University of Asia Pacific

Project

On

"Irrigation Project Management Plan"

For

Village: Payab

Upazila: Muradnagar

Union: Jaharpur Union Parishad (17)

District: Cumilla

Course Name: Irrigation and Flood Control

Course Code: CE 461

Submitted To:

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Section: B

Geographic Location:

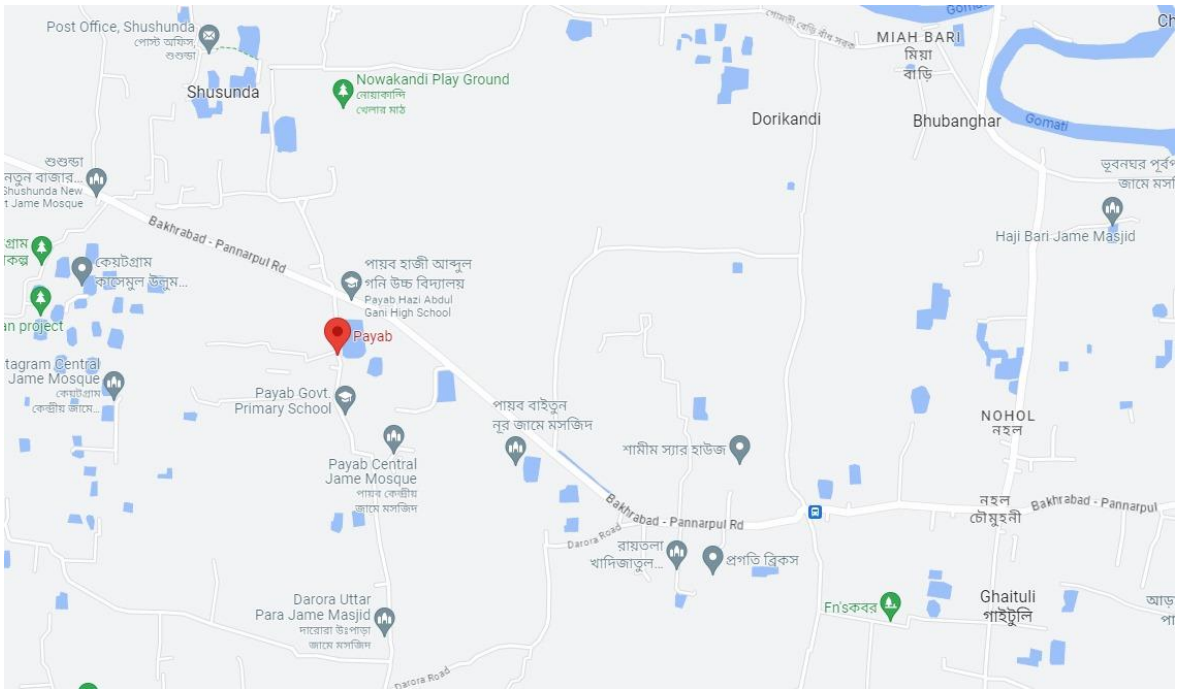

Fig. Location of Payab Village, Muradnagar, Cumilla (23°38'38.8"N 90°55'34.8"E)

Sources of Irrigation Water:

In Muradnagar Upazila in Cumilla district, the source of irrigation water is Gumti River. Gumti river is one of the important water bodies in the region of Cumilla. Gumti river plays an important role in the agriculture sector of Cumilla. In the dry season the farmers rely on the Gumti river for irrigation purpose of their crops. Many canals are connected to the Gumti river and get sufficient water supply. Some other sources of irrigation water in Muradnagar, Cumilla are Titas River, Meghna River, Muhuri River, Little Feni River and Ground Water Sources.

Available Irrigation Water:

There are variations of availability of irrigation water. Availability of water defer depending on many factors in the region. Seasonal variations is one of them. There can be a difference of availability of water in the wet and dry season. In the monsoon season rivers can have lots of water and in the dry season the water availability can be limited. Maintenance of irrigation infrastructure can be a important factor in availability of water. If the irrigation infrastructures are in poor condition, delivering water in the agriculture filed and other sectors can not be done properly. Efficient use of water resources and good management of water can enhance the availably of irrigation water.

Water is required other sectors other than agriculture which needs to consider to meet the various needs of the community. The sectors are Domestic purpose, industrial Water use, Environmental Conservations, Infrastructure and management.

Cropping patterns:

The cropping patterns in Muradnagar, Cumilla-

Period	Crops Name
November- April	Boro Rice, Wheat, Sugarcane, Vegetables,
April- August	Aman Rice, Aus Rice, Jute, Cotton

Crop Neme	Area Cultivated (in hectares)	Crop Period (in days)	Depth of Root Zone (in cm)	Daily Consumptive use of Water (in cm)
Rice	19	130	70	1.25
Jute	10	150	95	1.2
Sugarcane	6	300-545	60-120	1

Irrigation Data:

Field capacity : 30%

Optimum Moisture Content : 15%

Readily Available Moisture : (30-15)%= 15%

Dry Density of Soil, ρd : 1.33g /cm3

Density of Water, ρw : 1 g/cm3

Cultivated Command Area (CCA) : 23 hectare

Calculating the Irrigation Water Requirement for Muradnagar, Cumilla:

For Rice-

Water stored in the root zone = ρd/ρw$* d * R.A.M$

= 1.33/1$*$ 70 $*$ 15%

= 13.97 cm

1.25 cm water is consumed by the crop in 1 day

13.97 cm is consumed by crop the crop in (13.97/1.25) = 11 days

Crop Period = 130 days

Base Period, B = 108 days

Total required water for irrigation, Δ = Consumptive use of water * Base Period

= 1.25*108 cm

= 135 cm

= 1.35 m

Duty, D = 8.64 * B/Δ

= 8.64* 108/1.35

= 691.2 ha/m3/s

Intensity of rice, Irice = $Area\ of\ Crop/C.C.A*$ 100%

= 19/23∗ 100%

= 82.6%

Discharge Required for Rice, Qrice = Arice / Drice

= 18 / 691.2 m3/s

= 0.026 m3/s

For Jute-

Water stored in the root zone = 18.95 cm

Crop Period = 150 days

Base Period = 119 days

Total required water for irrigation, Δ = 1.43 m

Duty, D = 719 ha/m3/s

Intensity of Jute, Ijute = 43.47%

Discharge Required for Jute, Qjute = 0.04 m3/s

For Sugarcane-

Water stored in the root zone = 23.94 cm

Crop Period = 350 days

Base Period = 304 days

Total required water for irrigation, Δ = 3.04 m

Duty, D = 864 ha/m3/s

Intensity of Jute, Isugercane = 26.08%

Discharge Required for Jute, Qsugercane = $6.94*10^{-3}$ m3/s

Total Discharge, Q = Qrice + Qjute + Qsugercane

=0.026 m3/s+0.04 m3/s+$6.94*10^{-3}$ m3/s

0.0729 m3/s

Time Factor (T.F.) = 0.75, Capacity Factor (C.F.) = 0.85

We know, Time Factor (T.F.) = **Actual Discharge/Design Discharge**

Design discharge, Q_{design} = Actual Discharge/Time Factor = 0.0729/0.75

= 0.097 m3/s

Capacity Factor (C.F.) = **Average Discharge/Design Discharg**

Q_{avg} =Capacity factor * Design Discharge = 0.85*0.097 m3/s

= 0.0824 m3/s

Proposed Irrigation Methods:

1. **Furrow Irrigation**- Furrow irrigation for jute, vegetables, cotton. These types of crops are commonly planted in rows which are suitable for furrow irrigation. Only about one-fifth to one-half of the land surface is wetted by water, results in less losses of water by evaporation, run-off, deep percolation. This method doesn't require extensive equipment or infrastructure for this it considered cost effective.
2. **Border Flooding**- Border flooding irrigation for rice, corn. Border flooding is a simple and low-cost method. In border flooding the distribution of water can be uniform to the entire field.

In conclusion, for ensures higher irrigation efficiency and promote conjunctive use of water resources-

- Water efficient crop can be plant more
- Storing rainwater for irrigation
- Improve irrigation scheduling with proper consideration of the factors.
- Aquifer recharge project to store surface water.