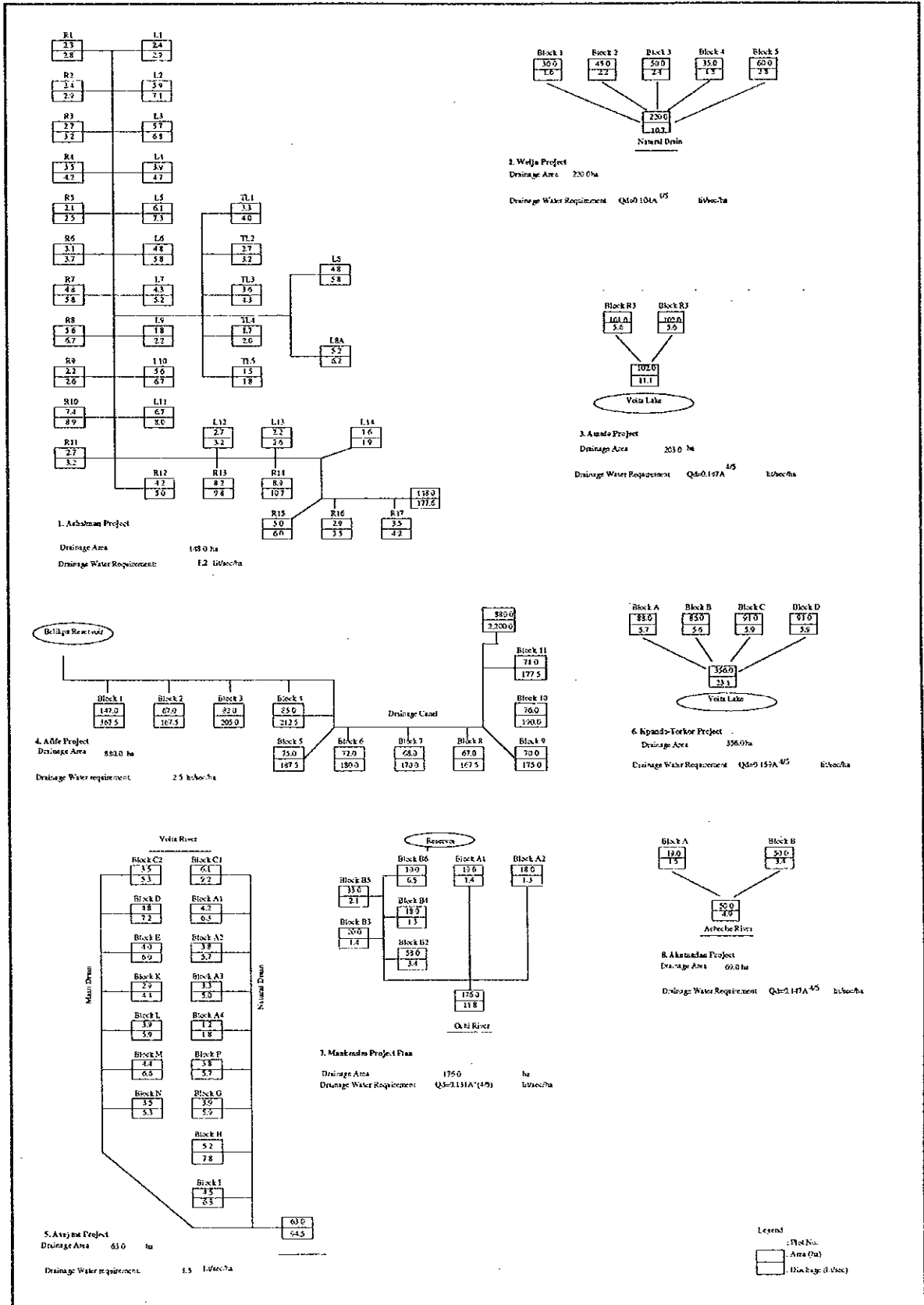


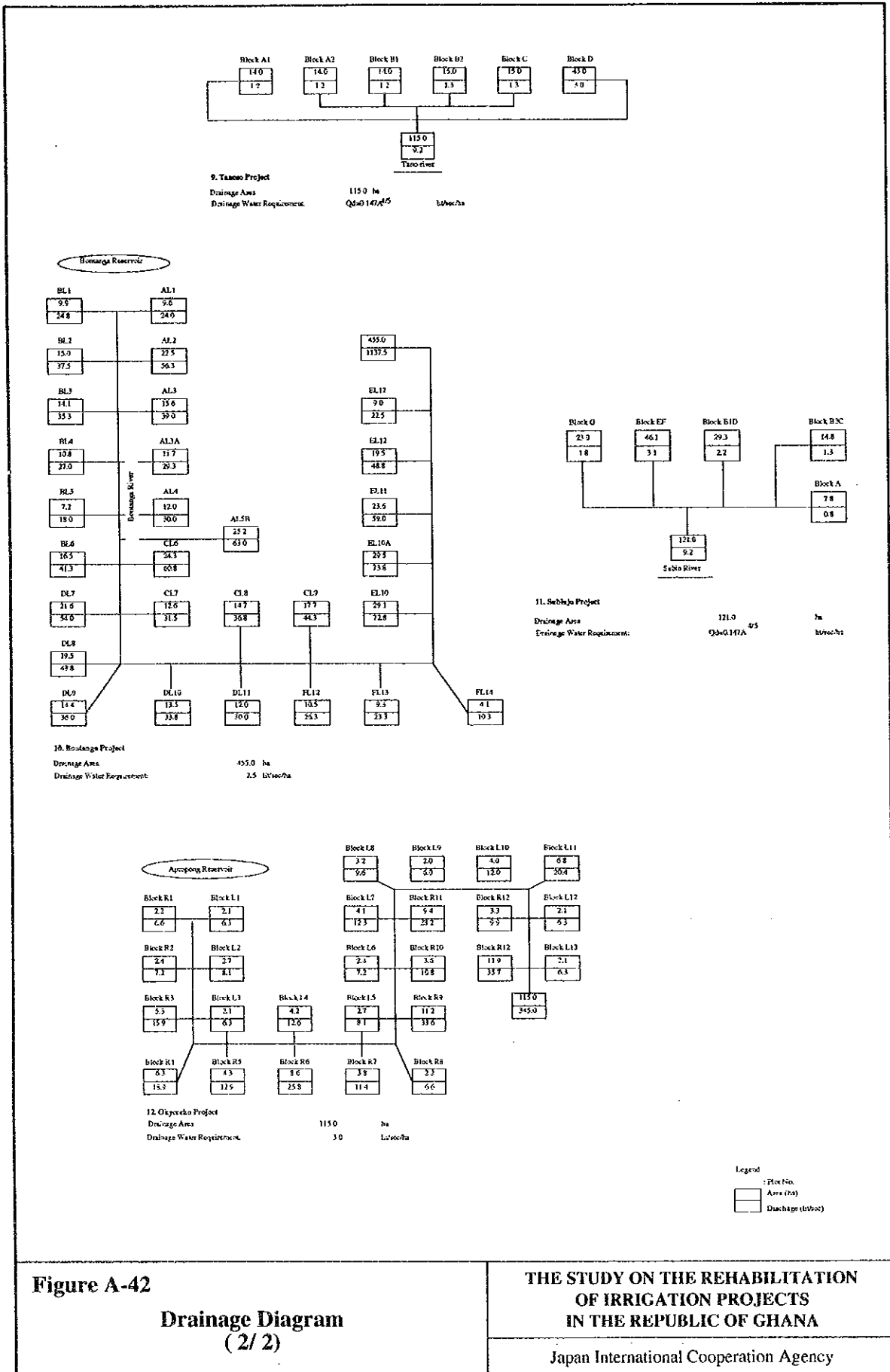
Figure A-42

Drainage Digram (1/2)

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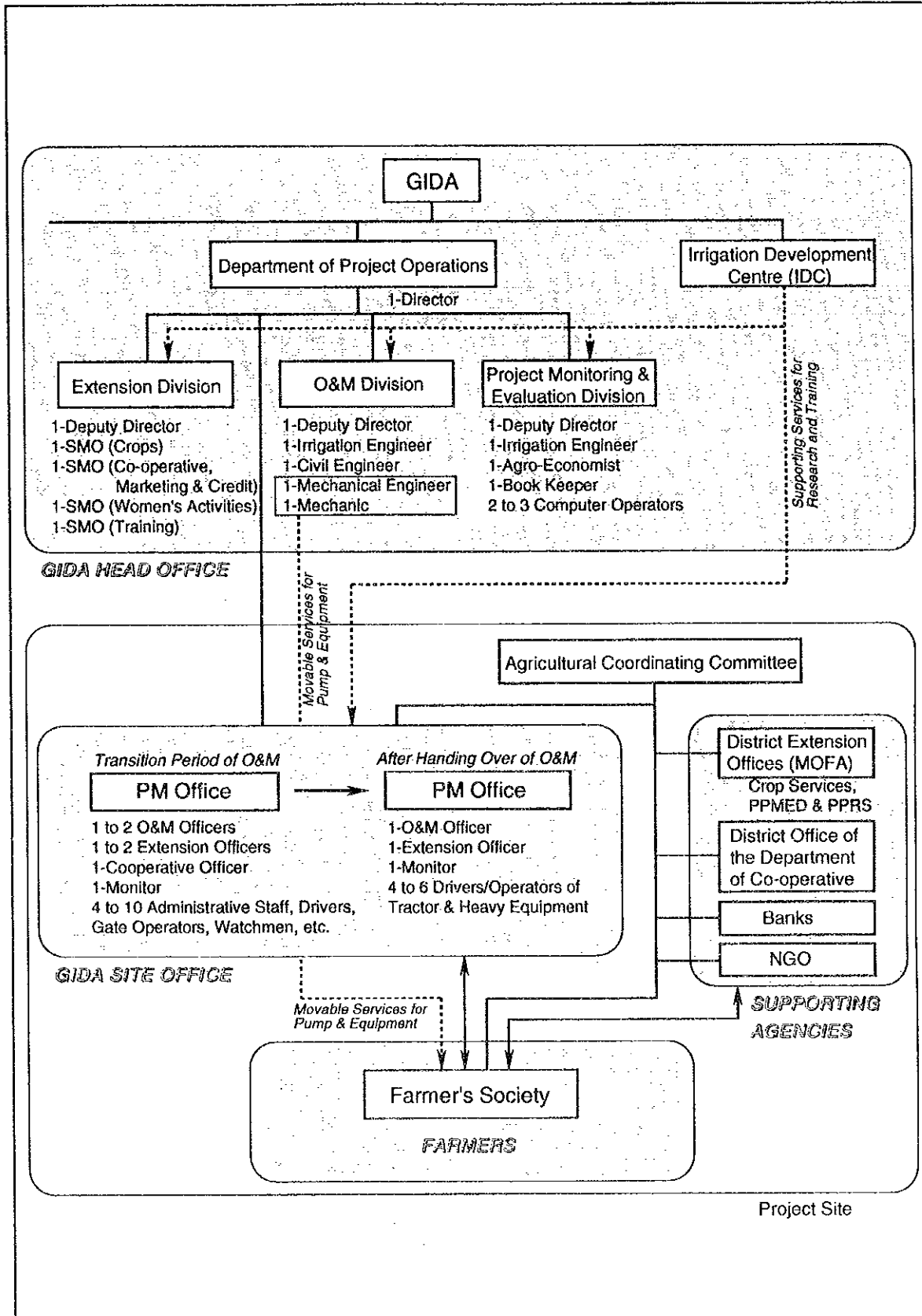




**Figure A-42**  
**Drainage Diagram**  
 (2/2)

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 OF IRRIGATION PROJECTS  
 IN THE REPUBLIC OF GHANA**

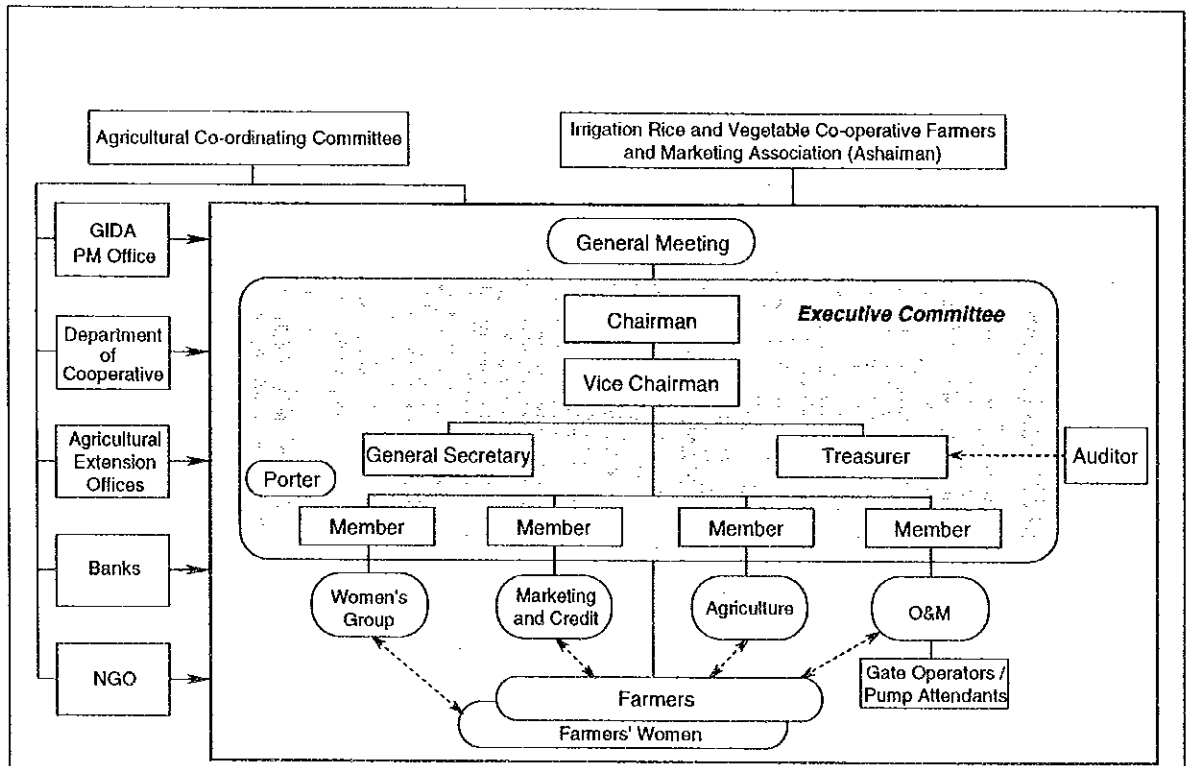
Japan International Cooperation Agency



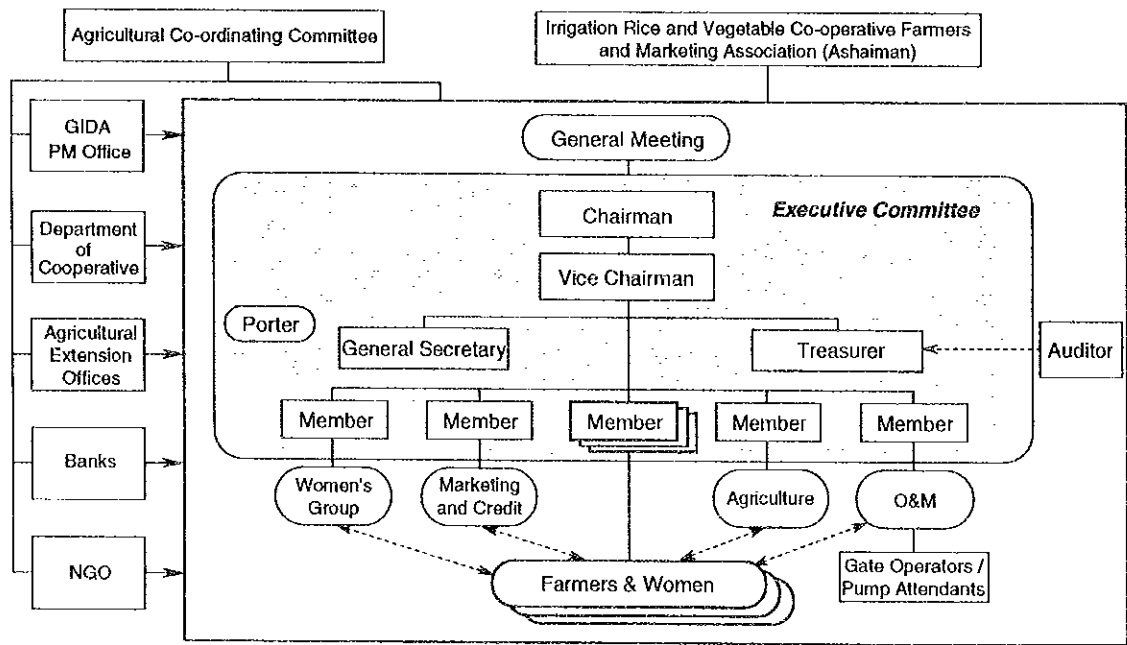
**Figure A-43**  
**Proposed Organisational Structure of Executing Agencies for Handing Over of O&M**

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**Proposed Farmer's Society Type-A**



**Proposed Farmer's Society Type-B**

**Figure A-44**  
**Proposed Organisational Structure of Farmer's Societies**

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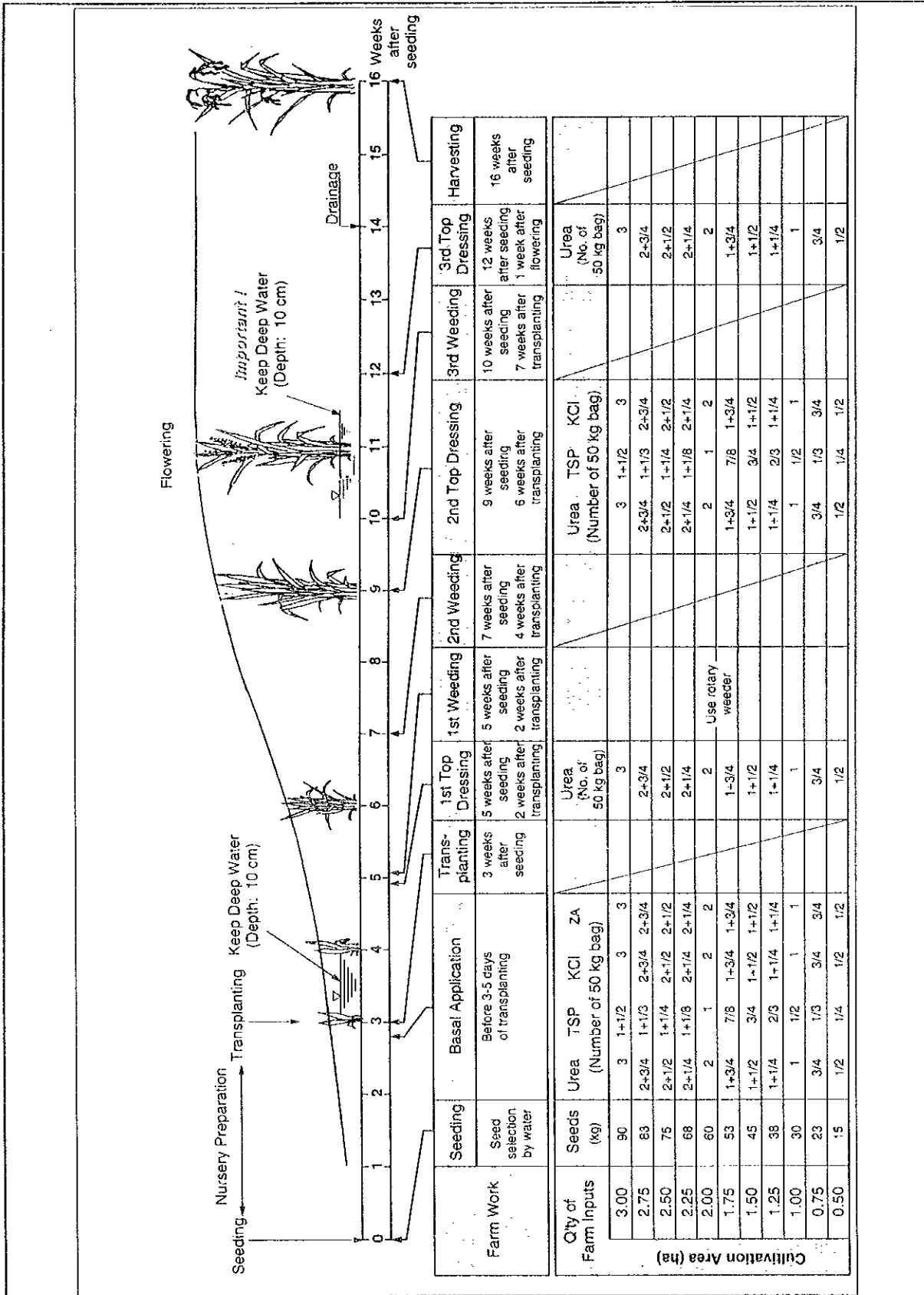


Figure A-45  
Sample of Cropping Calendar  
(Rice Cultivation)

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