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Department of Agricultural Extension (DAE)



Polder Development Plan (PDP) – DRAFT

Polder 25

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List of Abbreviations

BADC	Bangladesh Agricultural Development Corporation
BBS	Bangladesh Bureau of Statistics
BRRRI	Bangladesh Rice Research Institute
BWDB	Bangladesh Water Development Board
CAHW	Community Animal Health Worker
CAWM	Community Agricultural Water Management
CBO	Community-Based Organisation
CDMP	Comprehensive Disaster Management Program
CO	Community Organizer
DAE	Department of Agricultural Extension
DLS	Department of Livestock Services
DOC	Day Old Chicks
DPP	Development Project Proforma
DoC	Department of Cooperatives
DoE	Department of Environment
DoF	Department of Fisheries
DP III	Director of Planning III of BWDB
DPHE	Department of Public Health Engineering
DRR	Disaster Risk Reduction
DTL	Deputy Team Leader
EIA	Environmental Impact Assessment
EKN	Embassy of the Kingdom of the Netherlands
FCD	Flood Control and Drainage
FCDI	Flood Control, Drainage and Irrigation
FFS	Farmers Field School
FGD	Focus Group Discussion
FO	FFS Organiser
FT	Farmer Trainers
GAP	Gender Action Plan
GIFT	Genetically Improved Farm Tilapia GIFT
GoB	Government of Bangladesh
GoN	Government of Netherlands
GPWM	Guidelines for Participatory Water Management
Ha	Hectare
HH	Household
HYV	High Yielding Variety
IGA	Income Generating Activity
IAPP	Integrated Agriculture Productivity Project
IPM	Integrated Pest Management
IPs	Input Providers
IPSWAM	Integrated Planning for Sustainable Water Management

IPSWARM	Integrated Planning for Sustainable Water Resources Management
IRRI	International Rice Research Institute
KII	Key Informant Interview
LCS	Landless/Labour Contracting Societies
LGED	Local Government Engineering Department
LGI	Local Government Institutions
M&E	Monitoring and Evaluation
MFI	Microfinance Institutions
MFS	Market Oriented Farmers Field School
NGO	Non-Governmental Organisation
O&M	Operation and Maintenance
PCD	Program Coordinating Director at BWDB
PD	Program Director at DAE
PDP	Polder Development Plan
PSF	Pond Sand Filter
PTO	Power Tiller Operator
PWMR 2014	Participatory Water Management Rules 2014
RF	Resources Farmers
SAAO	Sub-Assistant Agricultural Officer
SaFaL	Sustainable Agriculture, Food Security and Linkages
SMART	Specific Measurable Attainable Relevant Time Bound
SRDI	Soil Resources Development Institute
SWOT	Strengths, Weaknesses, Opportunities, and Threats
TA	Technical Assistance Team of Blue Gold Program
TL	Team Leader
TOT	Training of Trainers
UP	Union Parishad
VC	Value Chain
VCA	Value Chain Analysis
VCD	Value Chain Development
VCS	Value Chain Selection
WASH	Water Sanitation and Hygiene education
WMA	Water Management Association
WAP	Water Management Group Action Plan
WMF	Water Management Federation
WMG	Water Management Group
WMO	Water Management Organisation
XEN	Executive Engineer
ZSE	Zonal Socio Economist

Glossary

Arotdar	Service provider to Bepari and Pikers in wholesale markets. Facilitates the buy/sell process. May provide purchase negotiation assistance, storage space, selling space, short term and seasonal credit, and arrange truck transport of goods purchased by Bepari to markets.
Beel	Naturally depressed land inundated under water for at least one season
Bepari	Key wholesaler in the supply chain. Moves goods between markets buying in source markets and selling in destination markets. Exerts the main influence on price earned by farmers.
BKash	BKash Limited is a joint venture between BRAC Bank Limited, Bangladesh, and Money in Motion LLC, USA. Less than 15% of Bangladeshis are connected to the formal banking system whereas over 68% have mobile phones. BKash utilize these mobile devices and the omnipresent telecom networks to extend financial services to the under-served remote population of Bangladesh.
Business service	Service that is sustainable through private sector transactions and that improves the performance of the value chain, its access to markets, and its ability to compete.
Capture Fisheries	Capture fisheries refer to open water fisheries resources in both marine and freshwater environments. Capture fisheries is exploitation of aquatic organisms without stocking the seed. Recruitment of the species occurs naturally. This is carried out in the sea, rivers, reservoirs, khal, beel, floodplain etc.
Climate Change	Climate change refers to any change in climate (average weather) over time, whether due to natural variability or as a result of human activity. Average weather includes temperatures, wind patterns and precipitation.
Cross-cutting issues	Issues that affect all areas of concern within their context.
Culture Fisheries	Culture fisheries are the cultivation of selected fishes in confined areas with utmost care to get maximum yield. The seed is stocked, nursed and reared in confined waters, and then the crop is harvested. Culture takes place in ponds, ditches, rice fields which are fertilized and supplementary feeds are provided to fish to get maximum yield.
Disaster Risk Reduction (DRR)	DRR is a conceptual framework intended to systematically avoid (prevent) and limit (prepare/mitigate) disaster risks with regard to losses in lives and the social, economic and environmental assets of communities and countries.
Embankment	An embankment is a high earthen dike surrounding an area in order to protect it from external floods and salinity.
Enabling environment	Environment favourable to working, participating and demonstrating potentials.

Farmers Field School (FFS)	FFS is a participatory group based learning approach where farmers can learn by doing and share their experiences.
Governance	Description of the dynamic distribution of power, learning, and benefits among participants in a value chain.
Inlet	Inlets are small structures across the embankment to take in fresh water for irrigating high lands along the periphery of the polder. Outlets are small structures across an embankment to drain out local pockets in the polder.
Landless/Labour Contracting Societies	It is an approach to engage local poor people/labourers as a group for construction of rural infrastructures. The group is treated by the development authorities/project as a contractor for the work allocated.
Local Governmental Institutions (LGIs)	The institutions formulated under different Acts/Ordinances to run the different administrative unites of Local Government system by the Government.
Kharif-I	Pre-monsoon season, from March to half July.
Kharif-II	Monsoon and post-monsoon season, from July to October.
Khal	Excavated or natural routes across any land area for draining out excess water and flushing in required water.
Market Actor	Smallholder, input supplier and output market players directly participating the value chain.
Market development based	Activities that try to make the interaction between demand and supply more effective.
Market transaction	The exchange between demand and supply is at full market price (the price at which suppliers are prepared to sell and consumers are prepared to buy, in an unsubsidized situation).
Market	A set of arrangements by which buyers and sellers are in contact to exchange goods or services—the interaction of demand and supply.
Needs Assessment	It is an assessment of the needs and priorities of local population in a polder.
Piker	Buys directly from various farmers to ensure a bulk. Bulk is sold to Arotder or to destination market. Exerts the main influence on price earned by farmers.
Polder	A polder is an area protected by embankment all around, having necessary structures across the embankment to drain out excess rain water and flush in required fresh water for irrigation.
Rabi	Dry season, from November to March.
Standing Committees of UP	Standing Committee means the Standing Committee formulated under the Local Government (Union Parishad) Act, 2009.

Sluice	A sluice is a structure constructed across an embankment to drain out excess water from a polder and / or flush in required water in to the polder.
Union Parishad (UP)	Union Parishad means the Union Parishad formulated under section 10 of the Local Government (Union Parishad) Act, 2009.” It is the lowest tire of the Local Government system in Bangladesh.
Value Chain	A ‘value chain’ can be defined as all the actors who buy and sell from each other in order to supply a particular set of products or services to final consumers.
Water Management Group Action Plan (WAP)	It is the plan and strategy of the WMG, to address issues and problems of their area at a given time as well as to implement their actions as part of the polder development planning.
Ward	Ward means the Ward of Union Parishad. Each Union Parishad consists of 9 Wards.
Water Management Organisations (WMO)	It is a common name for all organizations formed for the purpose of water management in a polder, namely WMG, WMA and WMF.
Water Management Group (WMG)	Local people organized within a hydrological unit or at village level to manage water resources are collectively called Water Management Group.
Water Management Association (WMA)	It is a higher tier of water management organization formed by representatives of WMGs.
Water Management Committee (WMC)	It is a committee to initiate and coordinate operation and maintenance activities in a catchment area. It is formed by representatives of WMGs.
Water Management Federation (WMF)	This is the highest tier of water management organization in the polder. It is formed by representatives of all WMAs.
Zonal level	Blue Gold has three field offices in Patuakhali, Khulna and Satkhira to coordinate and manage the project interventions; these are sometimes called zonal offices.

1. Introduction

1.1 Blue Gold Program Context

The overall objective of the Blue Gold Program is to reduce poverty in the coastal area by enhancing the livelihood of the rural population, through more efficient water resources management and increase productivity of mainly crops, fishery and livestock in the polders and by empowering the communities to be the driving force.

The specific objectives of the Program are to:

- Increase sustainability of the development of the polders through effective community participation. The community organizations will become the driving force for the natural resources based development, whereby environment, gender and good governance are effectively addressed in their operations;
- Protect floods and use water resources effectively;
- Increase farmers' income and strength livelihood through improved productivity (for each polder a Business Plan will be developed with the value chain analysis); and
- Improve environment, drinking water and sanitation. The living environment will be realised and sexual reproductive health rights (SRHR), balanced nutrition, and good governance issues are well understood and applied.

1.2 Definition and Objective of a Polder Development Plan

Definition of a Polder Development Plan

A Polder Development Plan (PDP) contains an integrated analysis and planning for developing a polder in relation to community mobilization, water management, agriculture, business development, environment, gender, and institutions¹.

Objectives of a Polder Development Plan

1. The provision of an internal discussion document for the Blue Gold TA team and the implementing agencies (BWDB and DAE) to plan, design and implement at polder level in an integrated manner;
2. A clear outline for WMOs what type of activities Blue Gold is providing, which helps them to develop their own WMG Action Plans (WAP);
3. A starting point for BWDB to prepare detailed rehabilitation plans and for DAE to fine-tune the FFS modules and stimulate business activities as well as a strategy to strengthen institutions like Union Parishad (UP); and
4. Linkages with Blue Gold's logical frameworks and M&E activities, to ensure that the proposed interventions at polder level are contributing to the overall program objectives and can be justified towards stakeholders and donors.

¹ An important consideration is that a polder is a multi-dimensional geographical unit delineated by water in which various and continuously changing development processes take place. Polder boundaries do not always coincide with administrative boundaries. The PDPs developed by the Blue Gold Program therefore do not capture the full picture. They zoom in on specific water and production related features of polders and try to make a dynamic analysis of the water management organisations operating in that sphere, their resources, their activities and their needs. Other Local Government Institutions (LGIs), NGOs and donors are operating in the same polders and they have their own sphere of interest, scope, analysis, plans and programs within or even beyond the physical boundaries of these polders. A Blue Gold PDP is thus not a substitute or umbrella plan for all types of activities and programs taking place in the polder.

2. Present Situation and its Challenges

2.1 Physical Features and Demography

Polder 25 is managed by the Bangladesh Water Development Board (BWDB) and was constructed during 1963-67 and later on was rehabilitated under the KJDRP project from in early 1996 to 31 December 2002. Polder 25 is located at Khornia, Rudaghora, Rughunathpur, Dhamalia and Rangpur unions in Dumuria upazila; Damodor, Jamira and Atra Gilatola (P) union in Fultola upazila; and Arongghata (P) and Jogipol (P) union in Digholia upazila under Khulna district. It is surrounded by Hamkura (dead) and Bhadra (dead) river in its South, Bhairab river at the East, Hori river in the West and Jessore-Khulna high way road in its Northern part. The characteristics of the polder can be found in Table 1 and the location map of the polder with respect to Upazilla and Union headquarters is shown in Figure 1.

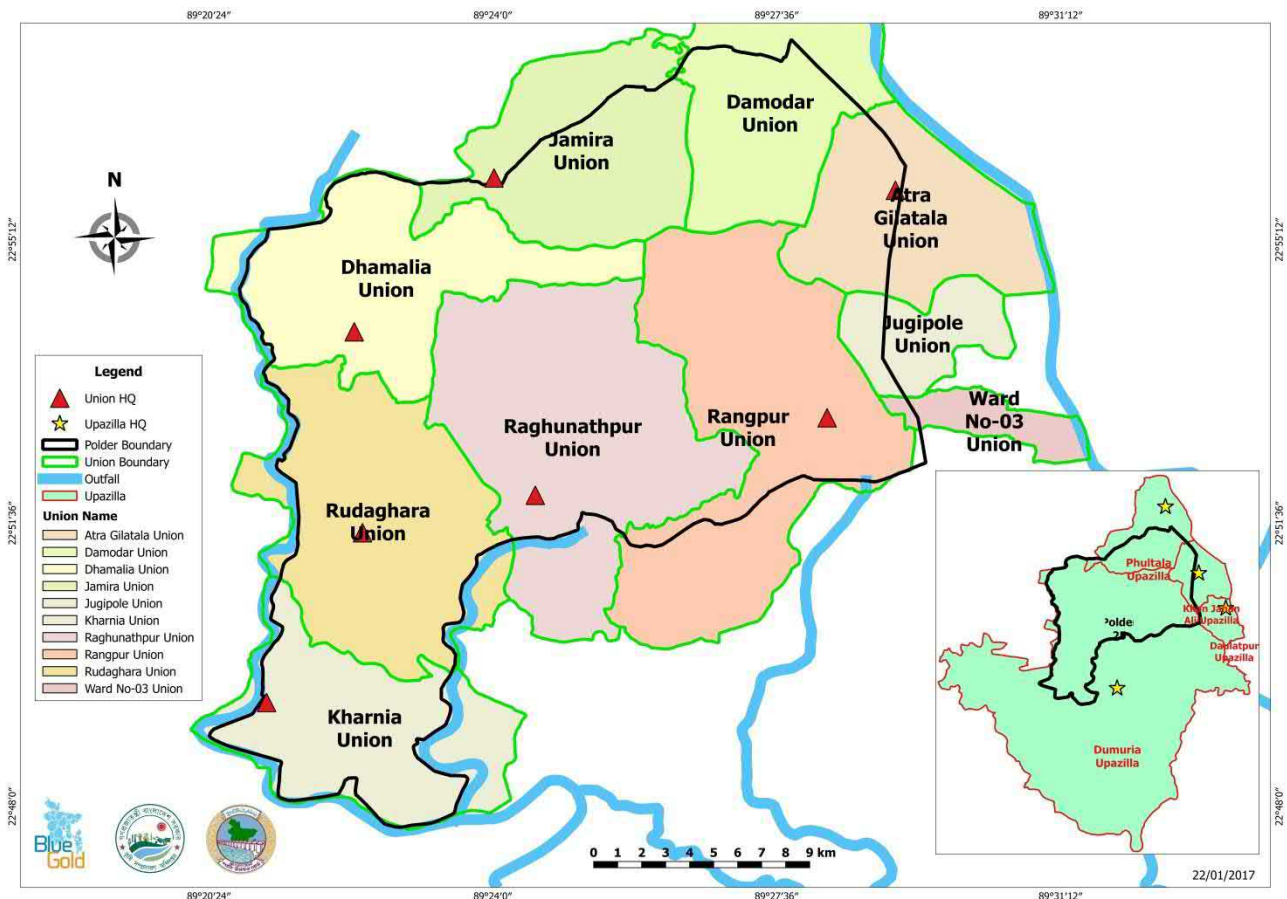


Figure 1: Location of Polder 25 in Dumuria, Fultola and Digholia Upazila under Khulna District (map to be replaced)

Table 1: Main Physical and Demographic Characteristics of polder 25

Characteristics			
Included Upazila(s)	Dumuria, Phultola and Digholia		
Included Unions	Kharnia, Rudaghora, Rangpur, Raghunathpur, Dhamalia, Jamira, Damodar, Atra Gilatola, Jogipole and Aronghata		
Polder boundary (in km)	61 km		
Total number of Mouzas	55		
Total polder area (in ha)	17400		
Total number of households in the polder	44,483		
Total number of catchments	10		
Total cultivable land (in ha)	14379	High land: 27% Medium-high land: 47%	Low land: 26%
Population	224,953, Male-109,490, Female-115,463		
Literacy rate	81%	Male: 55%	Female: 45%
Major occupations	Agriculture (45%)	Agricultural labour (27%)	Business (13%) and Others (15%)
Economic condition	Rich: 13%	Middle class: 54%	Poor: 33%
Status of seasonal labour migration	After harvesting T-Aman during mid of January to March is lean period for agricultural labor as at the time there are no agricultural activities. During the period farmers usually migrate to other nearest places. Approximately 8-10% farmers go to nearest Dumuria, Jessore and Khulna city. They engage to sell labor in brick field, jute mill, rickshaw-pulling and some are engage small business by door to door selling.		
Status of internal road communication	The Khulna-Satkhira highway pass through part of the southern part of the polder (Kharnia Union) and Khulna by-pass road forms part of the eastern boarder of the polder. There are about 172 kms of metalled road, 189 kms brick soling road and 179 km of earthen road. The local inhabitants are using van, rickshaw and easybike as major transport. Internal road communications facilities are connected with embankment road.		

2.2 Water Resource Management and Infrastructure

In the main characteristics of the water resource management and infrastructure of polder 25 are highlighted at Table 2 and Figure 2 shows the locations of existing infrastructure and khals in polder 25. Further details can be found in Appendix 2.

Table 2: Main features of Water Resource Management and Infrastructures of Polder 25

Features			
Length of embankment (in km)	46 km		
No of drainage/flushing sluices	17 (11 active and 6 inactive)	Good conditioned: 0	Poor conditioned: 11
No of inlets	00	Good conditioned: N/A	Poor conditioned: N/A
No of (drainage) outlets	00	Good conditioned: N/A	Poor conditioned: N/A
No of khals	114 (main khals are 45, and secondary and tertiary khals are 69)		
Length of khals (in km)	About 299 km (main, secondary and tertiary)		
Main outfall rivers, major drainage khals and sluices	Main out fall rivers: Hari River on the west and southwest, Hamkura River on the southeast (part, dead), Bhadra River on the south (part,		

	<p>dead) and Upper Sholmari on the east (part).</p> <p>Major Drainage Khals: Khornia Khal, Chahera Khal, Gonali Khal, Salua Khal, Amvita Khal, Thukra Khal, Beel Salatia Khal, Dahakhola Khal, Kewratola Khal, Shoilgati Khal, Katenga Khal, Chanfer Khal, Shantola Khal, Maruar Khal, Ashifoot Khal, Kata Khal, Beel Taowalia Khal, Jora Bottola Khal, Putimara Khal, Burir Khal, Rishibari Khal, Mondal Bari Khal, Baruna Bazar Khal, Jelepura Khal, Hamkura Khal, Tipna Khal, Banshtola Khal, Dakatia Khal, Aror Khal, Mojumder Khal, Hawlader Ghatar Khal, Rajapur Khal, Boraitola Khal, Tetultola Khal, Dhopa Khal, Adir Khal, Thikader Burir Khal, Chapa Sundor Khal, Trimohoni Khal, Neemtola Khal, Horhoria Khal, Rup Rampur Khal, Modhugram Khal, and Singra Khal etc</p> <p>Sluices (active): Chahera Sluice, Shoilgati Sluice, Keoratola Sluice - 1, Keoratola Sluice-2, Dahakhola Sluice, Beel Salatia Sluice, Solua Sluice, Amvita Sluice, Thukra Sluice, Modhugram Sluice, Khornia Sluice.</p> <p>Sluices (inactive): Katenga Sluice, Mikshi Mill Sluice, Chailor Sluice, Balikhali Sluice, Pasura Sluice, Pachpotapota Sluice.</p>
Situation of tidal and river flooding	There is no tidal and river flooding in this polder.
Locations with water logging and siltation.	Beel Dakatia, Baruna beel, Dohakhola beel, beel Tawalia, beel Salatia, Gonali beel, Beeldar beel and Modhugram beel are very much prone to water logging. The duration of water logging is around 3-6 months (July to December).
Most river erosion prone area	Most river erosion prone area is Khornia Bridge to Bhadrada Mosque reach and Khornia Bazar to Mery Bricks reach, total 1.5 km.
Other relevant water issues	Hamkura and Bhadra Rivers are totally silted. Many parts of Bhadra River are occupied for paddy cultivation and fish cultures (gher). Upper Sholmari river is partially silted up. The sluice downstream of the Upper Sholmari River is controlled by influentials because of which water flow from Beel Dakatia and Thukra areas coming down through Modhugram, Thukra, Amvita and Solua Sluices cannot pass easily. It can be solved only if the sluice operated jointly by all polder WMAs or by a WMF. Some main khals are blocked by cross dams which also cause internal drainage problems.
Key challenges in effective water management	Siltation of outfall rivers, control of Sholmari Sluice by influential, fishing nets and fences in drainage channels, congestion due to water hyacinth, leasing of khals, changing river morphology, cross dams across canals, non-functioning sluice gates, cultivation of seed beds along the drainage channel etc.
Challenges in planning construction/rehabilitation of water management infrastructures in the polder.	Local demand especially for drainage canals were much more than the available provision, difference of opinion during prioritization of the interventions and domination of the local influentials etc.
Current internal polder water management practices	Currently there are no systematic water management practices. Usually, the polder inhabitants used to go to chairman while required and the chairman takes decision regarding operation of the infrastructures.
Overall condition of internal polder water management	Water management is not satisfactory because existing WMOs are not functional or active.
Opportunities for internal polder water management	When all the water management infrastructures in polder 25 are rehabilitated, blockages are removed and outfall sluices are jointly operated, internal water management problems will be reduced and agricultural production as well as other opportunities will increase.

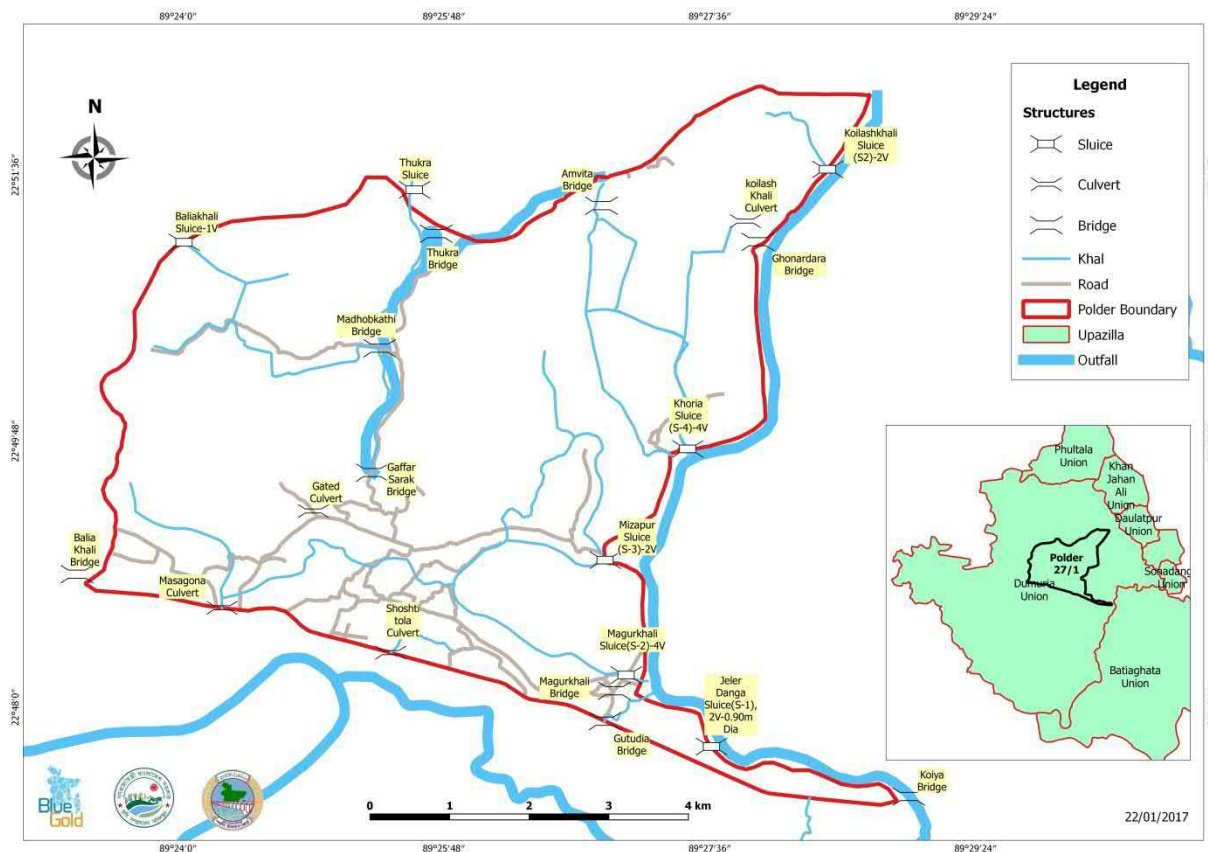


Figure 2: Map of Polder 25 showing the existing Khals and Water Management Infrastructure (map to be replaced)

2.3 Institutional Framework for Participatory Water Management

The main institutional actors in polder 25 are Union Parishad (UP), its Wards, various Local Governmental Line Departments, a number of NGOs, Micro-finance Institutions, Market Committees, Water Management Groups (WMGs), Water Management Associations (WMAs) and Union Disaster Management Committees (UDMCs). Main characteristics of the WMGs and WMAs and other institutional actors are highlighted in the Table 3. The boundaries and names of the WMGs and WMAs are shown in Figure 3.

Table 3: Main characteristics of the Institutional Framework of PWM in Polder 25

Characteristic			
Number of WMGs	65	Registered: 12	Non-registered: 53
Members of WMGs	2275	Female: 455	Male: 1820
HHs being part of WMGs	2100		
Number of WMAs	02	Registered: 00	Non-registered: 02
Female representation in WMGs	25%		
Total deposited fund (BDT)	90,000		
Total savings of WMGs (BDT)	90,000		
Total number of WMGs with O&M fund	Not any fund		
Names of projects and organisations with similar /	SaFaL which is similar with Blue Gold Program has been working in polder 25 since 2014 and it will continue up to March, 2017. There are		

related activities	many NGOs are working in the polder! but not similar with Blue Gold Program such as; Uttaran, IDE-SenMark, CSS, Asha, TMSS, DSK, Jagorono Chakra Foundation, Grameen Bank etc.
Existing WMOs linkages with other stakeholders	Officially no linkage with UPs, however linkages with other service providers like DAE, BWDB, LGED, NGOs and private sector actors should still be further strengthened.
Number of WMGs member including in UP standing committee	As a WMG member no one included in UP standing committee
O&M agreement signed with BWDB	Not Applicable
Current participation of WMOs in O&M	Informally participated but not found any documents.
Existing conflicts on water management	There is a small conflict between gher owner and agriculture farmers on cross dam.
Key challenges in strengthening PWM	<ol style="list-style-type: none"> 1. Coordination with Gutudia UP chairman for ensuring drainage of water through Sholmari regulator 2. Internal conflict with gher owners and other farmers; 3. Removal of cross dam and cleaning water hyacinth 4. Leaseing khas lands; and 5. Re-formation of KJDRP WMG.
Key challenges in relation to women participation	Community of Damodar and Jamira union are very much conservative but other areas are very positive.
Key opportunities in PWM	<ol style="list-style-type: none"> 1. NATP-CIG group and Group of SaFal program are existing and functioning which could be a platform for Blue Gold Program; and 2. Women farmers are very active and interested to work with WMOs

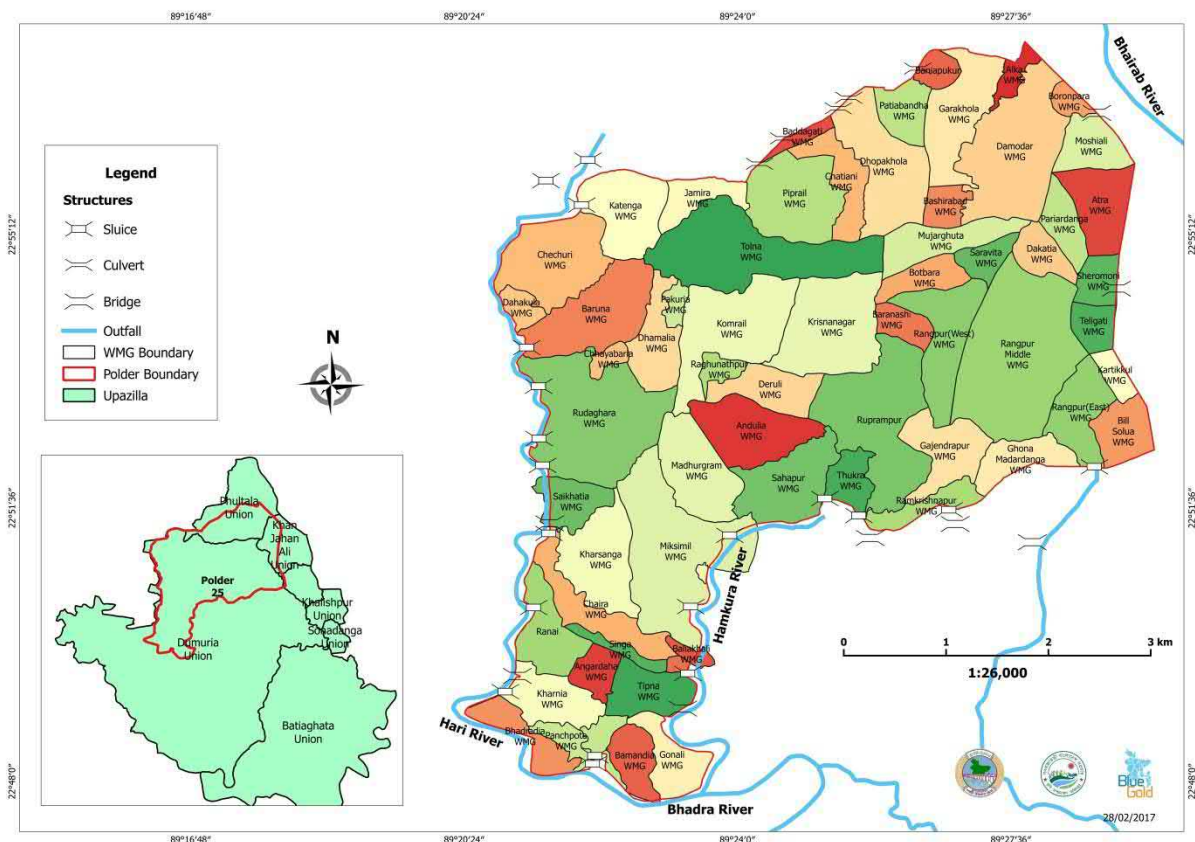


Figure 3: Name of WMG and WMA areas in Polder 25 (map to be replaced)

2.4 Agricultural and Marketing Services

In polder 25, most of the polder dwellers are involved in crop production and fish culture. Livestock keeping is to a certain extent important. The most important characteristics and challenges of agricultural production and marketing services can be found in Table 4. The main markets of polder 25 are shown in Figure 4.

Table 4: Main characteristics of Agricultural and Marketing Services in Polder 25

Characteristic			
Main crops (top three)	Rice	Prawn/carp culture	Vegetable
Current most common cropping pattern	Fallow-Fallow-T aman (10%) Boro-Fallow-T-Aman/Fisheries (60%) Boro-Fish-Fish (16%) Robi Veg-Fallow-T-Aman (5%) Spices-Vegetable- Vegetable (5%) Vegetable- Vegetable- Vegetable (4%)		
Current cropping intensity	207%		
Main vegetables	Winter: Cucumber, Brinjal, Ridge Gourd, White Gourd, Bitter Gourd, Bottle gourd, Okra, Kohlrabi, Country Bean, Red Amaranthus, cabbage, Sweet Gourd, String Bean, Cauliflower, Tomato, Spinach etc. Summer: Indian Spinach, Dram stick, Amaranthus etc. mainly in the homestead		
Main fruits	Guava, Mango, Coconut, Jackfruit, Betel nut, Lemon, Banana, Jujube and Papaya.		
Available agricultural machinery	Agriculture machineries (power tiller, irrigation pump, low lift pump) are available in polder area. All most all large farmers have own machineries. During boro rice season tillage period are long, so medium and small farmers can hire machineries as available for tillage and also irrigation. Around 25 workshops are available in the polder area where light maintenance services are possible.		
Present irrigation practices	In polder 25 approximately 60% lands come under the irrigation facilities especially for boro rice and vegetable. Mainly surface water (reserve tank cannel, gher and pond water) is used for irrigation. Agricultural equipment is used for proper management of irrigation.		
Availability of inputs	Seed, fertilizer, pesticide, farm machineries, irrigation & tillage facilities is the main input of agriculture sector. In Polder 25 only 7 fertilizer dealers are available and 12 seed dealer and 31 retailers are present in polder. Mobile seed sellers also have been provided input service from the local markets. Around 41 vegetables sapling seller also sells saplings in local market. In some cases farmers also go to the nearest places like Chucknagar, Dumuria, Doulotpur, Khulna to buy quality inputs. In polder 25, rice is the main field crop and in this farming system farmers mainly use high yielding variety and also large farmers use hybrid rice seeds. Many farmers now use gher dyke for commercially vegetable cultivation and they are depending on company's marketable improved and hybrid variety vegetable seeds which are available in local hats retailer shops. Some farmers also purchase seeds from Chuknagar, Dumuria and Khulna.		
Current knowledge on proper input use	Some of the farmers have lack of knowledge to identifying quality seed especially on rice seed. In rice production system, farmers don't follow the		

	<p>actual dozes of fertilizers. Beside farmer always use higher number of seedlings (4 to 5plants) for Boro rice production. Some farmers also use broadcasting technique for rice cultivation. Till now some farmers are not aware of hybrid rice seed.</p> <p>For Shrimp farming farmers don't have adequate knowledge on semi intensive practices.</p>
Important business trend in crop production	Boro, Vegetables, Jute, Mustard, Sesame are main cash crop inside the polder area. Farmers sell their rice at nearest markets and sometimes at farm gate. Farmers purchase quality seeds of rice and vegetables from polder markets and sometimes from Chuknagar, Dumuria and Khulna.
Key challenges in agriculture	<ol style="list-style-type: none"> 1. In Kharip season farmers cultivate prawn/shrimp culture. Through cultivating shrimp the quality of land gradually damaged. So there is a very less opportunity for other crops cultivation other than boro rice; and 2. The job opportunity for agriculture labors is gradually decreasing as soil salinity is gradually increasing due to shrimp cultivation.
Percentage of households owning livestock	Cattle 36.6%; Goat – 20.5%; Poultry – 64.6%; Duck-51.9; & Goose-3.4% [Source: MAPPING EXERCISE ON WATER-LOGGING IN SOUTH WEST OF BANGLADESH by FAO]
Availability of inputs for livestock	The farmers of the polder 25 rear cow for milk and poultry for meat. Poultry feed and DoC seller`s are present in polder markets. Around 12 vaccinators provide necessary services. Due to unplanned shrimp farming enough fodder for livestock are not available all the polder area.
Important business trend in livestock	Milk- Collectors (Goala) are the prime buyers of milk from the milk producing households. 2 milk chilling centres purchase milk directly and collectively from milk producers. There are some local buyers/business men who buy local poultry egg and cattle from the farmers. They visit home to home and purchase directly from the farmers house. The demand of local breed of poultry increasing as well as its price is increasing.
Key challenges in livestock	<ol style="list-style-type: none"> 1. Fodder cultivation practices are very poor; 2. Around half of the year cattle depend on dry straw; 3. Poor housing and management of livestock; and 4. Less opportunity for adaptation of improves variety.
Percentage of households involved in fish culture	20 – 40 % of the households have culture ponds but about 90% households are involved with rice-fish culture
Types of fish	Golda shrimp is main fish in polder 25. There are also other several species of fish are cultivating in the polder, i.e. rui, katla, mregel, thai puti, grass carp, silver carp, prawns etc.
Availability of inputs	<p>PL for shrimp and prawn collect from the dealers of Dumuria, Chuknagar, Solgatia, Jamaria and Phultola, the dealers also collect from Coxbazar/ Chitagang.</p> <p>The carp farmers purchase fingerlings from Chuknagar, Dumuria and sometimes Jessore. They also purchase fingerlings and PL from fry hawkers.</p> <p>Fry hawkers collect fingerlings from Jessore area and sell fingerlings in the polder areas. There is no nursery or hatchery in the area. Fish feed is not available in the local market. Fish medicines are not available in the polder areas. Farmers buy medicine and feed from Shahpur.</p>
Important business trend in fisheries	The traditional shrimp and prawn supply chain in polder 25 is characterised by a large number of middlemen (Faria, Aratdar, Depots, Paiker and

	<p>Accountholders). These middlemen provide financial or other services (e.g. collecting, auctioning or transportation) and consolidate raw material along the supply chain. The marketing channel that a farmer uses depends mainly on the harvest volume, the location of the farm, the financial ties of the farmer, and the offered terms of payment. The exact configuration of the supply chain varies widely from location to location and from farmer to farmer. The major stakeholders are Faria, Aratdar, Depots, Paiker and Accountholders.</p>
Key challenges in fisheries	<ul style="list-style-type: none"> • Pushing and soaking in shrimp; • Price manipulation; • Quality and food safety; • Traceability; • Disease problem; • Quality fingerlings & PL are not always available; • Low fish production per hectare; • Low quality feed; and • Extension facilities are less.
Existing extension services	<p>There is no extension worker from the Department of Fisheries in the polder area.</p>
Name and location of markets	<p>In polder 25 there are 26 markets. The major markets are Bane Pukur hat, Rudaghora; Hadramtola hat, Rudaghora; Baliakhali bazar, Khornia; Khornia bazar, Khornia; Chanchuri bazar, Dhamalia; Aruabadhal bazar, Dhamalia; Dhamalia bazar, Dhamalia; Rudagora bazar, Rudagora; Hasanpur bazar, Rudagora; Chara hat, Rudagora; Sholgotia bazar, Rudagora; Hamkura hat, Rudagora; Miksimil bazar, Rudagora; Thukra bazar, Ragunathpur; Ragunathpur bazar, Ragunathpur; Shahapur bazar, Ragunathpur; Baruna bazar, Dhamalia; Kumrail hat, Ragunathpur; Solua bazar, Rangpur; Modhukgram Duk Bangla bazar, Rudagora; Rangpur Katakhal hat, Rangpur; Amvita bazar, Rangpur; Jamira bazar, Jamira; Digar hat, Jamira; Bener Pukur hat, Damudar; Afil Mill Gate bazar and Atra-GilaTola bazar</p>
Products provided	<p>In polder 25 there are many products – Boro Rice, Shrimp, Prawn, Carp, Vegetables, Milk etc. are main marketable products.</p>
Surplus destination of products outside polder	<p>Boro rice, shrimp, prawn, carp, vegetables milk egg are the main agricultural products of polder 25 and after family consumption; farmers sold the surplus rice through different markets and this product directly goes to dumuria arot or Khulna or outside the polder area. Shrimp is another largest crop and farmers produced it as cash crop so that 30% products sold through local depots, 40 % Dumiria upazila level arot and 30 % Rupsa wholesale markets. Milk is also sold in local chilling centres and through chilling centre milk goes to regional markets and also national markets. Vegetables also sold in local markets, Dumuria arot and Khulna whole sell market.</p>
Main value chain actors	<p>Boro rice, shrimp, prawn, carp, vegetables milk are the selected value chain products for polder dweller. Approximately 60 depot, 35 input traders (seed pesticide and agri machineries), 55 fish feed and medicine seller, 15 service providers (poultry and Livestock vaccinator), 130 local piker, and egg collectors efficiently work as value chain actors for strengthening the value chain activities. Among the actors someone play the supporting role and someone functioning as the main actor. Beside union parishad, union level government office like; DAE & DLS have been providing roles & regulation related enabling support services.</p>
Key challenges in marketing	<ol style="list-style-type: none"> 1. Very difficult transportation facilities due to isolated road communication and as a result big buyers can not easily go to inside the polder for buying bulk amount of product; 2. Farmers' always pay high transportation cost for selling their products through polder markets to dumuria whole sell market. Because of in polder

markets less opportunity for getting high price and price fluctuations always demotivate farmers; and

- Lack of knowledge on improved production technology (soil tolerant variety, seed rate, fertilizer use) and postharvest technologies (timely harvest, drying, grading, packaging etc).

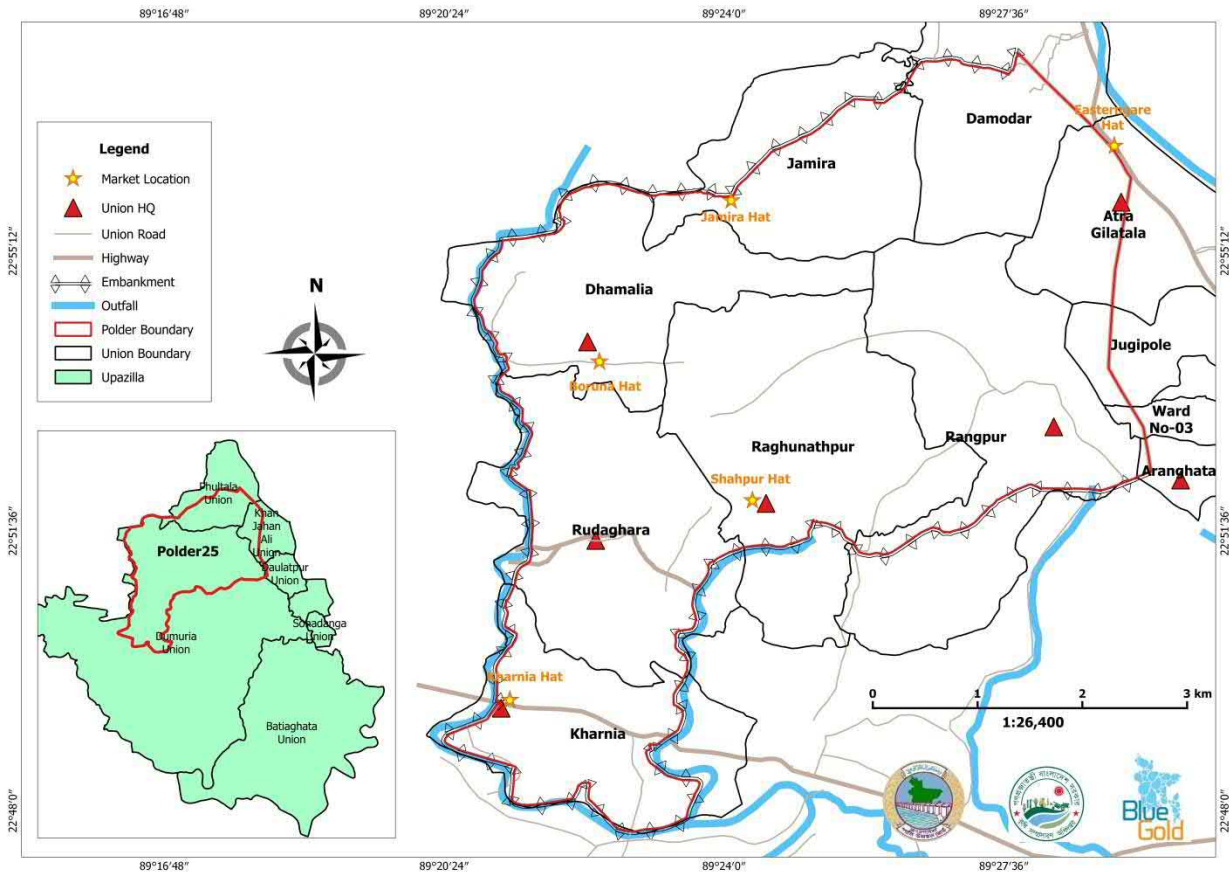


Figure 4: Markets and Union headquarters in Polder 25 (map to be replaced)

2.5 Environmental Sustainability and Disaster Risk Reduction

Table 5: Main environmental and DRR characteristics of polder 25

Characteristics	
Existing environmental problems	<ol style="list-style-type: none"> As reported by the UP members and WMA leaders there is erosion zone which is Khornia bridge to Bhadradia mosque point and Mery bricks point to Khornia bazar, total 1.5 km. And overtopping areas are including Chahera sluice point, beel Salatia at Dohokhola village point, Ahad Ali Golder gher point and Shoilgatia bazar point; Few influential has taken lease the flowing river/khals for culture fish, they establish fench/bamboo made patha which cause siltation and accelerate drainage congestion; Singa khal, Dohokhola khal and Salatia khal are occupied by the fish farmer for fish culture which causes drainage congestion; Chanfer khal, Singar beel, Modhugram beel and Chahera sluice point are

	<p>exposed to severe water logging during July to December. The Ashifut khal, Shoilmari gate point, Sholua gate area, Aambhita Thiar khal, Thakurjir khal, Mondol bari khal, Tirmonir khal and Rishibari khal are silted up which can not drain out water during heavy rainfall events;</p> <p>4. Congestion of water hyacinth is the major problem available almost all the khals and rivers, but the intensity is higher at the sweet water area (beel Dakatia) and low at saline water area (Khornia beel and Singa beel area). For the high intensity area farmers can not take the crops to their home through using water way;</p> <p>5. There are huge conflicts between farmers and fishers to control over the sluice gates. The Shoilmari sluice is important to drain in and drian out which basically controlled by the influentials of Gutudia UP Chairman. In beside of the Shoilmari sluice, the Keoratola sluice gate is also the major problem which affects for seed bed preparation and transplantation of boro rice.</p>
Common hazards	Water logging, river bank erosion, thunder storm, flood and heavy rainfall and water hyacinth congestion.
Cyclone shelters	03 (school cum cyclone shelter)
Obtained environmental clearance certificate (ECC)	Not yet conducted the EIA
Formulated environmental and social management plan (ESMP)	Not yet done
Formulated community based disaster risk reduction (CBDRR) plan	Not yet done
Recruited WMG environment and DRR Counselor	Not yet done
Members of WMOs included in UDMC	0
Opportunities for environmental and DRR activities	<p>1. The local people as well as the UP Chaimen and Members seems very helpful to repairing/rehabilitation of water control structures as they feels that their long term suffering with waterlogging might removed through these works; and</p> <p>2. The UDMCs are exists who understand their role and responsibility in emeregency preparedness. It is an opportunity to minimize the problems of water logging, water hyacinth congestion and other hazards.</p>

3. Development Action Plan

On the basis of the present situation and its key challenges as presented in chapter 2, a Development Action Plan has been prepared by the Blue Gold program, and is presented in this chapter.

3.1 Water Resources Management and Infrastructure

To develop a plan on Water Resource Management and Infrastructure a number of consultation meeting were held between 23rd January to 30th January, 2017 at 10 unions under three upazilas. After detailed discussion and arguments with the local stakeholders the following infrastructures were identified and validated for inclusion in the Blue Gold program for implementation. Embankment re-sectioning, retirement, drainage khals re-ecvation, repair of structures with gates, and supply of drainage pipes were considered as priority-1 work while re-excavation of few secondar khals and repair/re-sectioning of embankment in less vulnerable areas is considered as priority-2 and embankment re-sectioning in less vulnerable areas, construction of culverts and low cost temporary protective works were considered as priority-3 works².

3.1.1 Summary of Rehabilitation Works

SL. No.	Name of Work	Units	Quantit y	Estimated Total Cost, BDT
Priority 1				
1	Embankment Re-Sectioning	km	6.00	8,642,186
2	Embankment Retirement	km	1.50	15,000,000
3	Khal Re-excavation	km	49.50	61,450,000
4	Repair of Sluices	nos	11	34,802,349
5	Provision of pipes	m	1000	2,000,000
Priority 1 Total=				121,894,535
Priority 2				
6	Embankment Re-Sectioning	km	8.00	11,522,915
7	Khal Re-excavation	km	23.50	23,500,000
Priority 2 Total=				35,022,915
Priority 3				
8	Embankment Re-Sectioning	km	7	10,082,550
9	Construction of Culvert	nos	2	8,000,000
10	Temporary Protective Work (low cost)	km	1	7,750,000
Priority 3 Total=				25,832,550
Total cost for Rehabilitation Works in Polder 25=				182,750,000

Note: The items for rehabilitation works for this polder may change after WMA formation and field assessment by Zonal TA and BWDB engineers

A map showing proposed rehabilitation plan is given in Figure 5

² Actually all works are needed for efficient water management and to reduce health and environmental hazards in the polder. However, since fund is limited, prioritization will give a scope for phasing out the work depending on DPP provision and availability of fund. Priority-1 works include activities that are related to the safety/ immediate problem solution of the polder. Priority-2 works include activities that are required for proper functioning of the polder. If DPP allows and fund is available all works will be done.

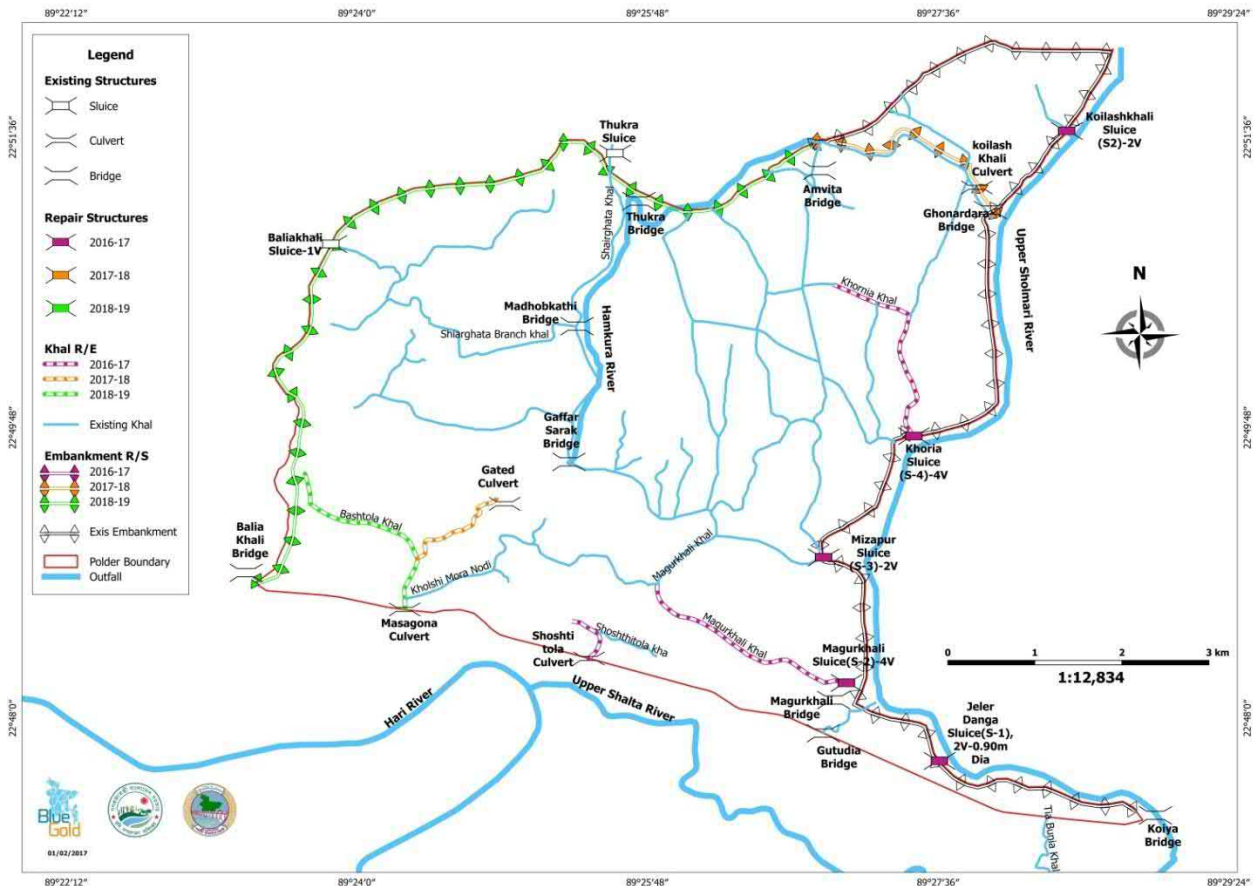


Figure 5: Proposed Rehabilitation Plan (map to be replaced)

3.1.2 Operation and Maintenance and Internal Polder Water Management

After rehabilitation the Water Management Association (WMA) will play an important role in operation and maintenance, on the basis of an agreement between the WMA and the concerned BWDB field Executive Engineer, to be finalised before the execution of the rehabilitation works. The O&M agreement will identify all operation and maintenance activities in the polder and delineate sharing of the responsibilities between BWDB and WMA. Small routine maintenance works will be implemented by WMA; and larger routine and periodic maintenance works implemented by BWDB. However, the real sharing can be anything according to the terms of agreement and mutual concurrence. The O&M agreement may also identify BWDB resources in the polder that can be used by WMA to partly or wholly mobilize resources for operation and maintenance. Technical knowledge will be provided by Blue Gold through training.

Based on this, in the first year after completion of rehabilitation, WMA's along with BWDB and TA Team will make operation and maintenance plans, implementation budget and resource mobilization plan. The WMGs will develop Internal Polder Water Management plans as part of their WMG Action Plans. All plans will be implemented by WMOs and BWDB with direct assistance from TA Team. In the second year after completion, as part of the exit strategy, WMOs and BWDB will make their plans as usual, but TA team, if available, will provide only backstopping support as and when required. At the end of second year WMO's along with BWDB will continue the O&M activities in line with the agreement.

In the meantime, the TA team will continue to work with the BWDB at different levels to find an institution basis which will encourage effective commitment to and action for fulfilling the BWDB commitments under the O&M agreement with the WMA.

Sl. No.	Activity	Time Frame	Responsible Actors	People to involve
1.0	Engineering assessment and topographic surveys	2016-2018	BWDB, TA-Engineering staff, Socio-Economists and CDFs	UP, WMO members and local elites
1.1	Site survey, design data collection, detailed design and preparation of work packages			
1.2	Pre-work measurements			
2.0	Formation of Labor Contracting Societies (LCS)	2017-2018	WMG, BWDB, TA- Engineering staff, Socio-Economists and CDFs	LCS, WMA Monitoring Committee, WMA
2.1	LCS training (WMG) and contractor orientation			
2.2	Construction monitoring training to WMAs			
3.0	Draft contract, tendering and work award	2017-2020	BWDB, TA-Engineering Staff, Socio-Economists, CDFs	WMA Monitoring Committee WMA and WMG Executive Committee
3.1	Resource mobilization and implement physical works like embankment re-sectioning/ construction, khal re-excavation and repair/construction of structures			
3.2	Construction monitoring			
4.0	Polder inspection and identification of O&M requirements	Before implementation of O&M works		
4.1	O&M agreement			
4.2	Implement catchment level water management and O&M plan			
5.0	Internal Polder Water Management	After main WRM infrastructure is implemented	SAAOs (DAE), XOs (BWDB), TA-Socio-Economists, Engineering staff COs and PFs	WMA and WMG Executive Committee
5.1	Identify WMGs interested to work along Community Agricultural Water Management (CAWM) model.			
5.2	CAWM planning			
5.3	CAWM implementation			
5.4	Monitoring of CAWM			
6.0	Back-up support in the yearly joint polder inspection and assessment of O&M requirements, CAWM by BWDB and WMA	2017-2020	BWDB, TA-Socio-Economists, COs and Engineering Staff	WMA and WMG Executive Committee, BWDB

3.2 Institutional Framework for Participatory Water Management

Activities to strengthen the Institutional Framework for PWM have been planned with multi-fold objectives: (i) to help the WMOs to become active and sustainable organizations, and able to participate responsibly in polder development activities (ii) stimulate effective women's participation (iii) to orient Union Parishads and other relevant stakeholders to support planned activities effectively.

Sl. No.	Activity	Time Frame	Responsible Actors	People to involve
1.0	Consultation meeting for Engineering Assessment	January 2017	Central, Zonal and Polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
2.0	Conduct UP & Upazila orientation	January 2017 to April 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE

3.0	Identify and support existing collective actions (CA) and liaise with their leadership	January 2017 to April 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
4.0	Conduct walk-through, mapping with CA leadership & key informants and data collection (household survey)	January 2017 to May 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
5.0	Form core group of interested CA leadership and organise horizontal learning	January 2017 to April 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
6.0	Conduct WLUA workshop with core group	January 2017 to May 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
7.0	Prepare PDP and submit to BWDB	January 2017 to March 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
8.0	Conduct catchment-level planning meetings to define WMG boundaries and collective actions	January 2017 to May 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
9.0	Facilitate and expand existing CAs	January 2017 to June 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
10.0	WMG EC formation and Registration	May 2017 to February 2018	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
11.0	Promote and implement new CAs with WMG as identified in the catchment level planning meetings	January 2017 to March 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
12.0	Provide selective WMG foundation courses using experiential learning methods	July 2017 to December 2018	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
13.0	Support WAP formulation and implementation of CAs with relevant sub-groups	July 2017 to June 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
14.0	Facilitate LCS formation of with Mobilize	December 2017 to June 2019	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
15.0	Organise CA exchange visits/horizontal learning	January 2017 to June 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
16.0	Facilitate networking and partnerships	January 2017 to April 2018	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
17.0	WMG Sub Committee formation (O&M Catchment Level & others in WMG Level)	July 2017 to July 2018	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
18.0	Regular catchment-level water management and O&M planning	January 2018 to July 2019	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
19.0	Continue assisting WMGs to improve performance	June 2017 to May 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE

20.0	Gender Workshop with LGI and other Stakeholders	May 2017 to June 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
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3.3 Agricultural and Marketing Services

The agricultural production and business development aspects of the Development Action Plan focus on the development potentials and required actions in relation to crops, fisheries and livestock while taking into account development potentials of specific value chains.

Sl. No	Activities	Time frame	Responsible actors	People to involve
Agricultural Services				
1.0	Tree plantation and homestead gardening for the utilization of homestead area through farmers field school	2017-2019	DAE, TA-CDFs, Master Trainers, Agricultural Expert, FTs	WMG and WMA members
2.0	Activities to improve crop production: a. FFS on , homestead garden (vegetables) and nutrition, b. Women focused FFS c. Demonstrations / trials on winter vegetables d. Field day on home garden and nutrition activities of FFS.	2017-2019	DAE, TA-CDFs, Master Trainers, Agricultural Expert , FTs	WMG and WMA members
3.0	Activities to improve livestock production: a. Poultry and nutrition FFS b. Livestock vaccine cold chain at WMG/WMA level c. Community Livestock Worker training d. Community Poultry Worker Training e. Field day on livestock activities	2017-2019	DLS, TA-CDFs, Master Trainers, Livestock Experts, Agricultural Expert, FTs	WMG and WMA members
Business Development				
1.0	Workshop with WMOs to promote CA, Business Planning and private company linkage	July-Aug 17	BDC, CDFs	WMG/WMA
2.0	Linkage Building meeting/Workshop with VC actors	July-Aug 17,18,19	BDC, CDFs, RFs	WMG/WMA
3.0	Workshop with GL/RF /FT/LF on agriculture development (FFS with market orientation) business networking and Linkage	July-Aug 17	BDC, CDFs, RFs	WMG/WMA
4.0	Linkage workshop between RF/ CF/LF/FT & Market actors	June 17, 18,19	BDC, CDFs, RFs	WMG/WMA/IP
5.0	Actors meeting with WMO for Linkage, Discussion negotiation and Intervention designing	Nov-17,18,19	BDC, CDFs, RFs	WMG/WMA/PS
6.0	Promote and implement new CAs with WMG as identified in the catchment	2017-2019	BDC, CDFs, RFs	WMG/WMA

	level planning meetings			
7.0	Organise CA exchange visits/horizontal learning	Apr 17-Mar 20	BDC, CDFs, RFs, FTs	BWDB/DAE/UP/DLS/
8.0	Input traders capacity building	Nov17	Zonal Team	PS/DAE/DLS

3.4 Environmental Sustainability and Disaster Risk Reduction

The environmental sustainability and DRR aspects of the Development Action Plan focus on: i) compliance with social and environmental management regulations; and ii) strengthening DRR activities.

Sl. No	Activities	Time frame	Responsible actors	People to involve
1.0	Obtaining Environmental Clearance Certificate from DoE	2017-2018	Outsourcing SPs	BWDB, TA-Env. Expert, TA-Engineer Team, Polder Team
2.0	Environmental compliance monitoring and quarterly reporting to DoE	2018-2020	BWDB field staffs, TA-Env. Expert	TA-Engineer Team, Polder Team, XEN of BWDB
3.0	Formulation of Environmental and Social Management Plan (ESMP)	2017-2018	TA-Env. Expert, Polder Team	Socio-Economists, TA-Engineer Team,
4.0	Reconstitution of UDMCs	2018-2019	Outsourcing SPs/Training Team	TA-Env. Expert, Socio-economists, Institutional Advisor,
5.0	Recruit WMG's Environment and DRR Counsellors	2017-2018	WMGs, Polder Team	TA-Env. Expert, Socio-economists, Institutional Advisor,
6.0	Formulation of Community Based Disaster Risk Reduction (CBDRR) plan	2017-2018	TA-Env. Expert, Polder Team	Socio-Economists, TA-Engineer Team,
7.0	Disaster Preparedness and implementation of CBDRR plan	2017-2020	WMGs, Polder Team	TA-Env. Expert, Socio-economists, Institutional Advisor,
8.0	Training to Env. and DRR Counselors and UDMCs on Env Safeguard and Dis. Mgmt./coordination workshop with UDMC	2018-2019	Outsourcing SPs/Training Team	TA-Env. Expert, Socio-economists, Institutional Advisor,
9.0	Orientation to LCS leaders and Contractors and WMA leaders on environmental clearance Certificate.	2017-2018	Engineer Team, TA-Env. Expert,	XEN of BWDB
10.0	Awareness raising program	March 2017 to June 2020	Env. and DRR Counselors, TA-Polder Team	Env. Expert, Zonal Socio-Economists
10.1	Discussion reducing excessive using of fertilizer and pesticide at WMG meeting, FFS & MFS session			
10.2	National and International Day observance related to environment and DRR			
11.0	Integrate ESMP and CBDRR with the WAP, Annual Polder Action Plan and UDMC's DRRAP	2017-2020	TA-Env. Expert, ZSEs, COs	WMA & WMG executive committee

4. Planning Timeline

Blue Gold Program, BWDB Polder Completion Timeline

Polder - 25

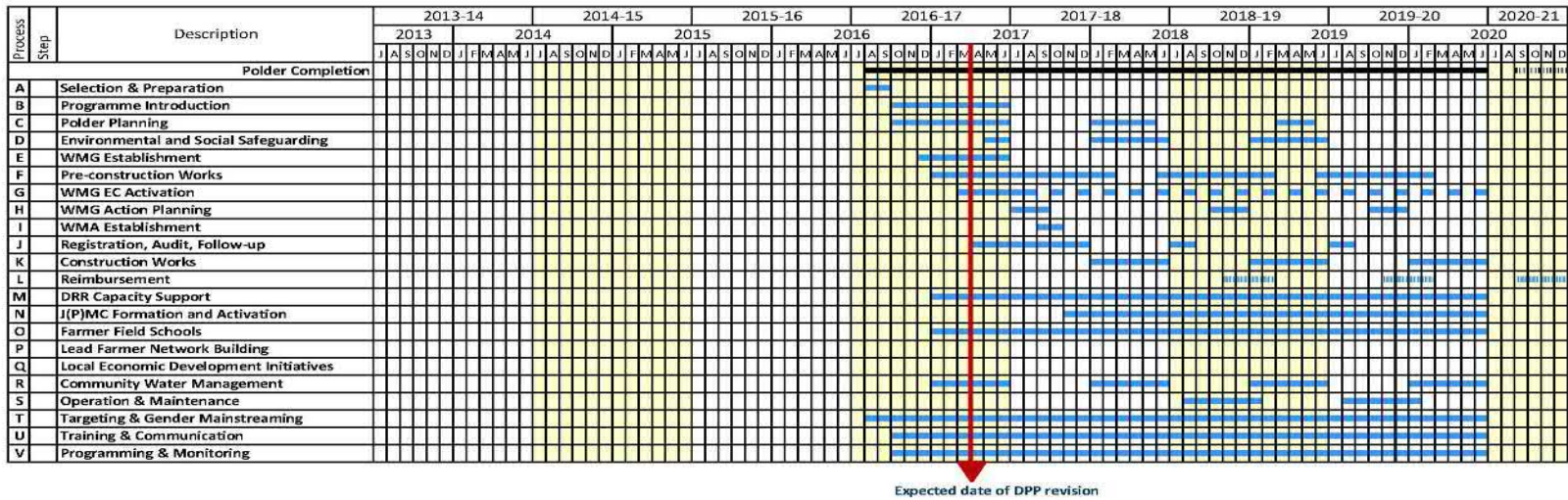


Figure 6: Polder Completion Timeline

5. Polder Budget

The overview of the estimated allocated budget for the polder activities in polder 25 is presented in Table 6.

Table 6: Polder 25 Budget

S.N	Task Name	Total Amount	
		BDT* ^{x100000}	EUR** ^{x1000}
1.0	<i>Institutional Framework for Participatory Water Management</i>	36.00	42.35
2.0	<i>Main Infrastructure</i>	1827.50	2150.00
3.0	<i>Internal Water Management</i> <i>(Polder-wise budgets are based on an average amount per CWM-site. In reality budgets will vary per CAWM-site)</i>	9.00	10.59
4.0	<i>Agriculture & Marketing Services</i> <i>(Actual polder-wise budgets will be higher as exact #FFS per polder will be determined later, estimated DAE contributions have been included in these estimations)</i>	31.62	37.20
5.0	<i>Environmental & Social Management / Disaster Risk Reduction (DRR)</i>	40.00	47.06
6.0	<i>Training</i>	132.62	156.02
	TOTAL	2076.74	2443.22

Note: Exchange rate is 1 EURO=85 BDT

Appendix 1. PDP Formulation Process³

The Blue Gold Program makes use of the 6-step planning approach described in the Guidelines for Integrated Planning for Sustainable Water Resources Management (IPSWARM) that was adopted by the BWDB in 2008 for its medium sized existing Flood Control and Drainage schemes. Polder Development Plans are the 4th step which follows after the participatory data collection and needs assessment (step 2) and the formation of WMOs (step 3).

In the PDP Formulation Process one can distinguish the following activities/tasks and their outputs (see Figure 6)

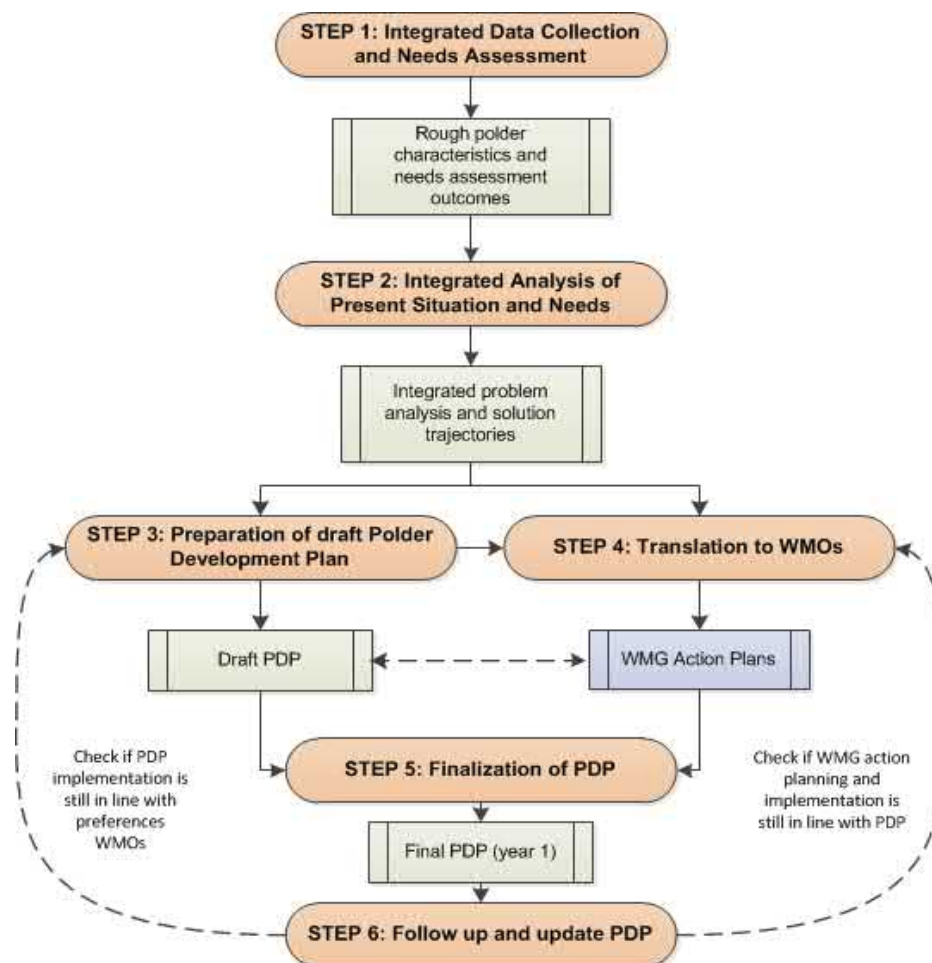


Figure 7: The steps of the PDP Formulation Process

Explanation of the different steps:

STEP 1: Integrated Data Collection and Needs Assessment: For the purpose of planning, data is collected through various methods: collection of existing information from governmental departments, observations in the field, and informal interviews with people living in the polder area and key stakeholders, focus group discussions, consultation meetings, engineering surveys, agricultural surveys and value chain mapping and analysis. The various components do their field data collection individually, but coordinate their work to avoid overlap, gaps and misunderstanding among WMOs. The results and outcomes of each

³ For the preparation of this PDP, focus group discussions were conducted with the existing WMOs and Ups. Polder Team and Zonal Experts were actively involved to in the process of specific data collection. In the case of polder 25, after drafting the PDP it was shared with the representatives of WMOs and UPs for data validation and updating

field visit, meeting, interview or focus group discussion are recorded. Data among others includes the Integrated Needs Assessment executed by component 1 and 2 (WMO strengthening); engineering survey details collected by component 2 and data collected by component 4 in relation to the value chain selection and analysis. The rough data are managed by the GIS specialist and used to generate specific geo-information maps or figures, which are published on an open source website (Lizard Portal).

Outputs:

- Rough data of polder characteristics
- Needs assessment report

STEP 2: Integrated Analysis of Present Situation and Needs: The integrated data collection and needs assessment is used to describe the present situation of the polder by summarizing the collected info in tables, figures, pie charts and maps with supporting text, as one of the core chapters of a PDP. The present situation in combination with the Needs Assessment is an input for a joint SWOT (strengths, weaknesses, opportunities, threats) analysis workshop within the Blue Gold Team. The outcomes of this SWOT exercise are used in a second workshop at polder level to formulate solution trajectories and activities for polder development. Extra attention is paid to address the severity of problems and the potential of opportunities while selecting activities. The fact that Blue Gold has a limited scope and budget, and cannot address all needs, only those connecting to program objectives and those financially feasible are taken in consideration.

Output:

- An integrated problem analysis and solution trajectories

STEP 3: Preparation of draft Polder Development Plan: After the integrated analysis, a draft Development Action Plan (including actions related to strengthening WMOs; water resources management; agricultural production; business development; sustainable environmental management; community based disaster risk management; gender and institutional strengthening) is developed. The Blue Gold Team organises an internal meeting to make sure the planned activities across components are coherent and support each other and cross-cutting issues are integrated well (avoid overlaps and gaps). The draft Development Action Plan is integrated with the present situation and the integrated problem analysis and solution trajectories to result in a draft PDP.

Output:

- Draft PDP

STEP 4: Translation to WMOs: While the draft PDP is being developed, WMG Action Plan (WAP) meetings are organised for all WMGs. The proposed PDP activities of Blue Gold are presented and the potential actions for the community are discussed. The Blue Gold staff support the WMG to prepare a WAP on the basis of their preferred actions and the draft PDP.

Output:

- WMG Action Plans (WAPs)

STEP 5: Finalization of PDP: On the basis of feedback provided by the WMA and possibly other stakeholders like UP, the Blue Gold Team finalises the PDP. The PDP is forwarded to interested stakeholders and a limited campaign for awareness creation at local level is planned and carried out.

Outputs:

- Final PDP

STEP 6: Follow-up and update of PDP: Field staff of Blue Gold initiates the implementation of activities with WMOs. Regular follow-up meetings are held, participatory monitoring to keep track of implementation is stimulated and the WAPs are regularly updated by the WMGs. Furthermore the developments of specific value chains, gender issues, disaster risk reduction and environment actions, which are to be incorporated in the WAPs, are discussed. If required, PDPs are updated after 1 or 2 years.

Appendix 2: Water Management Infrastructure of Polder 25

Embankment

Total length of the embankment is about 46.00 km. The entire embankment is an interior embankment with a crest width of 4.27m and crest level of 4.27m PWD.

Sluices

There are 17 Sluices in this polder. These are:

S.N.	Name of Sluices	Number of Vents	Size, (mxm)	Location, km	Remarks
1.	Solua Sluice	7V	1.52 X 1.82	4.80	
2.	Amvita Sluice	9V	1.52 X 1.82	9.00	
3.	Thukra Sluice	5V	1.52 X 1.82	10.50	
4.	Modhugram Sluice	2V	1.52 X 1.83	Data not yet available	
5.	Mikshi Mill Pipe Sluice	3V	900 mm dia	Do	Inactive, Outfall Dead
6.	Chailor Sluice	1V	Data not yet available	Do	Inactive, Outfall Dead
7.	Baliakhali Pipe Sluice	4V	900 mm dia	Do	Inactive, Outfall Dead
8.	Pashuria Pipe Sluice	3V	900 mm dia	Do	Inactive, Outfall Dead
9.	Pachpota Sluice	1V	Data not yet available	Data not yet available	Inactive, Outfall Dead
10.	Kharnia Sluice	1V	1.52 X 1.82	24.70	
11.	Chahera Sluice	2V	1.52 X 1.82	32.90	
12.	Sholghati Pipe Sluice	1V	900 mm dia	Data not yet available	
13.	Keoratala Sluice- 2	4V	900 mm dia	Data not yet available	
14.	Keoratala Sluice- 1	1V	1.82 X 1.22	36.00	
15.	Dahokhola	1V	1.82 X 1.82	40.00	
16.	Beel Salatia	1V	1.52 X 1.82	41.30	
17.	Katenga Pipe Sluice	4V	900 mm dia	44.70	Inactive. This part of Hari river is heavily silted up

Drainage Outlets

There is no Outlet in this polder.

Irrigation Inlets

There are no Inlets in this polder.

Khals

There are about 114 recognizable khals with branches and having a total length of above 299.00 km. The main khals are shown in Figure 2.