



**Bangladesh Water Development Board (BWDB)**



**Kingdom of the Netherlands**

**Embassy of the Kingdom of the Netherlands (EKN), Dhaka, Bangladesh**



**Department of Agricultural Extension (DAE)**



**Polder Development Plan (PDP) – DRAFT**

**Polder 27/1**

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# Issue and revision record

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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

<b>Arotdar</b>	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.
<b>Beel</b>	Naturally depressed land inundated under water for at least one season
<b>Bepari</b>	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.
<b>BKash</b>	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.
<b>Business service</b>	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.
<b>Capture Fisheries</b>	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.
<b>Climate Change</b>	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.
<b>Cross-cutting issues</b>	Issues that affect all areas of concern within their context.
<b>Culture Fisheries</b>	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.
<b>Disaster Risk Reduction (DRR)</b>	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.
<b>Embankment</b>	An embankment is a high earthen dike surrounding an area in order to protect it from external floods and salinity.
<b>Enabling environment</b>	Environment favourable to working, participating and demonstrating potentials.

<b>Farmers Field School (FFS)</b>	FFS is a participatory group based learning approach where farmers can learn by doing and share their experiences.
<b>Governance</b>	Description of the dynamic distribution of power, learning, and benefits among participants in a value chain.
<b>Inlet</b>	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.
<b>Landless/Labour Contracting Societies</b>	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.
<b>Local Governmental Institutions (LGIs)</b>	The institutions formulated under different Acts/Ordinances to run the different administrative unites of Local Government system by the Government.
<b>Kharif-I</b>	Pre-monsoon season, from March to half July.
<b>Kharif-II</b>	Monsoon and post-monsoon season, from July to October.
<b>Khal</b>	Excavated or natural routes across any land area for draining out excess water and flushing in required water.
<b>Market Actor</b>	Smallholder, input supplier and output market players directly participating the value chain.
<b>Market development based</b>	Activities that try to make the interaction between demand and supply more effective.
<b>Market transaction</b>	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).
<b>Market</b>	A set of arrangements by which buyers and sellers are in contact to exchange goods or services—the interaction of demand and supply.
<b>Needs Assessment</b>	It is an assessment of the needs and priorities of local population in a polder.
<b>Piker</b>	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.
<b>Polder</b>	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.
<b>Rabi</b>	Dry season, from November to March.
<b>Standing Committees of UP</b>	Standing Committee means the Standing Committee formulated under the Local Government (Union Parishad) Act, 2009.

<b>Sluice</b>	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.
<b>Union Parishad (UP)</b>	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.
<b>Value Chain</b>	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.
<b>Water Management Group Action Plan (WAP)</b>	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.
<b>Ward</b>	Ward means the Ward of Union Parishad. Each Union Parishad consists of 9 Wards.
<b>Water Management Organisations (WMO)</b>	It is a common name for all organizations formed for the purpose of water management in a polder, namely WMG, WMA and WMF.
<b>Water Management Group (WMG)</b>	Local people organized within a hydrological unit or at village level to manage water resources are collectively called Water Management Group.
<b>Water Management Association (WMA)</b>	It is a higher tier of water management organization formed by representatives of WMGs.
<b>Water Management Committee (WMC)</b>	It is a committee to initiate and coordinate operation and maintenance activities in a catchment area. It is formed by representatives of WMGs.
<b>Water Management Federation (WMF)</b>	This is the highest tier of water management organization in the polder. It is formed by representatives of all WMAs.
<b>Zonal level</b>	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 institutions<sup>1</sup>.

### ***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.

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<sup>1</sup> 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 27/1 is managed by the Bangladesh Water Development Board (BWDB) and was constructed during 1963-65 and later was rehabilitated under the KJDRP project from 1996 to 2002. It is located mostly in Dumuria, Rangpur and Gutudia unions of Dumuria upazila under Khulna district. It is surrounded by Shalta river in its South, upper Shoilmari river in the East and Vodra river in the Western 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.

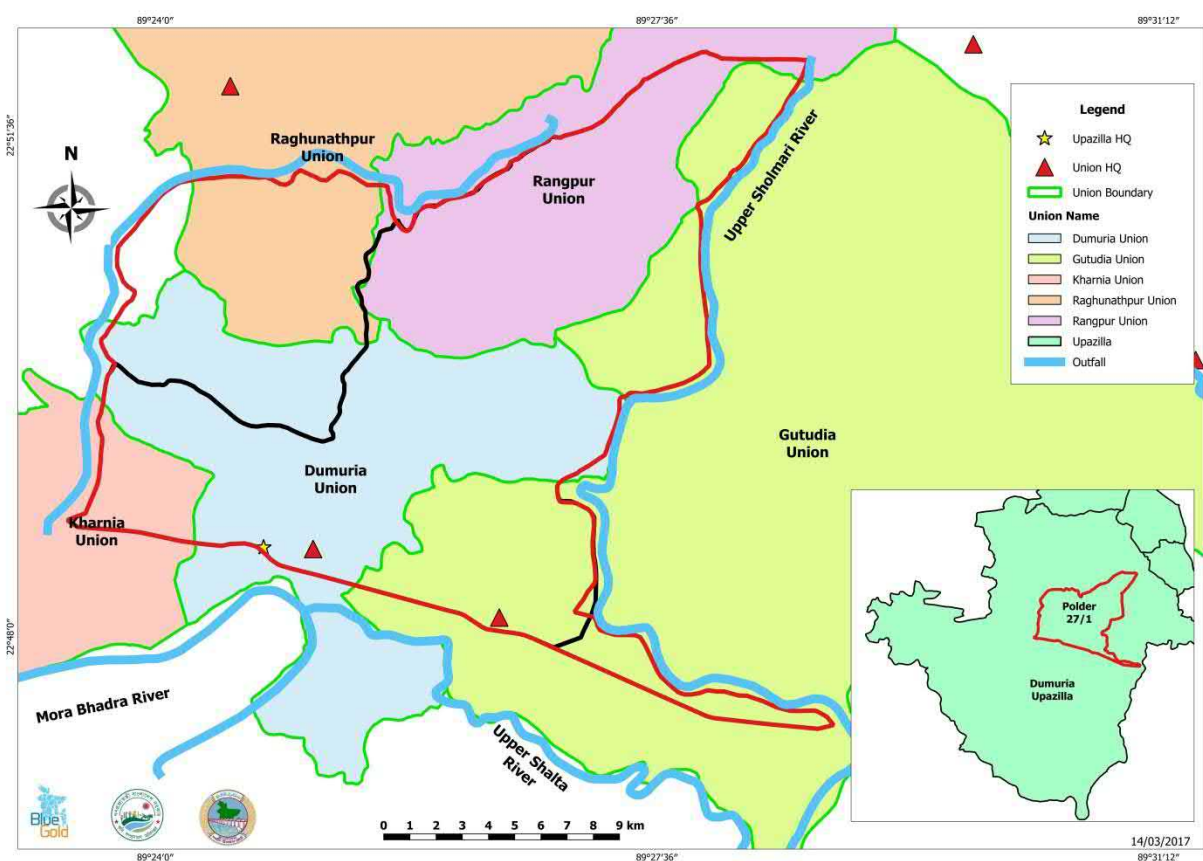


Figure 1: Location of Polder 27/1 in Dumuria Upazila under Khulna District

Table 1: Main Physical and Demographic Characteristics of polder 27/1

Characteristics	
Included Upazila(s)	Dumuria
Included Unions	Partial part of Dumuria, Rangpur, Ragunathpur, Rudaghara, Gutudia and Khornia
Polder boundary (in km)	30 km
Total number of Mouzas	15

<b>Total polder area (in ha)</b>	3765		
<b>Total number of households in the polder</b>	8212		
<b>Total number of catchments (existing)</b>	05		
<b>Total cultivable land (in ha)</b>	3000	High land: 05% Medium-high land: 20%	Low land: 75%
<b>Population</b>	36085		
<b>Literacy rate</b>	70%	Male: 55%	Female: 45%
<b>Major occupations</b>	Agriculture (60%)	Agricultural labour (20%)	Business (10%) and Others (10%)
<b>Economic condition</b>	Rich: 10%	Middle class: 70%	Poor: 20%
<b>Status of seasonal labour migration</b>	In Robi season, most of the lands are remain fallow it means there are no agricultural activities and as a result no need to use the agricultural labor. After harvesting T-Aman rice and before going to cultivate sesame the agricultural labor are in the workless. In this time (December to February) farmers migrate to another places where need agricultural labor. Approximately 10-12% farmers go to nearest Dumuria, Jessore and Gopalganj districts. The activities they engage to sell labor in boro rice and winter vegetable cultivation, rickshaw-pulling, and some are engage small business. Agriculture, brick field works and day labour are the main profession of polder inhabitants.		
<b>Status of internal road communication</b>	High way 5.00 km, internal bituminous road 22 km, brick soling 41 km and earthen road 32 km. Basically this polder is near Khulna-Satkhira high way and inhabitants are using van, rickshaw and easybike as major transport. Internal road communication facilities fully depend on embankment road and internal roads which are connected with the embankment road.		

## 2.2 Water Resource Management and Infrastructure

Main features of the water resource management and infrastructure in polder 27/1 are highlighted in Table 2. Figure 2 shows the locations of existing water management infrastructures in polder 27/1. Further details are given in Appendix 2.

**Table 2: Main Features of Water Resource Management and Infrastructures of polder 27/1**

Features			
<b>Length of embankment (in km)</b>	30.42 km		
<b>No. of drainage/flushing sluices</b>	08 (active 5 and inactive 3)	Good condition: 00	Poor condition: 05
<b>No. of inlets</b>	00	Good condition: N/A	Poor condition: N/A
<b>No. of (drainage) outlets</b>	00	Good condition: N/A	Poor condition: N/A
<b>No of major khals</b>	Approximately 19 (main khals are 05 and secondary khals are 14)		
<b>Length of major khals (in km)</b>	About 73 km (main & secondary)		
<b>Main outfall rivers, major drainage khals and sluices</b>	<p><b>Outfall rivers:</b> Upper Sholmari River on the east, Upper Salta River on the south (through polder 27/2) and Hamkura River on west (dead);</p> <p><b>Drainage khals:</b> Kailshkhali Sluice Khal, Ghonerdara Khal, Khorla Khal, Guatola Khal, Taltola Khal, Magurkhali Khal, Bashtola Khal, Madhukhali Khal, Ali Khar Berer Khal;</p> <p><b>Sluices:</b> Mirzapur Sluice, Khorla Sluice, Magurkhali Sluice,</p>		

	Kailashkhali Sluice, Jeelerdanga Sluice.
<b>Situation of tidal and river flooding</b>	There is no tidal flooding in this polder. Usual depth of inundation from 0.60 m to 1.50 m in the monsoon. Duration of inundation is about 3 to 6 months.
<b>Locations with water logging and siltation.</b>	Hamkura beel (Khalshi, Shahapur and Madhabkathi Mouzas), Mirzapur Mouza (part) and Rangpur Mouza (part).
<b>Most river erosion prone area</b>	No such area
<b>Other relevant water issues</b>	Major khals are blocked by cross dams. Hamkura river is fully silted that totally blocks the drainage from the western part of the polder. Two sluices, Khajura and Boloikhali, on this river are totally blocked and inactive. Water flow from Beel Dakatia and Thukra areas come down through Ghonerdara khal and inundates this polder, specially Rangpur Mouza, because of damaged internal dikes on both side of this khal.
<b>Key challenges in effective water management</b>	Long term leasing of khals, cross dams across khals, poorly functioning sluice gates and outfall river siltation (Hamkura river)
<b>Challenges in planning construction/rehabilitation of water management infrastructures within polder</b>	<ol style="list-style-type: none"> <li>1. Limited program scope and budget but huge local demand, specially for re-excavation of khals;</li> <li>2. Disagreement from local influential;</li> <li>3. Culture fish by local influential.</li> </ol>
<b>Current internal polder water management practices</b>	Currently there are no water management initiatives. The respective UP Chairpersons usually control the operation of the sluices and the local influentials dominate use of the khals.
<b>Overall condition of internal polder water management</b>	Not very satisfactory.
<b>Opportunities for internal polder water management</b>	Local people and UPs are supportive and communication is good. With these opportunities along with formation and strengthening of WMOs and rehabilitation of water management infrastructures, polder water management can be significantly improved.

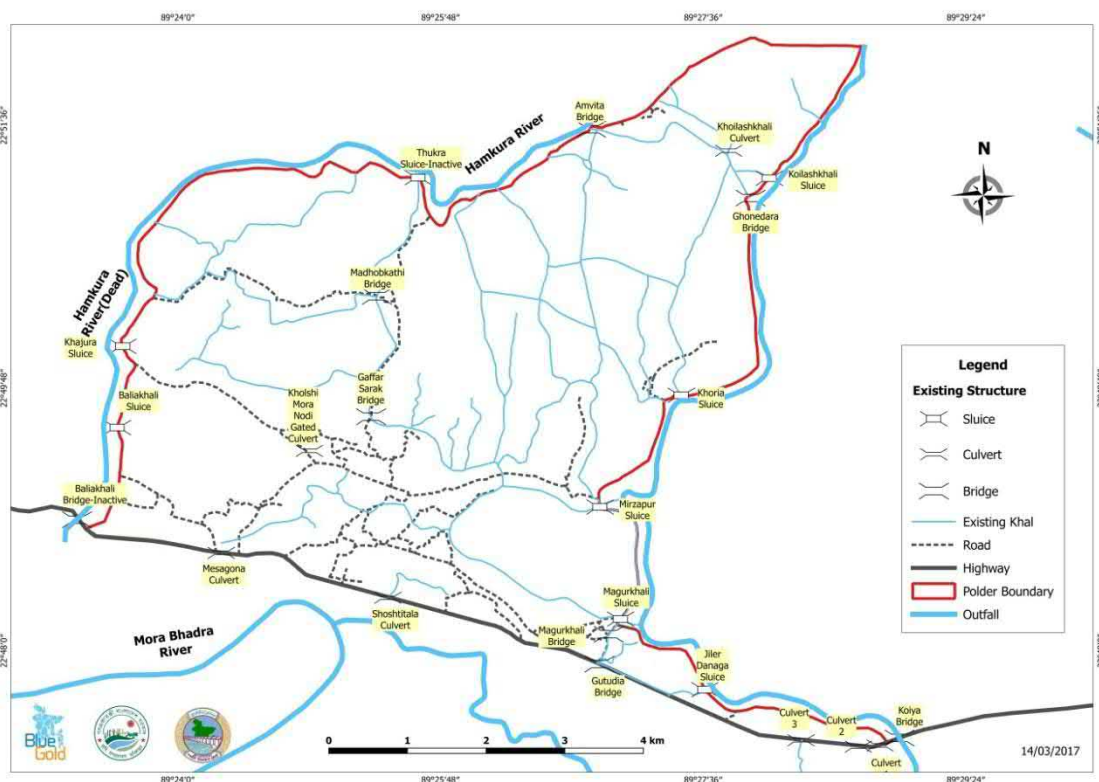


Figure 2: Map of Polder 27/1 showing the existing Water Management Infrastructure



### 2.3 Institutional Framework for Participatory Water Management

The main institutional actors in polder 27/1 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 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 27/1**

Characteristic			
<b>Number of WMGs</b>	14	Registered: 00	Non-registered: 14
<b>Members of WMGs</b>	350	Female: 56	Male: 294
<b>HHs being part of WMGs</b>	300		
<b>Number of WMAs</b>	01	Registered:00	Non-registered: 01
<b>Female representation in WMGs</b>	16%		
<b>Total deposited fund (BDT)</b>	60,000		
<b>Total savings of WMGs (BDT)</b>	70,000		
<b>Total number of WMGs with O&amp;M fund</b>	Not any fund		
<b>Names of projects and organisations with similar / related activities</b>	There is no organizations currently working in polder 27/1 with similar activities but there are many NGOs operating microfinance (i.e. CSS, Asha, TMSS, DSK, Jagorono Chakra Foundation, Grameen Bank etc.), working on agricultural sector development (i.e. BRAC) and WatSan (i.e. Karitas, Uttaran etc.) programs.		
<b>Existing WMOs linkages with other stakeholders</b>	Generally weak linkage with UPs, however linkages with other service providers like DAE, BWDB, LGED, NGOs and private sector actors should still be further strengthened.		
<b>Number of WMGs member including in UP standing committee</b>	0		
<b>O&amp;M agreement signed with BWDB</b>	Not yet signed		
<b>Current participation of WMOs in O&amp;M</b>	Not at all.		
<b>Existing conflicts on water management</b>	There is little conflict between gher owners and agriculture farmers on cross dam issues.		
<b>Key challenges in strengthening PWM</b>	<ol style="list-style-type: none"> <li>1. Internal conflict with gher owners and other farmers;</li> <li>2. Cross dam remove;</li> <li>3. Leaseing khas lands; and</li> <li>4. Some NGOs have strategy which differs and sometimes even contradicts with Blue Gold Program (e.g. providing free input support which controlling by elites).</li> </ol>		
<b>Key challenges in relation to women participation</b>	No challenges here in relation to women participation but still some women's those who are out of WMOs still cannot have their much mobility access.		
<b>Key opportunities in PWM</b>	<ol style="list-style-type: none"> <li>1. SaFal program is recently over but their community groups are still exists which could be a platform for Blue Gold Program; and</li> <li>2. Women farmers are very active and interested to work with WMOs</li> </ol>		

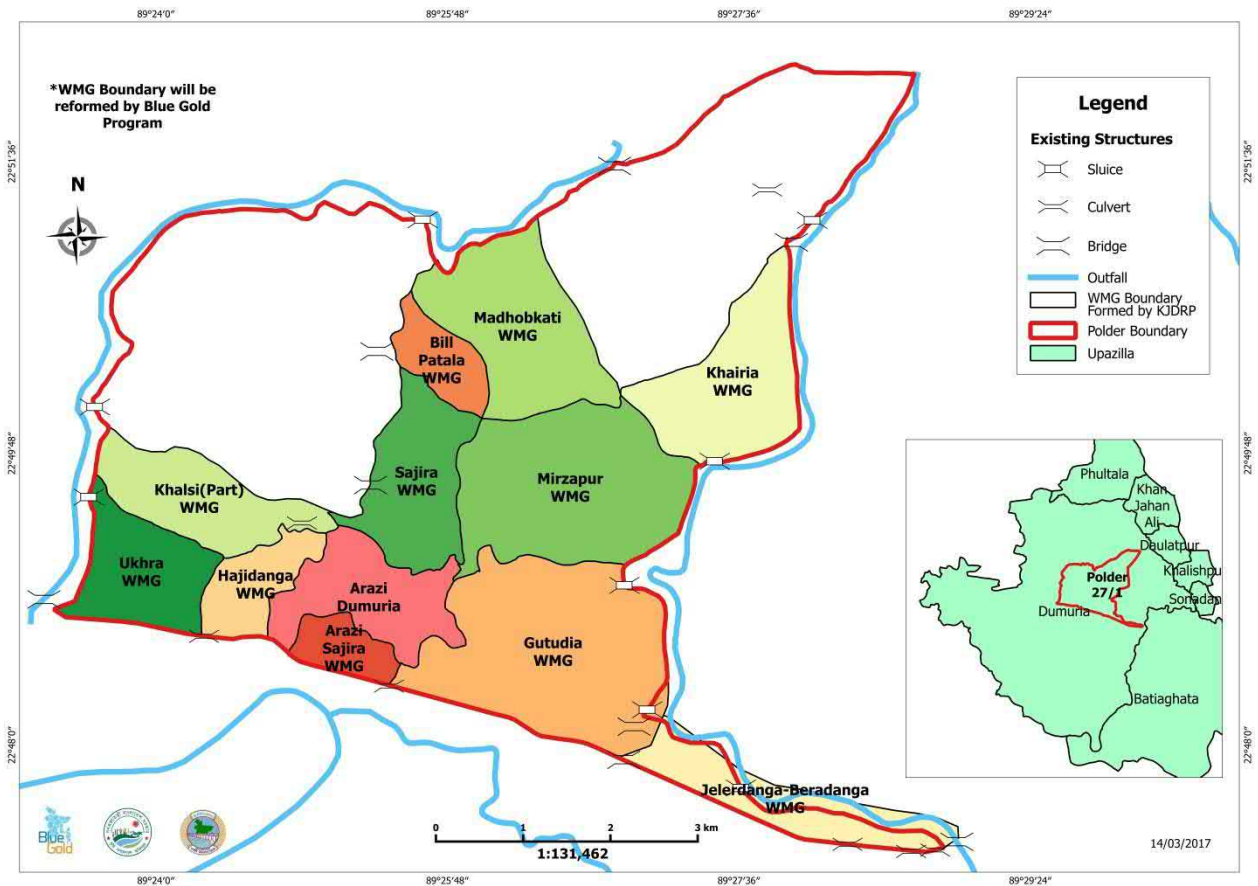


Figure 3: Name of WMG and WMA areas in Polder 27/1

### 2.4 Agricultural and Marketing Services

In polder 27/1, 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 27/1 are shown in Figure 4.

Table 4: Main characteristics of Agricultural and Marketing Services in polder 27/1

Characteristic			
<b>Main crops (top three)</b>	1. Local T.Aman	2. Sesame	3. Vegetable
<b>Current most common cropping pattern</b>	Fallow-Fallow-T aman (60%) Boro-Fallow-T-Aman/Fish (10%) Boro-Fish-Fish (7%) Boro-Fallow-Fallow (6%) Vegetable-Fallow-T-Aman (5%) Spices-Vegetable- Vegetable (5%) Vegetable- Vegetable- Vegetable (4%)		
<b>Current cropping intensity</b>	205% Total area (ha) 3765, Total crop area (ha) 1804, Single croup (ha) 700, Double crop (ha) 100, Triple crop (ha) 104, Fallow land (ha) 1225		
<b>Main vegetables</b>	Polder 27/1 is the vegetables growing areas.Tomato, Cauliflower, Cabbage, Turnip, Radish, Red amaranth, Brinjal, Country bean, Bottle gourd, Sweet		

	Gourd,Ladies finger, Bitter gourd, snack gourd, Long yard bean, Pointed gourd ,Cucumber, Indian Spinach are the main vegetables .
<b>Main fruits</b>	Main fruits are cultivated in polder 27/1 areas, are Jujube, Mango, Guava, Coconut, Jackfruit, Betel nut, Lemon and Banana.
<b>Available agricultural machinery</b>	Polder 27/1 has significant numbers of agril machineries. Especially farmers used power tiller, thresher machine, irrigation pump, spray machine etc. In this polder there is no agricultural machineries under the management of WMG, but most of the large farmers have their own machineries and some entrepreneurs have been providing tillage services by rented power tiller. There are 505 deep tubewell, semi deep tubewell 1305, power pump 50, power tiller 40 and they have 38 low pump.
<b>Present irrigation practices</b>	Polder 27/1 are focused as vegetable producing zone and crop productions are fully depends on irrigation systems .Approximately 50-55% lands come under the irrigation facilities specially to cultivate winter vegetable, Boro rice, and homestead vegetable. But Boro rice is cultivated by used the Gher water. Mainly surface water (cannel, Gher and pond water) and deep water is used for irrigation. Approximately 60 LLP (Low Lift Pump), some AFP (axial flow pump) and manmade Agril equipment use for properly managed the irrigation facilities. Here irrigated land 70%, none irrigated land 20%, major crop under irrigation 10%, irrigation facilaties 20% and they use shallow tubwell as irrigation machine.
<b>Availability of inputs</b>	Seed, fertilizer, pesticide, farm machineries, irrigation facilities and technology & information is the main input of agriculture sector. Most of the input company and private sector have been working in this upazilla and also they are established close connection with farmers through the dealership system. Dumurea is fully developed and recognised on input market system where dealers, retailer and companies have been provided their input related service to the farmers and here also access our polder dwellers. But in polder area 2 fertilizer dealer and 7 retailers' also 1 seed dealers and approximately 12 plus seed and pesticide retailers are available for providing input related services.
<b>Current knowledge on proper input use</b>	Some of farmers have lack of knowledge to identifying quality seed, fertilizer and pesticide. In rice production, farmers have not follows the actual fertilizer doze in some cases they used only Uera but not used others micro nutrient fertilizer like (DAP, TSP, MoP, Zypsum) beside they did not follows the actual apply methods and doze. In case of sesame, farmers did not use the fertilizer. Beside farmer always used high number of seeding (8-10 plants) for T-Aman rice production.
<b>Important business trend in crop production</b>	Ghutudia gramer hat and Dumuria hat is now famous for selling agricultural products especially for vegetable and fish. Areas already have focused as vegetable producing zone and farmers have been cultivated vegetable as commercial purpose and took it as new business. Moreover, high market demand is making the farmers interested in producing market-based product. Beside well developed road communication also helped to increase the new business trend on vegetable production.
<b>Key challenges in agriculture</b>	<ol style="list-style-type: none"> <li>1. Water logging;</li> <li>2. In availability of quality seed;</li> <li>3. There are pest and rodents problems in case of field crops; and</li> <li>4. Poor drainage facilities</li> </ol>
<b>Percentage of households owning livestock</b>	Cattle :80-85 % Goats : 40-50 % Poultry: 90-95%
<b>Availability of inputs for livestock</b>	Inputs like poultry feed and cattle feed are available with the local agents/traders. Farmers also collected feed and the chicks from Dumuria.
<b>Important business</b>	There are some local business men in the polder who buy local poultry, goats

<b>trend in livestock</b>	and cattle from the farmers directly. They visited home to home and procure from the farmers' house. The farmers sold eggs and broiler birds to the local agents and also in the local hat/market.
<b>Key challenges in livestock</b>	<ol style="list-style-type: none"> <li>1. Non availability of improved breed for cattle;</li> <li>2. No artificial insemination centre;</li> <li>3. Lack of vaccines and medicines;</li> <li>4. No fodder cultivation; and</li> <li>5. Poor housing and management of livestock.</li> </ol>
<b>Percentage of households involved in fish culture</b>	70 – 75 % of the households involved in fish culture.
<b>Types of fish</b>	There are different kinds of fish cultivated in the polder, i.e. Rui, Katla, Mregel, Tilapia, Thaiputi, Grass carp, Silver carp, Prawns, Golda etc.
<b>Availability of inputs</b>	Inputs of fisheries like fingerlings are not fully available in the polder areas. Some <i>patilwala</i> (mobile fingerling seller) sell fingerlings that not sufficient to meet the demand. There is no hatchery in the area. Fish feed is available in the local market.
<b>Important business trend in fisheries</b>	The fish farmers sell their fishes and prawns, golda etc in Dumuria and Gollamari. Some traders also procure fishes from the farmer's pond directly by visiting the areas. The production of fishers are increasing day by day, as a result the market establishment is important.
<b>Key challenges in fisheries</b>	<ol style="list-style-type: none"> <li>1. Quality fingerlings are not available;</li> <li>2. Low fish production per hectare;</li> <li>3. Sometimes price of fingerlings is higher;</li> <li>4. Price of fish is also sometimes very less; and</li> <li>5. Disease of fish</li> </ol>
<b>Existing extension services</b>	There is no extension worker from the Fisheries department in the polder area.
<b>Name and location of markets</b>	Basically two main markets inside the polder, one is Ghutudia gramer hat and another is Dumuria bazar. But in some cases people goes to Koiya bazar and Khornia bazar.
<b>Products provided</b>	Different field crops like Rice, Sesame, Mung bean, Sweet gourd, and homestead vegetable and fruit like Bottle gourd, Country bean, Dram stick, Banana, Papaya, Mango and fish (capture fish, culture fish, shrimp and prawn) are the main marketable products.
<b>Surplus destination of products outside polder</b>	T-Aman rice is the main agricultural products of polder 27/1 and after family consumption farmers sell the surplus rice through Dumuria bazar and this product directly goes to Khulna or outside the polder area. Sesame is the second largest crop and farmers produced it as cash crop so that 100% products might sell.
<b>Main value chain actors</b>	Sesame, T-Aman rice and local poultry are the selected value chain products for polder dweller. Approximately 26 input traders (feed, medicine, seed pesticide and agri machineries), 15-20 service providers (RFs, community poultry worker, vaccinator), 8 local piker, and some egg collector 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, three markets (Koiya bazar, Dumuria and Hashem Ali Arot) have been providing roles & regulation related enabling support services.
<b>Key challenges in marketing</b>	<ol style="list-style-type: none"> <li>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;</li> <li>2. Farmers are prohibited to use their own seed (local variety rice seed, brown sesame seed) and it is one of the major challenges to increase</li> </ol>

production; and  
 3. Lack of knowledge on improved production technology (i.e. seed rate, fertilizer use) and post harvest technologies (i.e. timely harvest, drying).

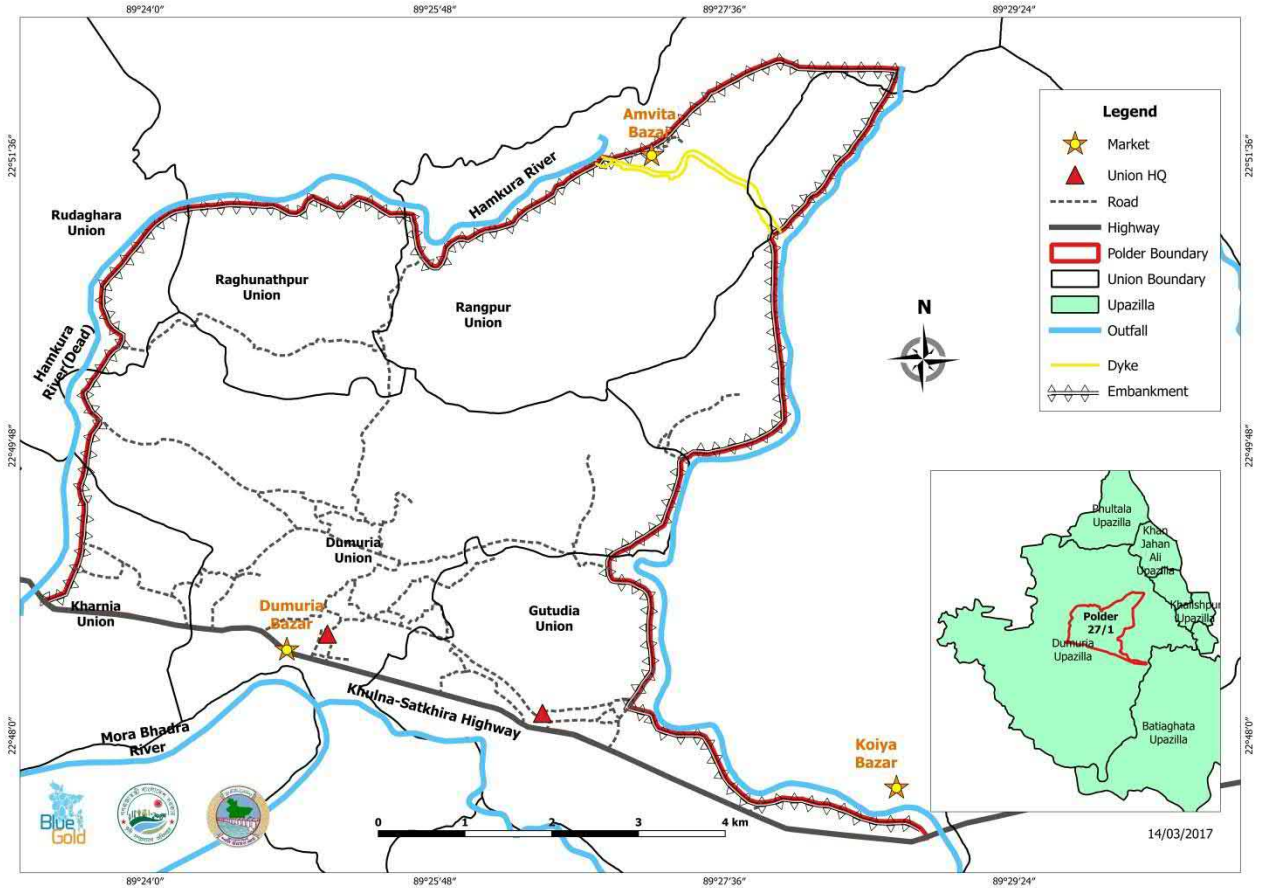


Figure 4: Markets and Union headquarters in Polder 27/1

## 2.5 Environmental Sustainability and Disaster Risk Reduction

**Table 5: Main environmental and DRR characteristics of polder 27/1**

<b>Characteristics</b>	
<b>Existing environmental problems</b>	<ol style="list-style-type: none"> <li>1. Hamkura beel which located at the south of Thukra bridge and Bogar khor beel which located near to Magurkhali sluice are very much prone to water logging. It affects the people for 3-6 months usually start from July and end in December. The T-Aman rice and seed bed for Boro rice do affect by the water logging. As reported by the members of WMOs the maximum khals are blocked by establishing fishing trap (patha) which causing siltation, problem of drainage congestion and water hyacinth congestion;</li> <li>2. Construction of cross dam on Kalamer khal (at the point of Hazidanga) and Doger khal (at the point of Mirjapur village) is the greatest barrier for fish migration;</li> <li>3. This area is not experienced with severe cyclone and salinity intrusion. Farmers practice fresh water fish culture and usually stock Golda, Telapia, Rui, Catla, Mrigel and other carp species. As reported by the local fishers they stopped entering saline water 10-15 years back; and</li> <li>4. As the polder is near the highway and no large river is around so there are little possibilities to happen large scale damage.</li> </ol>
<b>Common hazards</b>	Water logging comes first while heavy rainfall is second
<b>Cyclone shelters</b>	01 (school cum cyclone shelter)
<b>Obtained environmental clearance certificate (ECC)</b>	Not yet conducted the EIA
<b>Formulated environmental and social management plan (ESMP)</b>	Not yet done
<b>Formulated community based disaster risk reduction (CBDRR) plan</b>	Not yet done
<b>Recruited WMG environment and DRR Counselor</b>	Not yet done
<b>Members of WMOs included in UDMC</b>	0
<b>Opportunities for environmental and DRR activities</b>	<ol style="list-style-type: none"> <li>1. The community groups have been formed by SaFal program, existing WMGs and WMAs have been formed by KJDRP, IFMC Club and CGIS groups and UDMCs are the key platform for environment and DRR capacity building, increasing mass awareness and building resilience;</li> <li>2. Caritas and Shushilan have been working on DRR and Climate Change. So we might make joint collaboration with them;</li> <li>3. There are many people who are involved voluntarily to reduce the risks of water logging. As we came to know that they have taken number of initiatives to cleaning the water hyacinth from the khals and remove the barriers/dams/pathas from the rivers and khals. We could mobilize them for environment and DRR activities.</li> </ol>

## 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

The rehabilitation needs in the polder were identified and prioritized through consultation meetings and discussions with the Union Parishads and the local representatives on 16 and 20 November 2016. Summary of the identified rehabilitation works with tentative quantity and cost estimates are given in the table below. After thorough discussion and arguments with the local stakeholders the following infrastructures were identified and validated for inclusion for rehabilitation. Khal re-excavation for drainage purpose and the repair of existing structures, rehabilitation of internal/interior dyke were considered as priority-1 work. Re-excavation of secondary khals for drainage was considered as priority-2, and repairing of embankment, re-excavation of some minor drainage khals and construction of drainage pipes were considered as priority-3 works<sup>2</sup>.

#### 3.1.1 Summary of Rehabilitation Works

SL.	Name of Work	Units	Quantity	Estimated Total Cost, BDT
<b>Priority 1</b>				
1.0	Interior/ Internal Dike (both side of Ghonerdara khal)	km	6.00	2,742,900
2.0	Khal Re-excavation (Khoria, Magur Khali, Shiarghata, Shostitola, Ghonerdara)	km	17.50	24,500,000
3.0	Repair of Sluices	nos	5	17,500,000
<b>Priority 1 Total=</b>				<b>44,742,900</b>
<b>Priority 2</b>				
4.0	Khal Re-excavation (Khalshi Mora Nadi)	km	4.00	5,600,000
<b>Priority 2 Total=</b>				<b>5,600,000</b>
<b>Priority 3</b>				
5.0	Embankment Re-sectioning (various reaches in Rangpur and Dumuria UP)	km	4.00	5,200,000
6.0	Khal Re-excavation (Shiarghata Branch 1&2, Bashtola)	km	7.50	10,500,000
7.0	Provision of pipes	m	400	800,000
<b>Priority 3 Total=</b>				<b>16,500,000</b>
<b>Total cost for Rehabilitation Works in Polder 27/1=</b>				<b>66,842,900</b>

*Note: The items and quantities for rehabilitation works for this polder may change after WMO formation and field assesment by Zonal TA and BWDB engineers.*

**A map showing proposed rehabilitation plan is given in Figure 5**

<sup>2</sup> 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.

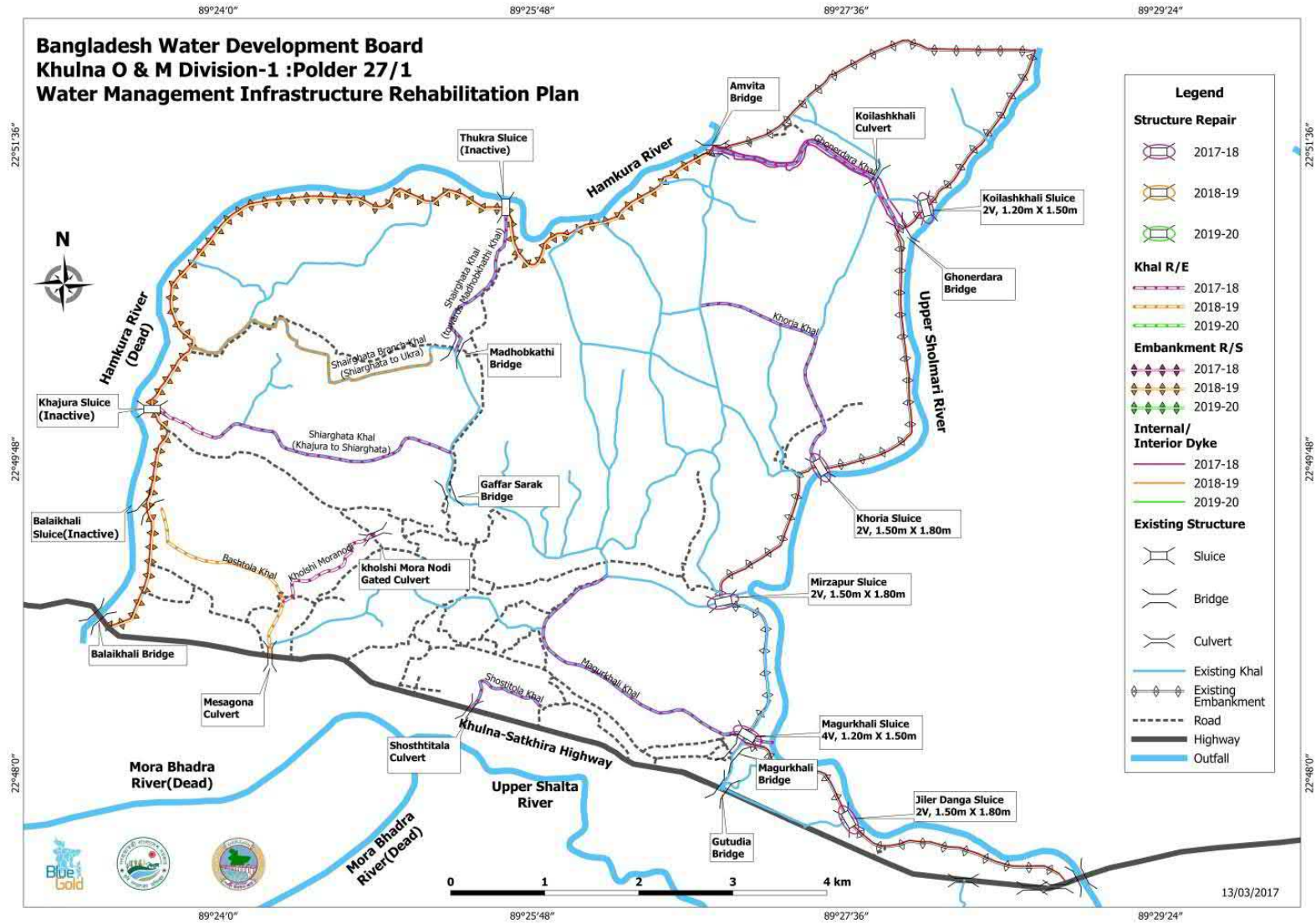


Figure 5: Proposed Rehabilitation Plan



### 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, 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 will be 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 the second year, there will only be TA support for monitoring of O&M and internal polder water management, and 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	BWDB, TA-Engineering Staff, Socio-Economists, CDFs, WMA	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	After main WRM infrastructure	SAAOs (DAE), XOs (BWDB), TA-Socio-Economists,	WMA and WMG Executive Committee
5.1	Identify WMGs interested to work along Community Agricultural Water			

	Management (CAWM) model.	is implemented	Engineering staff COs and PFs	
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	November 2016	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 implementation with WMGs	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 2010	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

### 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
<b>Agricultural Services</b>				
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; and 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;	2017-2019	DAE, TA-CDFs, Master Trainers,	WMG and WMA members

	<ul style="list-style-type: none"> <li>b. Livestock vaccine cold chain at WMG/WMA level;</li> <li>c. Community Livestock Worker training;</li> <li>d. Community Poultry Worker Training; and</li> <li>e. Field day on livestock activities</li> </ul>		Agricultural Expert, FTs	
<b>Business Development</b>				
1.0	Workshop with WMOs to promote CA, Business Planning and private company linkage	July-Aug 17	BDC, CDFs	WMG/WMA/DAE/DLS
2.0	Linkage Building meeting/Workshop with VC actors	July-Aug 17,18,19	BDC, CDFs, RFs	WMG/WMA/DAE/DLS
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/DAE/DLS
4.0	Linkage workshop between RF/CF/LF/FT & Market actors	June 17, 18,19	BDC, CDFs, RFs	WMG/WMA/DAE/DLS/PS
5.0	Actors meeting with WMO for Linkage, Discussion negotiation and Intervention designing	Nov-17,18,19	BDC, CDFs, RFs	WMG/WMA
6.0	Promote and implement new CAs with WMG as identified in the catchment level planning meetings	2017-2019	BDC, CDFs, RFs	BWDB/DAE/UP/DLS
7.0	Organise CA exchange visits/horizontal learning	Apr 17-Mar 20	BDC, CDFs, RFs	BWDB/DAE/UP/DLS
8.0	Input traders capacity building	Nov17	BDC, CDFs, 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
1.0	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)	2017-2018	TA-Env. Expert, Polder Team	Socio-Economists, TA-Engineer Team,

	plan			
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 - 27/1

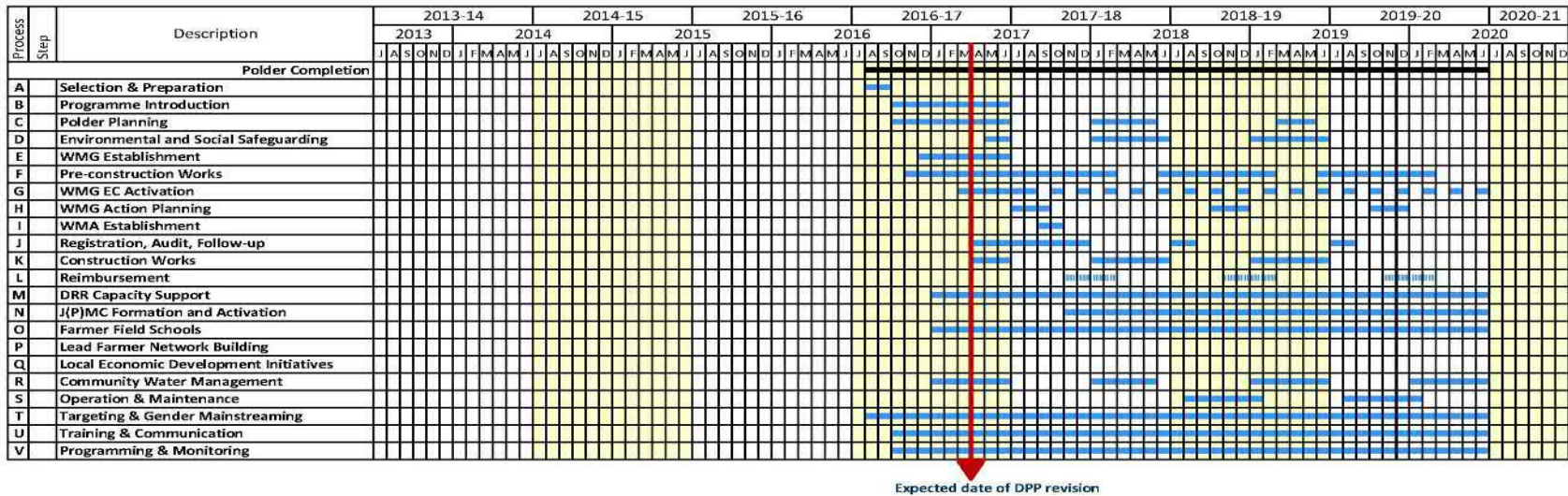


Figure 6: Polder Completion Timeline

## 5. Polder Budget

The overview of the estimated allocated budget for the polder activities in polder 27/1 is presented in Table 6.

**Table 6: Polder 27/1 Budget**

S.N	Task Name	Total Amount	
		BDT* <sup>x100000</sup>	EUR** <sup>x1000</sup>
1.0	<b><i>Institutional Framework for Participatory Water Management</i></b>	7.50	8.82
2.0	<b><i>Main Infrastructure</i></b>	668.43	786.38
3.0	<b><i>Internal Water Management</i></b> <i>(Polder-wise budgets are based on an average amount per CWM-site. In reality budgets will vary per CAWM-site)</i>	9.00	10.58
4.0	<b><i>Agriculture &amp; Marketing Services</i></b> <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>	25.00	29.41
5.0	<b><i>Environmental &amp; Social Management / Disaster Risk Reduction (DRR)</i></b>	35.00	41.18
6.0	<b><i>Training</i></b>	34.90	41.06
	<b>TOTAL</b>	<b>779.83</b>	<b>917.43</b>

**Note: Exchange rate is 1 EURO=85 BDT**

## Appendix 1. PDP Formulation Process<sup>3</sup>

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 4<sup>th</sup> 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)

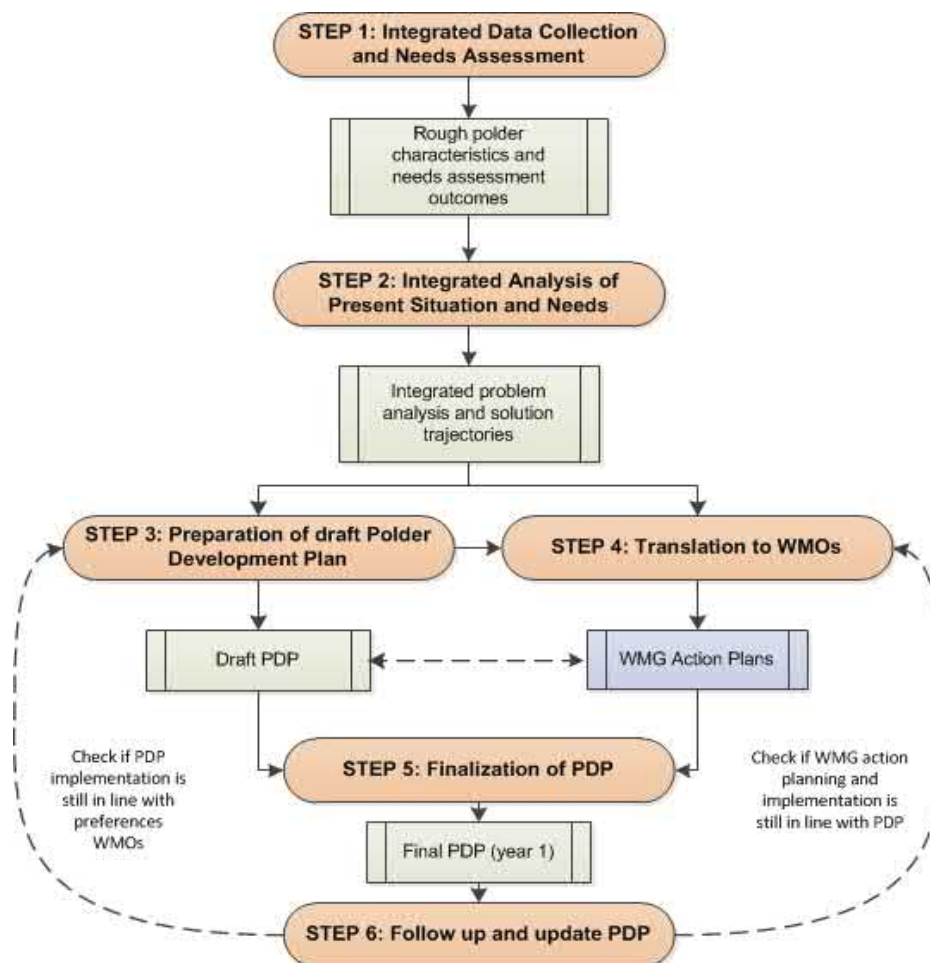


Figure 7: The steps of the PDP Formulation Process

### 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

<sup>3</sup> 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 27/1, 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 27/1

### Embankment

Total length of the embankment around polder 27/1 is about 30.42 km. The entire embankment is an interior embankment with a crest width of 4.27m and crest level of 4.27 m PWD.

### Sluices

There are 8 Sluices in this polder. These are:

S.N.	Name of Sluices	Number of Vents	Size, (mx m)	Location, km	Remarks
1.	Jelerdanga Sluice	2	0.90		
2.	Magurkhali Sluice	4	0.90		
3.	Mirzapur Sluice	2	0.90		
4.	Khoria Sluice	4	0.90		
5.	Koilashkhali Sluice	2	1.50 X 1.80		
6.	Katakhali (Ramkrishnapur) Sluice	2	1.50 X 1.80		Inactive
7.	Baliakhali Sluice	1	0.90		Inactive
8.	Khajura Sluice	3	0.90		Inactive

### Drainage Outlets

There are no Outlets in this polder.

### Irrigation Inlets

There are no Inlets in this polder.

### Khals

There are about 19 recognizable khals with branches and having a total length of above 73.00 km. The main khals are shown in Figure 2.