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Kingdom of the Netherlands



Department of Agricultural Extension (DAE)



Polder Development Plan (PDP) – DRAFT

Polder 47/4

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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
CDF	Community Development Facilitator
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
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
KJDRP	Khulna-Jessore Drainage Rehabilitation Project
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 realized 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 47/4 is managed by the Bangladesh Water Development Board (BWDB) and was constructed during the year 1961-1964. It is located in Dhulasar union (part), Mithaganj Union (part), Dalbuganj Union (part) and Baliatali union under Kalapara upazila, Patuakhali district. It is surrounded by Andharmanik river in the north, Hauder Varani river in the north-west, Dhulasar and Char Chapli river in the south, Rabnabad and Tiakhali river in the east and Pakhyapara river in the west (shown in the figure 1). 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.

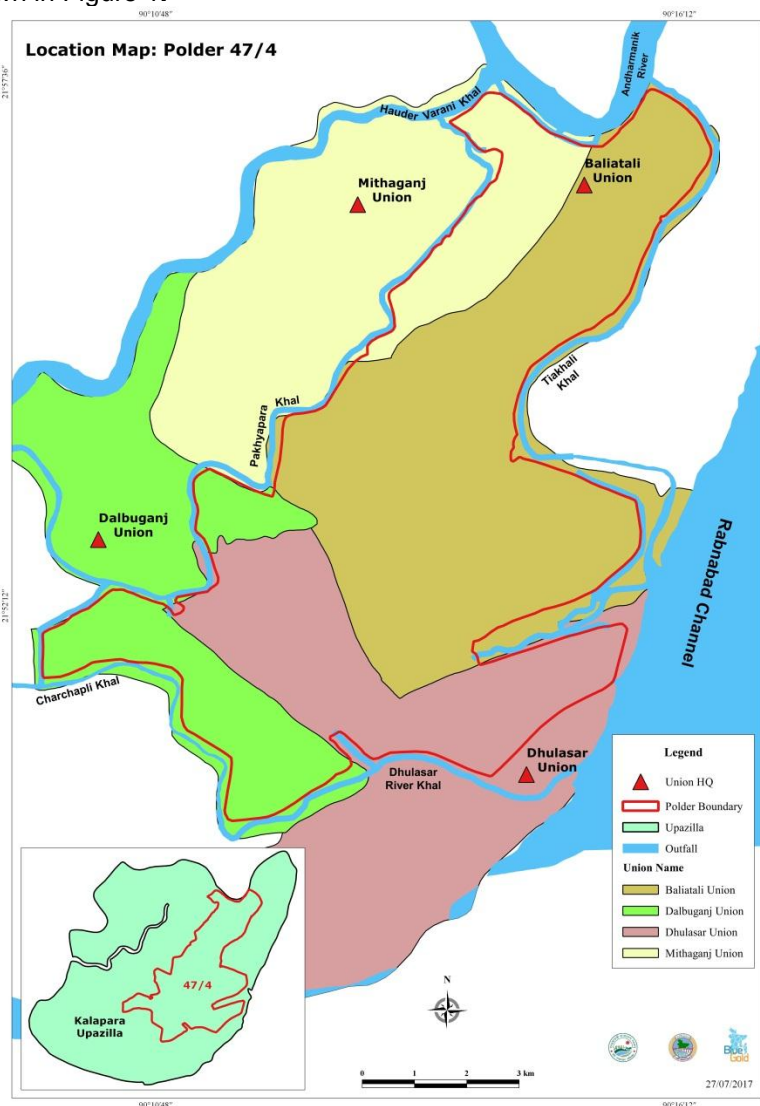


Figure 1: Location of Polder 47/4 in Kalapara Upazila under Patuakhali District

Table 1: Main Physical and Demographic Characteristics of polder 47/4

Characteristics				
Included Upazila(s)	Kalapara			
Included Unions	Baliatali, Mithaganj, Dhulasar and Dalbuganj			
Polder boundary (in km)	59.00			
Total number of Mouzas	12			
Total polder area (in ha)	6,600			
Total number of households in the polder	11,853			
Total number of catchments	27			
Total cultivable land (in ha)	5,940			
Population	31,520	M 15270	F 16250	
Literacy rate	65%			
Major occupations	Agriculture 70%	Fisherman 15%	Business 5%	Other 10%
Economic condition	Rich: 10%	Middle class:40%	Poor: 50%	
Status of seasonal labour migration	Seasonal labour migrate 30% to Dhaka, Khulna, Chadpur, Rangamati, Narayanganj and Chittagong, and 70% to nearer others district for working as ricksha puller; labour at industry, construction work and brick field.			
Status of internal road communication	The polder is very close to the Bay of Bengal. The internal roads consist of about 30 km of bituminous road, 5 km of brick soling road and 50 km of earthen road.			

2.2 Water Resource Management and Infrastructure

Main features of the water resource management and infrastructure in polder 47/4 are highlighted in Table 2. Figure 2 shows the existing water management infrastructures including khals in polder 47/4. Further details can be found in Appendix 2.

Table 2: Main Features of Water Resource Management and Infrastructure in Polder 47/4

Features			
Length of embankment (in km)	59.00		
No. of drainage and flushing sluices	27 (Flushing-7, Drainage- 15 and Drainage -cum-flushing-5)	Good condition: 05	Poor condition: 21 Damaged: 01
No. of inlets	02	Good condition: 02	Poor condition:00
No. of (drainage) outlets	00		
No. of khals	49 (28 main and 21 secondary khals)		
Length of khals (in km)	190		
Main outfall rivers, drainage khals, Drainage sluices, Surface Drainage sluices and Several sizes Flushing Sluices	<p>Main rivers: Andtharmanik on the North, Charchapli and Dhulasar on the South-West, Rabnabad and Tiakhali on the East side.</p> <p>Main drainage khals: Shanirvor khal, Pakhyapara bazar khal, Pakhyapara khal, Baiddopara khal, Purba Madhukhali khal, Baliatali khal,, Karamjapara khal/Companypara khal, Amtali khal, Uttor Lemupara khal, Charbaliatali khal, Bablatala khal, Noyapara khal, Anantapara- 1/Modiar khal, Anantapara- 2/Hetalboniar khal, Koralia khal</p>		

	<p>Drainage and Surface Drainage Sluices: Pakhyapara bazar Sluice, Pakhyapara Sluice, Baiddopara Sluice, Purbo Modhukhali Sluice, Kabira khal Sluice, Kathakhali Sluice, Baliatoli-1 Sluice, Baliatoli-2 Sluice, Char Nazir Sluice, Karamjapara/Companypara Sluice, Karamjapara Sluice, Amtoli Sluice, Uttar Lemupara Sluice, Char Baliatoli Sluice, Bablatola Sluice, Bablatola Bazar Sluice, Anantopara-1 Sluice, Anantopara-2 Sluice, Koralia Sluice, Borkatia Sluice, Monoshatali Sluice and Shikdar khal/ Adamali Sluice.</p> <p>Flushing Sluices: Madhukhali Sluice, Aiumpara Sluice, Choto Baliatoli Sluice, Char Dhularsar Sluice, Bablatola Old Sluice.</p> <p>Inlet:Mithaganj inlet and Monashatli inlet</p>
Situation of tidal and river flooding	There is no tidal and river flooding that affects polder 47/4. The Char Dhularsar village area (near anantapara sluice) is prone to overtopping which is under repairing. But there are internal floods due to heavy rainfall in monsoon.
Locations with water logging and siltation.	There is a little bit water logging in the char Baliatali beel, Madhukhali beel, Nayapara beel, Dakshin Barabaliatali beel and Karamjapara beel of this polder area during the post monsoon (August-November).
Most river erosion prone area	There are five erosion prone zones which are Banglabazar (near Mithaganj), Katakali (near Monoshatali village), Paschim Dhularsar School Ghat, Char Dhularsar and Char Baliatali.
Other relevant water issues	Polder 47/4 is a saline prone area. Due to salinity, land remains fallow in the Rabi season. This polder is also susceptible to tropical cyclone and tidal surge. Three major cyclones have hit in this polder during the recent years i.e. Sidr in 2007, Aila in 2009 and Mohasen in 2013.
Key challenges in effective water management	<ol style="list-style-type: none"> 1. Most of the khals are silted up which resulted in poor drainage and internal flooding during monsoon. . 2. Many khals are used for fish culture. For fish culture the local powerful leaders establish cross dam in the khals.
Challenges in planning construction of water infrastructures within polder area	<ol style="list-style-type: none"> 1. There are challenges to stop local powerful leaders to fish farming in the khals. This conflict may hinder the planning of a sustainable water management system. 2. To remove existing cross dam from the khals.
Current internal polder water management practices	Most of the sluice gates are controlled by few local influential people. Now there is no proper Internal Polder Water Management system are being practices in the polder
Overall condition of internal polder water management	Very poor
Opportunities for internal polder water management	<ol style="list-style-type: none"> 1. Community led Agriculture Water Management will be an opportunities for internal polder water management; 2. Re-excavation of major khals and re-sectioning of embankment; and 3. Repair and/or re-constriction of sluice gates.

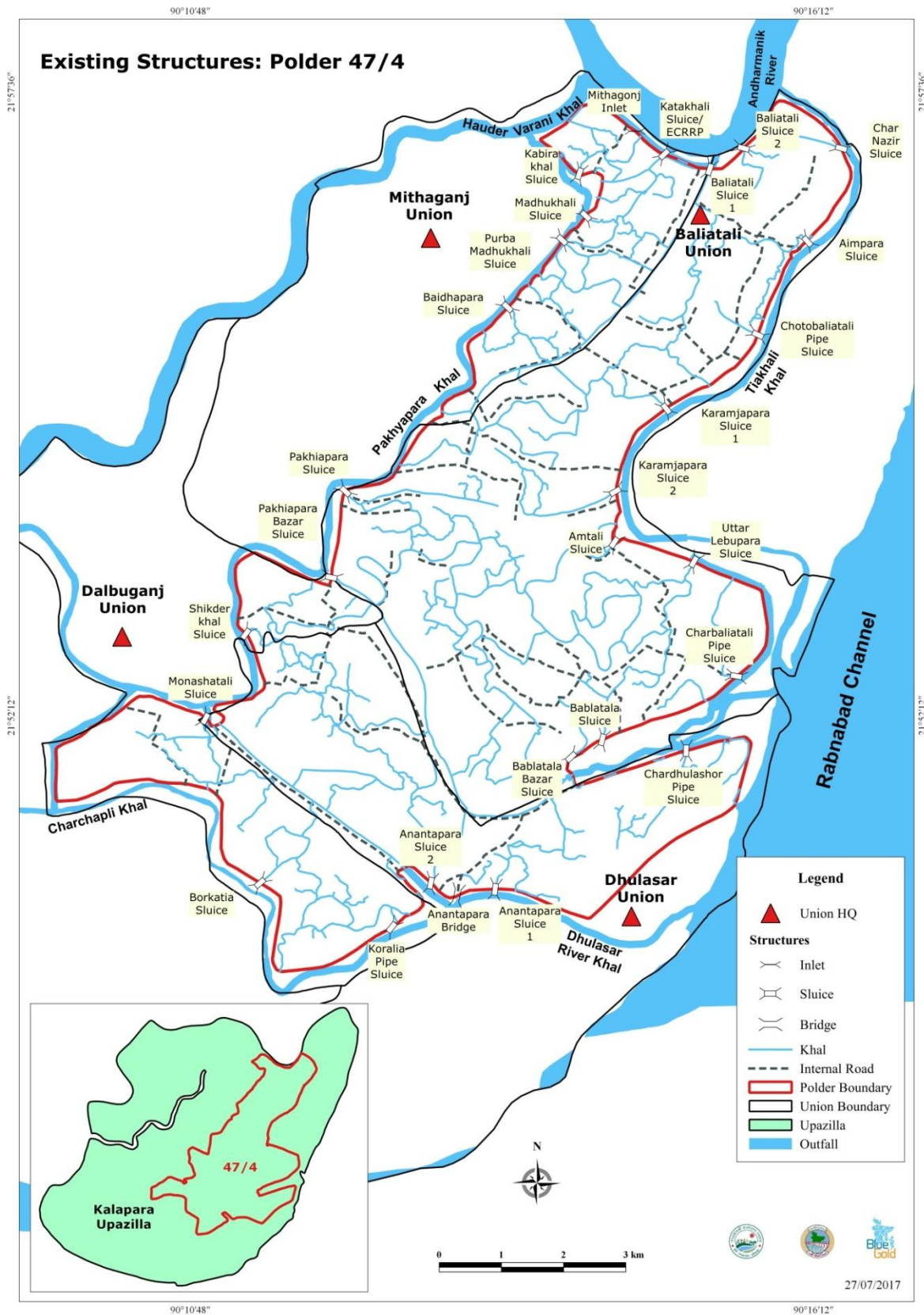


Figure 2: Map of Polder 47/4 showing the existing Khals and Water Management Infrastructure

2.3 Institutional Framework for Participatory Water Management

The main institutional actors in polder 47/4 are Union Parishad (UP), its wards, various Local Governmental line departments, a number of NGOs, Micro-finance Institutions, Market Committees and Union Disaster Management Committees (UDMC). Main characteristics of institutional actors are highlighted in the Table 3. Proposed WMGs and its areas is shown in the figure 3.

Table 3: Main characteristics of the Institutional Framework of PWM in Polder 47/4

Characteristic	
Number of WMGs	Currently there are no WMGs, neither formed by the previous projects nor formed by the Blue Gold Program yet. The map below in Figure 3 shown the tentative areas of proposed WMGs.
Members of WMGs	-
HHs being part of WMGs	-
Number of WMAs	-
Female representation in WMGs	-
Total deposited fund (BDT)	-
Total savings of WMGs (BDT)	-
Total number of WMGs with O&M fund	-
Names of projects and organisations with similar / related activities	-
Existing WMOs linkages with other stakeholders	-
Number of WMGs member including in UP standing committee	-
O&M agreement signed with BWDB	-
Current participation of WMOs in O&M	-
Names of projects and organisations with similar / related activities	Integrated Farm Management Component (IFMC) implemented by DAE (DANIDA funded), Disaster Management Program implemented by World Concern Bangladesh (Dutch funded) and Women Empowerment Project implemented by DAM (USAID funded).
Existing conflicts on water management	There is a conflict between local rice farmer and fish farmer regarding water use for crop production and fish farming.
Key challenges in strengthening PWM	<ul style="list-style-type: none"> • This polder area is highly influenced by ruling political party. • As it's a disaster prone area and the inhabitants of this polder used to get external aid support which has made them dependent.
Key challenges in relation to women participation	Here women are still in backward situation and male are not willing to allow them come out. Religious blindness are still now exists.
Key opportunities in PWM	<ul style="list-style-type: none"> • DAE is currently implementing the IFMC program, through which numbers of FFS and IPM groups are organized are currently active; • Traditionally there are number of collective actions which could be a basis and focus to organize people in the PWM; • Revitalization and/or linkages with Krishok Moitry Sangathan (42 number of groups of which 27 are women groups)

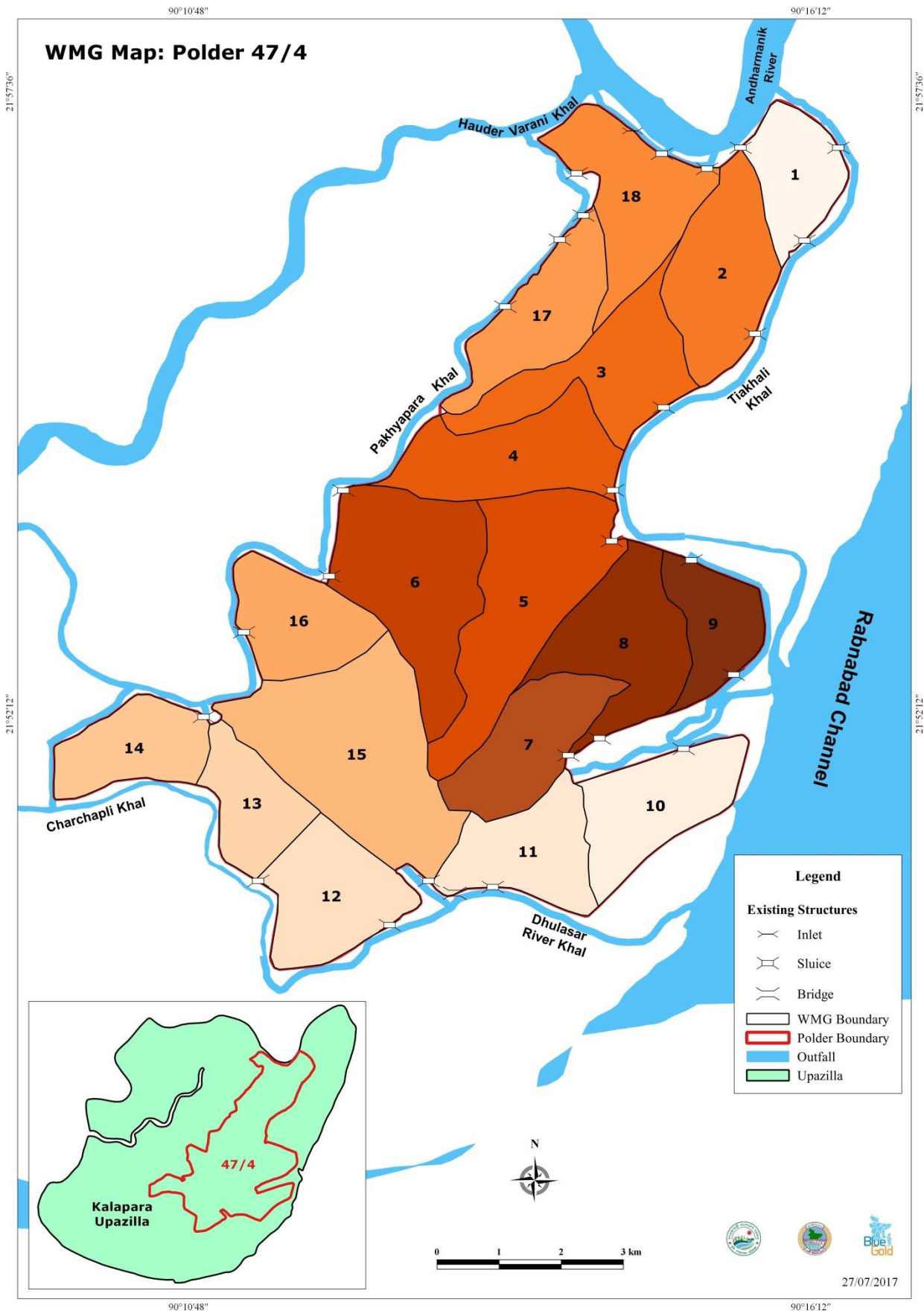


Figure 3: Proposed WMGs and its areas in Polder 47/4

2.4 Agricultural and Marketing Services

In polder 47/4, most polder dwellers are involved in crop production and fish culture. Fish culture and Livestock rearing is to some extent important. The most important characteristics and challenges of agricultural production and marketing services can be found in Table 4.

Table 4: Main characteristics of Agricultural and Marketing Services in Polder 47/4

Characteristic	1. T. Aman (HYV)	2. Grass Pea	3. Mung bean
Main crops (top three)			
Current most common cropping pattern	Fallow-Fallow-T. Aman Fallow-Fallow-T. Aman Grass Pea –Fallow – T. Aman Falon –Fallow – T. Aman Mung bean-Fallow-T. Aman Chilli-Fallow – T. Aman Ground nuts-Fallow-T.Aman Sweet Potato-Fallow-T. Aman Fallow-Aus-T. Aman		
Current cropping intensity	180%		
Main vegetables	Winter: Bottle Gourd, Okra, Country Bean, Red Amaranths, Sweet Gourd, Bean, Spinach etc. mainly in the homestead. Radish finger, Maize, Sunflower Summer: Indian Spinach, Country bean, Ass gourd, Brinjal, Snake gourd, Ridge gourd, Amaranths, Bitter Gourd etc. mainly in the homestead.		
Main fruits	Coconut, Mango, Guava, Water melon, Banana and Jujube		
Available agricultural machinery	In polder 47/4 there are some agricultural machinery to manage the agricultural activities. Especially farmers use power tiller, thresher machine, irrigation pump, spray machine, harvester etc. as well as country plough also prevails here. But the quantity of this machinery is limited to service for the farmers as their requirement. A sufficient numbers of Rice Husking Machines are available in some forward locations of the polder.		
Present irrigation practices	In polder 47/4 approximately 2% lands come under irrigation facilities especially for cultivating Boro and vegetables in Rabi season.		
Availability of inputs	Seed, fertilizer, pesticide, farm machineries, poultry feed and fish feed are the main inputs in agriculture sector. Some input companies and private sectors have been working in this upazilla and also they are established close connection with farmers through the dealership system. Inside the polder area Cafco, Jamuna, Cargil, Syngenta, ACI, Buyer Crop Science, Square, Mega Feed, Aftab etc. are available for providing input services.		
Current knowledge on proper input use	Farmers have some knowledge about the quality seed; they also used hybrid seed for vegetables cultivation. In rice production farmers do not follow proper doze of fertilizer, pesticides. Besides vegetables farmers also use high volume of pesticide and farmer always use higher number of seeding (7-8 seedlings) and not maintaining proper spacing for T. Aman cultivation.		
Important business trend in crop production	Paddy and white fish (Capture fish) especially river fish business are rapidly increasing. Farmers sell about 70-80% rice and 20% white fish after their consumption. Fish cultivation and poultry rearing are increasing in the polder area. Road communication is improving, services and modern technologies are becoming relatively better available and the knowledge of farmers is increasing. Moreover, high market demand is making the farmers interested in producing market-based product.		
Key challenges in agriculture	1. Saline water intrusion during the rabi season in to the branch khals is a big problem for agriculture;		

	<ol style="list-style-type: none"> 2. Lack of irrigation during winter 3. Extreme weather events like Cyclone, Storm Surge and High tide badly effects to the agriculture productions
Percentage of households owning livestock	Cattle 38%; Goat – 12%; Poultry – 80%; Duck-60%.
Availability of inputs for livestock	The farmers of the polder 47/4 rear cow for milk and some for meat and poultry for meat. Poultry feed are available in polder markets. Due to salinity and shortage of pasture, enough fodder for livestock are not available in the polder area.
Important business trend in livestock	Local Milk- Collectors (<i>Goala</i>) are the prime buyers of milk from the milk producing households. There are some Faria who buy local poultry egg and cattle from the farmers. Farias purchase cattle, poultry and eggs direct from local markets but sometimes they visit door to door and purchase directly from farmers house. The demand and price of local breed of poultry is increasing.
Key challenges in livestock	<ol style="list-style-type: none"> 1. Huge scarcity of fodder particularly in dry months while salinity intensity become high; 2. Lack of knowledge about improved technology; 3. Lack of vaccination facilities and medicine; 4. Around more than half of the year cattle depend on dry straw; and 5. Poor housing and management of livestock
Percentage of households involved in fish culture	75% of the households have culture ponds of which 40 % ponds contain year round water. 40% people sell fish after their consumption.
Types of fish	Several type of white fish species e.g. Tilapia, Pangus, Rui, Katla, Mregel, Sliver carp, Thai puti, Grass carp and prawn (<i>Golda</i>) farming are the main fish in polder 47/4. Also some farmers in this polder are involved in Shrimp culture in limited extend
Availability of inputs	<p>There are five fry nurseries or hatchery in the area. Bhai Bhai Hatchery produce Spawn through induce breeding and Nurseries collect Spawn from Bhai Bhai Hatchery and other hatcheries located in distance upazilas and Districts.</p> <p>Fry traders collect fingerlings from the nursery (five nurseries) which prevail in the polder area and also sell fingerlings in the polder areas and adjacent areas.</p> <p>Fish feed is available in the local market. Fish medicines also available in the Kalapara market that is 5-12 km distance from the polder area.</p>
Important business trend in fisheries	Mainly fish farmers sells their catch (Capture) fish to the particular Arot/Depo with low price, since fishermen receive money in advance with a condition of selling fish to the Arot/ Depo who provide advance money as Dadon. There is large number of 'Dadan' business are available in the polder. Fishermen catch fish in the Bay of Bengal and others adjacent river like Andhermanik and sell to the Mohazan. Mohazan sell this fish in the different market in Barisal, Dhaka, Khulna, etc. RFLDC-DANIDA funded project extended fish culture in the polder area. This is mainly carp fish and culture for their own consume.
Key challenges in fisheries	<ul style="list-style-type: none"> • Saline water intrusion; • Quality and food safety; • Disease problem; • Lack of knowledge on proper management • Lack of quality fingerlings;

	<ul style="list-style-type: none"> • Low quality feed; and • Extension facilities are less.
Existing extension services	DAE has 3 Sub Assistant Agriculture Officers (SAAOs) assigned in the polder area. DoF has one Upazila Fisheries Officer for whole Upazila and one Field Assistant for Union level to assist in fisheries extension services providing new technologies. Overall, their services are not sufficient due to lack of manpower; also the services mostly address big and medium sized farming households. Upazila Fisheries Department provides training to the selected farmers. They have some local extension agents who provide technical support to the farmers. DLS has no field staff. Some of the NGOs and different companies are also providing extension services for livestock
Name and location of markets	In polder 47/4 there are six markets which including Bablatola bazar, Choto-Baliatoli bazar, Joybangla bazar, Dalbuganj bazar Surdugi Chonkhola bazar and Pakhyapara bazar
Products provided/ marketable products	In polder 47/4 there are many products – rice, vegetables, poultry eggd, pulses, some fruits etc. are main marketable products.
Surplus destination of products outside polder	Vegetables, rice, fish, milk and egg are the main agricultural products of polder 47/4. After family consumption farmers sell the surplus rice in the local market. A small portion of rice go to Chatals (Rice mill) located in Kalapara and a big volume of rice go to Dhaka, Jhenaidha, Khustia and Meherpur districts. The surplus vegetables, fish, milk, eggs etc. sell in the local markets.
Main value chain actors	The Blue Gold program not yet select any value chain for this polder but T. Aman/Felon/Grass pea/carp fish/tilapia/poultry might be the potential value chain of this polder. There are about 6-10 permanent input traders located at different markets. Besides, there are about 40-50 fish Arottdars/Godi (middle man) in this polder; they have a permanent setup for fish value chain. There are some Faria/Arotder/Paiker/Chatua available in the polder who are involved in rice/pulses/chilli/groundnuts/egg/poultry/cattle/fish marketing. There are some inputs company representatives employed for marketing of inputs.
Key challenges in marketing	<ol style="list-style-type: none"> 1. The farmers are not yet acquainted with collective action for sell bulk products. It will take a while to change their mind-sets for collective action; 2. Farmers pay high prices for low quality inputs and get low prices for their products as they mostly sell at farm gate and syndicates control the market; 3. Lack of knowledge on improved production technology and postharvest technologies (timely harvest, drying, grading, packaging etc.). 4. Farmers don't have minimum of market orientation and awareness about how to make the farming more profitable.

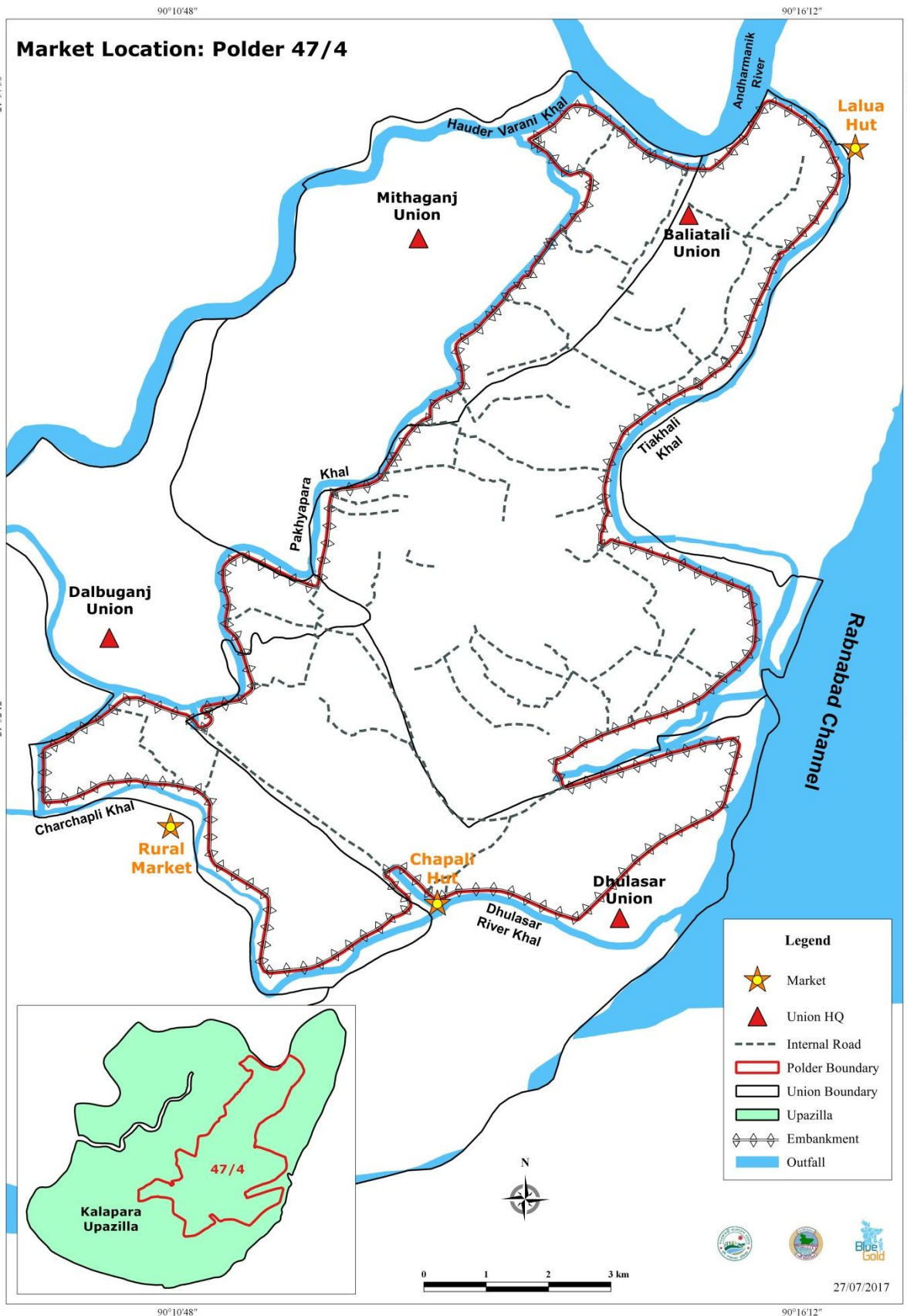


Figure 4: Markets and Union headquarters in Polder 47/4

2.5 Environmental Sustainability and Disaster Risk Reduction

Table 5: Main environmental and DRR characteristics of polder 47/4

Characteristics	
Existing environmental problems	<ol style="list-style-type: none"> 1. The polder dwellers mainly suffer from drainage congestion during mid-July to mid-November due to natural (i.e. siltation etc.) and man-made causes (i.e. blockage at the rivers and canal for culturing fish). Among the 4 unions the Baliatola union is prominent in context on drainage congestion. The FGD findings reveals that the area Tulatola beel, Choto Baliatoli, Pokhiyapara beel, Boga Khalir beel and Charbaliatoli beel under Baliatali union; Baultali and Tarikatar beel under Dhulasar union; Tegachhiar beel under Mithaganj union and Kortaliar beel under Dalbuganj union are most prone to drainage congestion which effects most to the seed bed preparation for Aman rice cultivation. 2. The rivers and khals in the polder area are tidal fed. As the local people claimed that minor surface water salinity existed in the area. Around 80% people are depends on deep tube-well as source of drinking water while around 15% people depends on Kup (protected dug well) water and 5% people depends on pond water. 3. The UP Chairmen and Members claimed that the poor people mostly are suffering with health hazards due to two major causes i. the drinking water is contaminated with Iron and ii. There is sanitary problem, the latrine are connected with natural khals in most cases. 4. There made a blockage for fish culture at Baliatali river by the local influential in 2/3 years back which made obstacles to fish migration and fish diversity at the natural wetlands. 5. Generally fertilizer application exceeds recommended levels for HYV Aman. The SAAO working in this area reported that the pesticide 'Virtako (produced by Syngenta)' is widely using for Aman cultivation.
Common hazards	Tropical cyclones accompanied by storm surges comes first while water logging considered as second hazards according to consideration of severity of effects and frequency of problem occur. The Aiumpara sluice, Modhukhali sluice, Baliatala sluice, Bablatala sluice, Dakhin Charpara outlet, Anantapara sluice, Koralia sluice and Chardhulashor sluice are in bad conditions which accelerate problem of drainage congestion.
Cyclone shelters	There are in total 25 cyclone shelters (in Baliatali-7, Dhulasar-8, Dalbuganj-4 and Mithaganj union-6) which mostly are school cum shelter means in normal time these are using as school but during disaster theses are shelters.
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 12ounsellor	Not yet done
Members of WMOs included in UDMC	0
Opportunities for	1. The Cyclone Preparedness Program (CPP) is very active in the polder area.

environmental and DRR activities	<p>There are around 630 trained CPP volunteers under 42 units, 4 Union Disaster Management Committees, 4 NGOs are major (Save the Children, Action Aid, Caritas Bangladesh and Dhaka Ahsana Mission) are working together to reduce the risk of disaster. We could make linkages between WMGs and existing platforms for joint collaboration.</p> <ol style="list-style-type: none">2. The variety <i>Babla</i>, <i>Golpata</i>, <i>Raintree</i>, <i>Narikel</i>, <i>Mahogany</i>, <i>Shishu</i> and <i>Chambol</i> are dominating in the area. There is an opportunity to plant these varieties after the repair/rehabilitation of embankments.3. Awareness raising and encouragement of balanced fertilizer use, and the use of alternatives to chemical fertilizers (i.e. organic)
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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 plan a sustainable water management system, 1st consultation meeting for engineering needs assessment for polder 47/4 was held in Baliatali on 16 January, in Dhulasar on 17 January, Mithaganj on 18 January, and in Dalbuganj on 19 January, 2017 in respective UP hall rooms. The chairman, respective UP members, BWDB officials, DAE officials and local stakeholders were present in those meetings. The decisions and list of rehabilitation items which were elicited from the meetings will be validated after the formation of WMOs. Land and Water Use Workshop were arranged in Baliatali UP where UP chairman, DAE representatives, BWDB representatives and local stakeholders discussed about the present cropping system, raised water management related issues and possible solutions to address those issues. BWDB and BGP team members jointly discussed and pointed out the constraints of Blue Gold Program.

Embankment re-sectioning where the damage is severe, embankment retirement, repair/re-construction of structures with gates and re-excavation of major khals for drainage were considered as priority-1 work. Embankment re-sectioning in comparatively less vulnerable places, construction of WM culverts, construction of drain pipes and temporary protective works were considered as priority-2 work².

3.1.1 Summary of Rehabilitation Works

SL.	Name of Work	Units	Quantity	Estimated Total Cost, BDT
Priority 1				
1	Embankment Re-Sectioning	km	22	35,373,908
2	Canal Re-excavation	km	27	3,300,000
3	Repair of Sluices	nos.	23	62,002,160
4	Construction/ Re-construction of Sluice	nos.	02	6,000,000
5	Repair of Inlet	nos.	02	10,00,000
Priority 1 Total=				136,376,078
Priority 2				
6	Drain Pipe	m	800	1,600,000
7	Low cost Band Protection	km	0.5	3,750,000
Priority 2 Total=				5,350,000
Total cost for Rehabilitation Works in Polder 47/4=				141,726,078

Note: The items for rehabilitation works for this polder may be changed after WMA formation and joint field assessment by Zonal TA & BWDB engineers. 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. Priority-3 works are not immediately needed but are desired for further improvement of the water management and environmental conditions in the polder. If DPP allows and fund is available all works will be done.

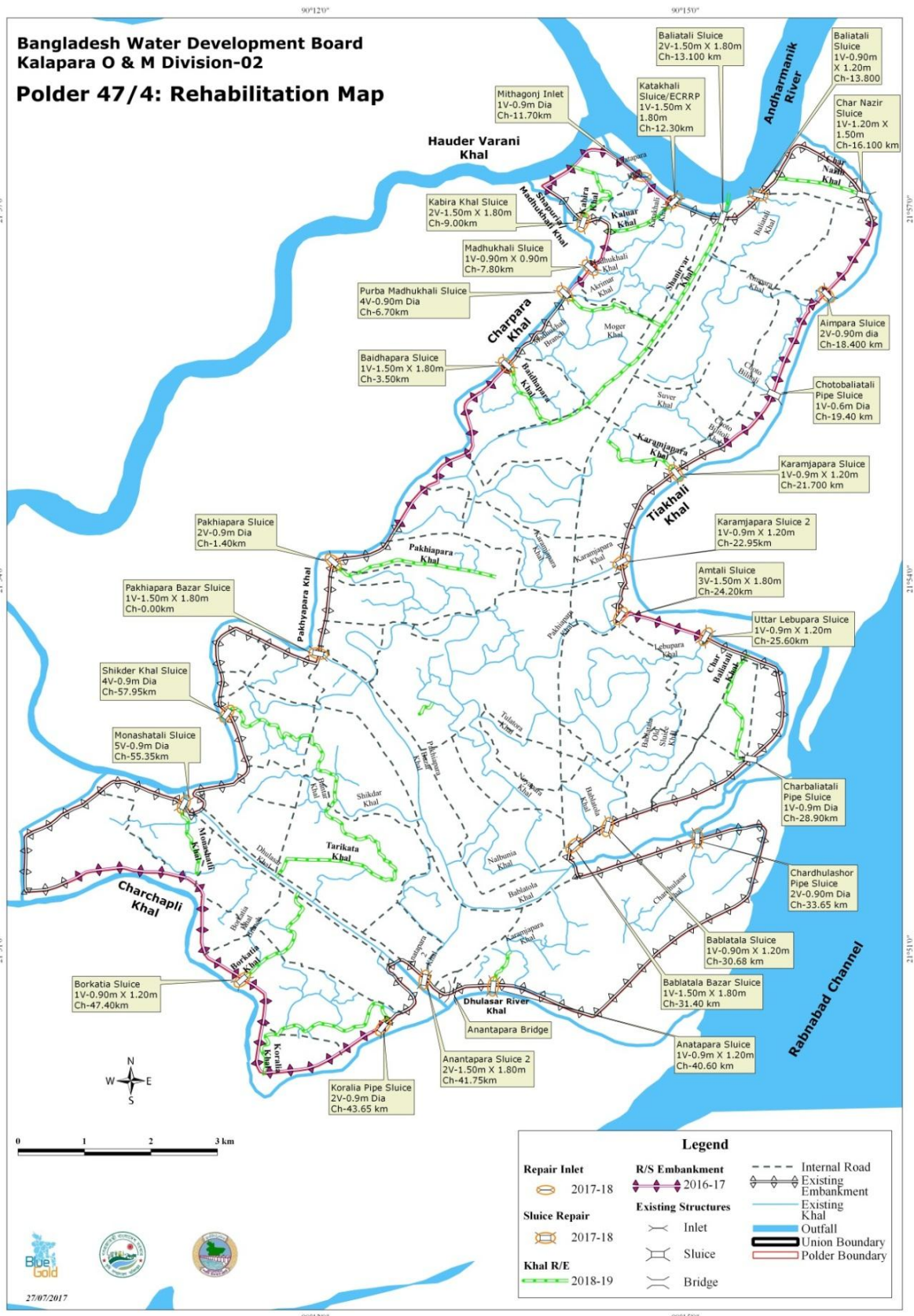


Figure 5: Proposed Rehabilitation Plan

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. 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 WMOs; 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 technical 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 will provide only backstopping support as and when required.

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

No.	Activity	Time Frame	Responsible Actors	People to involve
1.0	Engineering assessment and topographic surveys	2016-2018	BWDB, TA-Engineering team, Socio-Economists and Polder Team	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 Labour Contracting Societies (LCS)	2017-2018	WMG, BWDB, TA- Engineering team, Socio-Economists and Polder Team	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 team, Socio-Economists, Polder Team	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	2017-2020	BWDB, TA-Engineering team, Socio-Economists, Polder Team	WMA Monitoring Committee WMA and WMG Executive Committee
4.1	O&M agreement			
4.2	Implement catchment level water management and O&M plan			
5.0	Internal Polder Water Management	2018-2020	SAAOs (DAE), XOs (BWDB), TA-Socio-Economists, Engineering team, Polder Team	WMA and WMG Executive Committee, UP
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 and CAWM	2018-2020	BWDB, TA-Socio-Economists, Polder Team and Engineering team	WMA and WMG Executive Committee, BWDB, UP
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3.2 Institutional Framework for Participatory Water Management

Activities to strengthen the Institutional Framework for PWM have been planned with multiple 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	Zonal and polder TA team, BWDB and DAE	UP, Potential Leaders
2.0	Conduct UP & Upazila orientation	2016-2018	Zonal and polder TA team, BWDB and DAE	UP, Upazila Administration
3.0	Identify and support existing collective actions (CA) and liaise with their leadership	January 2017 to June 2017	Zonal and polder TA team, BWDB and DAE	UP, Potential Leaders
4.0	Conduct walk-through, mapping with CA leadership & key informants and data collection (household survey)	March 2017 to Sept 2017	Zonal and polder TA team, BWDB and DAE	UP, Potential Leaders
5.0	Form Core Group of interested CA leadership	June 2017 to Dec 2017	Polder TA team, Socio-economists, BWDB	UP, Potential Leaders
6.0	Conduct WLUA workshop with Core Group	May 2017	Polder TA team, Socio-economists, BWDB	WMG and WMA members UP, BWDB, DAE
7.0	Conduct catchment-level planning meetings to define WMG boundaries and collective actions	May 2017	Polder TA team, Socio-economists, BWDB	UP, DAE, Potential Leaders, local stakeholders
8.0	Ad-hoc committee formation and review and update/amend by-laws in accordance with Participatory Water Management Rules 2014	Sep 2017-Oct 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
9.0	Prepare PDP and submit to BWDB	August 2017	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
10.0	Facilitate and expand existing CAs through horizontal learning	January 2017 to June 2010	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
11.0	WMG EC formation and registration	August 2017 to February 2018	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
12.0	Promote and implement new CAs with WMG as identified in the catchment level planning meetings	March 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 experimental learning methods	October 2017 to June 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	January 2018 to June 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
14.0	Facilitate LCS implementation with WMGs	January 2018 to June 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
15.0	Organise CA exchange visits/horizontal learning	January 2018 to June 2020	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
16.0	Facilitate networking and partnerships	August 2017 to Dec 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)	January 2018 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 2018	Zonal and polder TA team, BWDB and DAE	WMG and WMA members UP, BWDB, DAE
19.0	Continue assisting WMGs to improve performance	September 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	January 2018 to April 2018	Zonal and polder TA team	WMG, UP, BWDB, DAE

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	FFS on homestead gardening (vegetables and fruits), Poultry, Pond fish, beef fattening and Nutrition.	2017-2019	DAE, Polder TA team, Master Trainers, Agricultural Expert, FTs,	WMG and WMA members
2.0	a. Women focused FFS on homestead garden , poultry, pond fish, beef fattening, and nutrition; b. Demonstrations / trials on winter vegetables; and poultry, pond fish, beef fattening. c. Field day	2017-2019	DAE, Polder TA team, Master Trainers, Agricultural Expert, FTs	WMG and WMA members
3.0	Activities to improve livestock production: a. Poultry and nutrition FFS	2017-2019	DAE, Polder TA team, Master Trainers, Agricultural Expert, FTs	WMG and WMA members

	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			
4.0	Cropping intensity initiatives	2017-2019	Polder TA team, Master Trainers, Agricultural Experts,	WMG/WMA members
	Business Development			
1.0	Workshop with WMOs to promote CA, Business Planning and private company linkage	2018-2019	BDC, Polder TA team	WMG/WMA
2.0	Linkage Building meeting/Workshop with VC actors	2018-2019	BDC, Polder TA team, RFs	WMG/WMA
3.0	Workshop with GL/RF /FT/LF on agriculture development (FFS with market orientation) business networking and Linkage	2018-2019	BDC, Polder TA team, RFs	WMG/WMA
4.0	Linkage workshop between RF/ CF/LF/FT & Market actors	2018-2019	BDC, Polder TA team, RFs	WMG/WMA/UP
5.0	Actors meeting with WMO for Linkage, Discussion negotiation and Intervention designing	2018-2019	BDC, Polder TA team, RFs	WMG/WMA
6.0	Promote and implement new CAs with WMG as identified in the catchment level planning meetings	2018-2019	BDC, Polder TA team, RFs	BWDB/DAE/UP /DLS/
7.0	Organise CA exchange visits/horizontal learning	2018-2019	BDC, Polder TA team, RFs	BWDB/DAE/UP /DLS
8.0	Input traders capacity building	2018-2019	BDC, Polder TA team, RFs	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	Conduction of Environmental Impact Assessment (EIA) and obtaining Environmental Clearance Certificate (ECC) from DoE	2017-2018	Hired SPs	BWDB, DTL and TA-Env. Expert
2	Environmental compliance monitoring and quarterly reporting to DoE	3 months interval after obtaining ECC	Polder TA team and Env. Expert	CE/Sr. QCE/QCE from TA and XEN/ SDE from BWDB
3	Formulation of Environmental and Social Management Plan (ESMP)	Oct-Nov, 2017	Polder TA team and Env. Expert	TA- ZSEs, Env. Counselors, BWDB

4	Formulation of Community Based Disaster Risk Reduction (CBDRR) plan	Oct-Nov, 2017	Polder TA team and Env. Expert	TA-ZSEs, DRR Counselors
5	Coordination workshop with UDMCs and WMGs	Jan-Feb, 2018	TA-Polder team and Training Team	TA- Env. Expert, ZSEs
6	Recruit WMG's Environment and DRR	July-Dec, 2017	Polder TA team , WMG-EC, hired SPs	TA- Env. Expert, ZSEs
7	Orientation to LCS Leaders, contractors & WMA leaders regarding Env. Safeguards & Conditions of Env. Clearance certificates.	July-Dec, 2017	Polder TA team , Training Team	Counselors, Env. Expert
8	Disaster preparedness and implementation of CBDRR plan	July 2017 to June 2019	BWDB and WMA/WMG, Upazilla, UP	Polder TA team, Engineer team and Env. Expert
9	Training to Env. And DRR Counsellors and UDMCs on Env Safeguard and Dis.Mgt.	July 2017 to June 2019	BWDB and WMA/WMG, Forest Department, UP	Polder TA team, Engineer team and Env. Expert
10	Awareness on disaster preparedness and Watsan	July 2017 to June 2019	Env. And DRR Counselors, WMA and WMG president, BWDB, UP	Polder TA team
11	<p>Awareness raising program</p> <p>a. Discussion on using fertilizer and pesticide use, and reducing indiscriminate fishing practices from the natural wetlands at WMG meeting, FFS & MFS session and FFD</p> <p>b. National and International Day observance related to environment and DRR (i.e. World Environment Day, National Disaster Preparedness Day, International Day for Disaster Reduction etc.)</p>	March 2017 to June 2020	Env. And DRR Counselors, Polder TA team	Env. Expert, Zonal Socio-Economists
12	Integrate ESMP and CBDRR with the WAP, Annual Polder Action Plan and UDMC's DRRAP	2017-2018	TA-Env. Expert, ZSEs, Polder TA team	WMA & WMG executive committee and DRR Counselors.

4. Planning Timeline

**Blue Gold Program, BWDB
Polder Completion Timeline (Overall Activities)**

Polder - 47/4

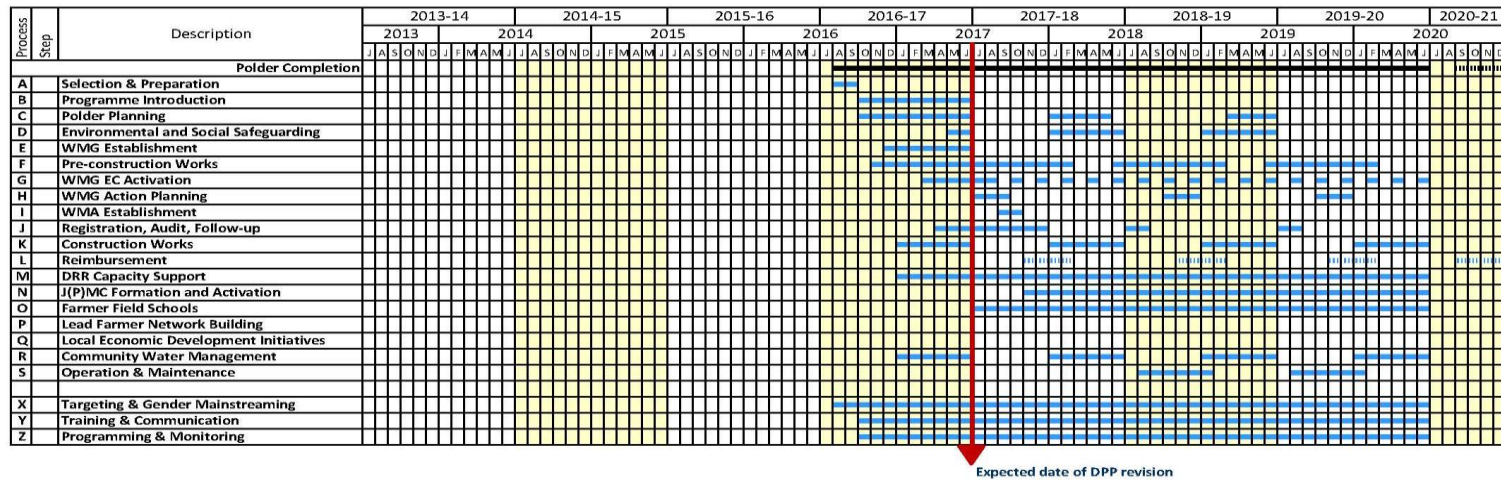


Figure 6: Polder Completion Timeline

5. Polder Budget

The overview of the estimated allocated budget for polder activities in polder 47/4 is presented in Table 6.

Table 6: Polder Budget

S.N	Task Name	Total Amount	
		BDT* ^{x100000}	EUR** ^{x1000}
1.0	Institutional Framework for Participatory Water Management	11.00	12.94
2.0	Main Infrastructure	1417.26	1667.36
3.0	Internal Water Management <i>(Polder-wise budgets are based on an average amount per CAWM-site. In reality budgets will vary per CAWM-site)</i>	25.00	29.41
4.0	Agriculture & Marketing Services <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>	90.00	105.88
5.0	Environmental & Social Management / Disaster Risk Reduction (DRR)	35.00	41.18
6.0	Training and Communication	25.15	29.59
	TOTAL	1603.41	1886.36

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)

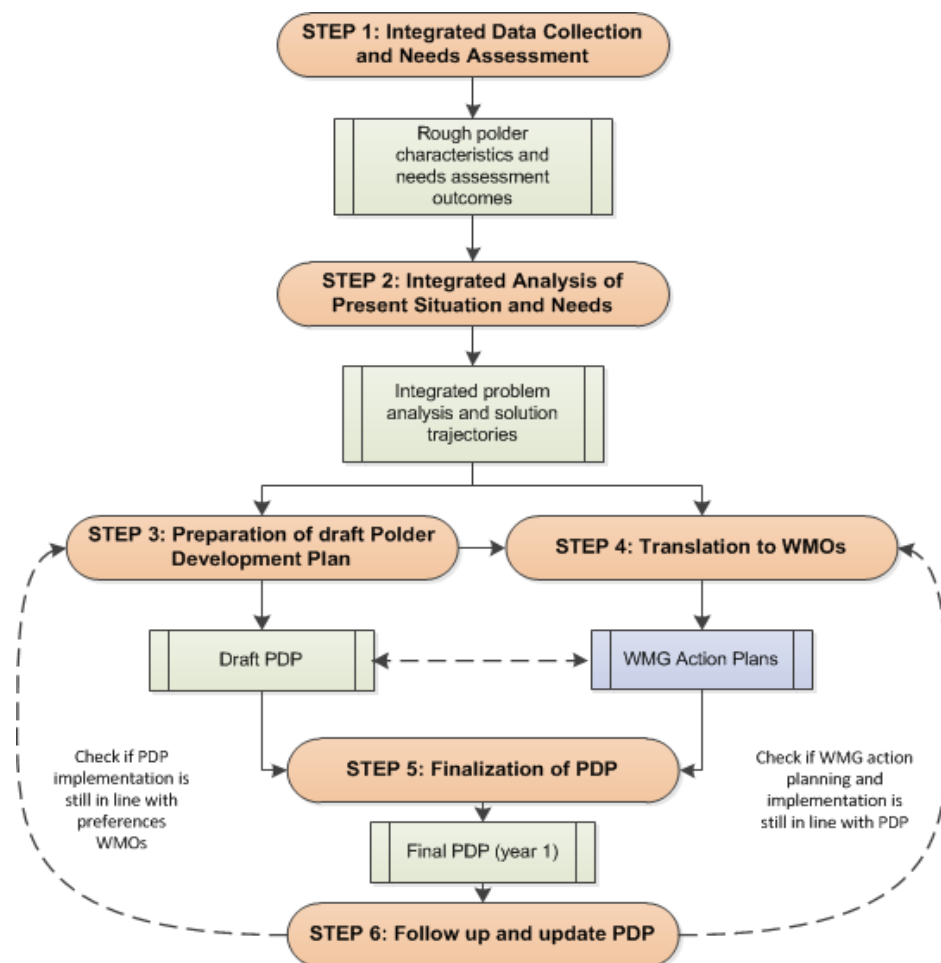


Figure 7: The steps of the PDP Formulation Process

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 potential leaders and UPs. Polder Team and Zonal Experts were actively involved in the process of specific data collection. In the case of polder 47/4, after drafting the PDP it was shared with potential leaders and representatives of 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: Since the WMOs yet not formed, so the draft PDP is being developed through active involvement of potential leaders, UP members and collective action groups. When the WMOs will be formed then the draft PDPs will be presented among them for validation. The Blue Gold staff will support the WMOs 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 potential leaders 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 47/4

Embankment: Total length of the embankment around polder 47/4 is about 59.00 km. The entire embankment is an sea dyke, interior dyke embankment and marginal dyke with a crest width of 4.27m & 2.44, crest level of Sea dyke is 6.10m PWD.C/S slope 1:2 & R/S slope 1:5, interior dyke is 4.88m PWD.C/S slope 1:2 & R/S slope 1:3, marginal dyke is 4.57m PWD.C/S slope 1:2 & R/S slope 1:2.

Sluices: There are 27 Sluices in this polder of which one is closed.
The existing sluices are including:

S.N.	Name of Sluices	Number of Vents	Size, (mxm)	Location, km
1.	Pakhya Para Bazar Sluice	1V	1.50mx1.80m	0.000km
2.	Pakhya Para Sluice	2V	0.90m dia.	1.300km
3.	Baiddopara Sluice	1V	1.50mx1.80m	3.500km
4.	Purba Madhukhali Sluice	4V	0.90m dia.	6.700km
5.	Madhukhali Sluice	1V	0.90mx0.90m	7.800km
6.	Kabirer khal Sluice	2V	1.50mx1.80m	9.000km
7.	Katakhali Sluice	1V	1.50mx1.80m	12.300km
8.	Baliatali Sluice-01	2V	1.50mx1.80m	13.100km
9.	Baliatali Sluice-02	1V	0.90mx1.20m	13.800km
10.	Char Nazir Sluice	1V	1.20mx1.50m	16.100km
11.	Aiumpara Sluice	2V	0.90m dia.	18.400km
12.	Chotobaliatali Pipe Sluice	1V	0.60m dia.	19.400km
13.	Karamja Para Sluice 1	1V	0.90Mx1.20m	21.700km
14.	Karamjapara Sluice 2	1V	0.90Mx1.20m	22.950km
15.	Amtali Sluice	3V	1.80mx1.50m	24.200km
16.	Uttar Lemupara Sluice	1V	0.90Mx1.20m	25.600km
17.	Char Baliatali Pipe Sluice	1V	0.90m dia.	28.900km
18.	Bablatala sluice (new)	1V	0.90mx1.20m	30.700km
19.	Bablatala Bazar sluice	1V	1.50mx1.80m	31.400km
20.	Char Dhulashor Pipe Sluice	2V	0.90m dia.	33.650km
21.	Ananta Para Sluice	1V	0.90mx1.20m	40.600km
22.	Ananta Para Sluice-2	2V	1.50mx1.80m	41.750km
23.	Koralia Pipe Sluice	2V	0.90m dia.	43.650km
24.	Borkatia Sluice	1V	0.90mx1.20m	47.400km
25.	Monashatali Sluice	5V	0.90m dia.	55.350km
26.	Shikder khal Sluice	4V	0.90m dia.	57.950km
27.	Bablatala sluice (old, pipe)	1V	0.90m dia.	47.380km

Drainage Outlets: There are no outlets in this polder.

Irrigation Inlets: Two inlets are Mithaganj inlet and Monashatli inlet

Khals: There are about 49 recognizable khals with branches and having a total length of above 190.00 km.