

Veduria Union, Bhola Sadar, Bangladesh Water Security Plan

August 2020









Wetlands International South Asia is a non-government organisation working for sustaining and restoring wetlands, their resources and biodiversity in the South Asia region. Its office in New Delhi (India) was established in 1996 as a part of Wetlands International network. Wetlands International

is a global, independent, non-profit organisation dedicated to conservation and restoration of wetlands, and presently works in over 100 countries through a network of 18 regional and national offices and expert networks headquartered in The Netherlands. Wetlands International is also one of the five International Organization Partners of the Ramsar Convention. In 2005, Wetlands International South Asia was registered under the Societies Registration Act of Government of India (retaining remit of South Asia region), consequently gaining an Indian legal entity while subscribing to the goals and targets of the Wetlands International network. The organisation endeavours to use a mix of approaches including technical knowledge, policy dialogue and field demonstrations for addressing various issues related to wetland management. To leverage change, the organisation works with national and state governments, knowledge centres, civil society as well as the private sector, often acting as catalysts to enable joined up actions. Given that securing a positive change in the status of wetlands and linked livelihoods takes considerable time, the organisation works for long-term engagement, forging strategic and innovative partnerships. https://south-asia.wetlands.org/



Development Organisation of the Rural Poor a national Non-Governmental Organisation (NGO) has been working in the development field for more than 2 decades in Bangladesh. The experiences of the organisation are not confined to specific field, rather diverse in action. The pioneer and founder of the organisation is the first-generation development activist in the country, along-with his companions who have also long experience in different areas of

development. https://www.dorpbd.org/

akvo.org

Akvo creates open source, internet and mobile software and sensors. It works with those that improve infrastructure and services, for disadvantaged populations. Akvo encourages and enables organisations to capture useful data in better ways, and provides training to improve skills in

gathering, mapping and visualising data over time. Akvo helps partners integrate and analyse their data with our sources, to improve understanding of complex situations. Akvo tools also improve reporting, communication and collaboration, by making it easy to publish and exchange data to improve performance and build understanding and support for approaches, projects or programmes. Akvo also advocates the full adoption of open-source and open-data standards in the international development. http://akvo.org

IRC is a think-and-do tank. The approach is different, and it is transformational. It involves everyone, in every part of the process, thinking and acting in new ways to find long-term solutions to the global crisis in water, sanitation and hygiene services. As a change hub, we are in a unique position to unite people to drive and champion change from the ground up. We need to convince district, country and global decision makers of what it will take

to achieve Sustainable Development Goal 6. https://www.ircwash.org/

WaterAid adopts core set of approaches aligned with WaterAid's global principles to implement WaterAid programmes that bring lasting change. The strategies towards bringing change revolve around the principles of rights to WASH, engaging districts and local governments, integration and sustainability. WaterAid integrates WASH into other areas of development and bring in elements from health, education, nutrition and other sectors into our work. WaterAid actively pursues mutually respectful and accountable partnerships with diverse entities to support the multifaceted work. https://www.wateraid.org/bd/



Simavi realises structural improvement to the health conditions of people in marginalised communities in Africa and Asia since 1925. Simavi invests in Water, Sanitation and Hygiene (WASH) and in Sexual and Reproductive Health and Rights (SRHR) because these basic services are vital for people to be able to

lead a healthy life, build a better existence and find a way out of poverty. Therefore, Simavi strives for a world in which basic health is accessible for all. Simavi aims to structurally improve the basic health of ten million people by 2020. Simavi works on this mission by collaborating closely with civil society organisations to build capacity and create structural, lasting change. http://simavi.org/



Veduria Union, Bhola Sadar, Bangladesh

Water Security Plan



July 2020





Project Team

Harsh Ganapathi (Wetlands International South Asia) Partha Sarathi Kuntal (DORP, Bangladesh) Tarun Kanti Das (DORP, Bangladesh) Mohammad Zobair Hasan (DORP, Bangladesh) Ranjan Kumar Ghose (WaterAid, Bangladesh) Dr Ritesh Kumar (Wetlands International South Asia) Mert Blommerstein (Akvo.org) Jigmy Lama (Akvo.org) Maria Stolk (Wetlands International Global Office)

Report prepared by Wetlands International South Asia and Development Organization of the Rural Poor for Veduria Union.

Report ID: 2020- Watershed - 01

Suggested Citation: Veduria Union, Bhola Sadar, Bangladesh- Water Security Plan 2020, Wetlands International South Asia, Development Organisation of the Rural Poor

Disclaimer

The presentation of material in this report and geographical designations employed do not imply the expression of any opinion whatsoever on the part of Wetlands International South Asia or Development Organization of the Rural Poor concerning the legal status of any country, or territory, or concerning delimitation of boundaries or frontiers. Usual disclaimers apply.

Photograph credits: WISA Photo Library unless cited Cover: Charkhali channel in Veduria Union Inside Cover: A rainfed pond in Ward 3 of Veduria Union Back Cover: Ferry terminal of Veduria Union

CONTENTS

BACKGROUND	1
Introduction	1
Purpose of this document	2
Document development process	3
CURRENT SITUATION OF WATER SECURITY IN VEDURIA UNION	4
Veduria Union – Landscape Settings	4
Population and economic activities	5
Water availability and use patterns	5
Status of WASH infrastructure	6
Water management arrangements	
KEY WATER RISKS OF VEDURIA	9
WETLAND SOLUTIONS FOR ADDRESSING WATER RISKS	
Increasing surface water availability	
Rejuvenating derelict ponds	
Improving natural channels	
BARRIERS AND ENABLERS	
Barriers	
Enablers	
IMPLEMENTING SOLUTIONS	
Roles and Responsibilities of Government actors	
Roles and responsibilities NGOs, CSOs and communities	
MONITORING AND EVALUATION MECHANISM	
Community based monitoring system	
Promoting awareness of sustainable WASH and water security	
Monitoring groundwater levels	
SUSTAINING OUTCOMES	
ACRONYMS	
GLOSSARY	
ANNEXURE	23

BACKGROUND

Watershed is a strategic partnership programme between the Dutch Ministry of Foreign Affairs, Wetlands International, IRC, Akvo, Water Aid, GWA and Simavi. The partnership aims at delivering improvements in the governance and management of WASH and water resources ensuring the sustainability of water resources they draw upon. Bhola Sadar, the largest island of Bangladesh has been identified by the partnership as the implementation area.

Wetlands International South Asia and Development Organization of the Rural Poor (DORP) provide support to the partnership for the inclusion of water security dimensions within capacity development and engagement activities. Water security linkages with WASH is being demonstrated for Veduria, a Union of Bhola Sadar.

Introduction

Veduria Union is one of the 13 Union of Bhola Sadar Upazila, a sub-district of Bhola which is the largest Island of Bangladesh situated at the mouth of Meghna River. The mainstay of livelihoods in Veduria is agriculture, was initially dependent on plentiful of freshwater available in the surface water bodies that provided an easy means for water storage. Post 1970s, with the advent of bore well technologies, the possibility of increasing agriculture intensity emerged, leading to a gradual reduction in dependence on surface water as a single source of freshwater. As the technology to tap deep-water aquifers became available especially with the help of government agencies, it was possible to augment freshwater for domestic use through deep bore wells. The role of surface water bodies (wetlands) became dysfunctional.

Measures for improved WASH infrastructure led to surface water bodies becoming ultimate receptacles of sewage. Wetlands, which were the sole water sources for drinking, cooking and irrigation, have been rendered dysfunctional. Groundwater is presently sourced from deep confined aquifers at depth over 1000ft as the shallow aquifers have turned saline due to saltwater intrusion.

Achieving sustainable WASH requires ensuring the sustainability of water sources and waste sinks. The disjoint between planning and management of water resources and WASH infrastructure is apparent in Veduria, in which the two sectors work at cross purposes. Increase in WASH coverage without considering water sources and waste sink functions has ultimately led to pollution in surface water bodies and lost opportunities for sustainably harvesting freshwater and linked livelihoods. The aquifer that runs from north to south east Bangladesh approximately 60 million people. There is a limit to which deep-water aquifers can be tapped, as by their geological characteristics, they are largely confined, and recharged at exceedingly slow rates, some even being non-renewable. Once deep-water aquifers are depleted or declining, water security would become a serious challenge for Veduria. Similar challenges are being faced in other Unions and parts of the country like Dhaka, where groundwater is declining at a much faster rate. Institutionally, the situation is rendered complex by several government agencies working within the water sector, each for their mandate (e.g. flood protection, provision of drinking water) without taking into consideration the impact on the other sector, and cumulative impact on the status of water resources and overall water security.

In this backdrop, Watershed Bangladesh has identified conjunctive surface water and groundwater use for WASH programming as an advocacy agenda. An enabling environment can be created by improving information base and use of surface water resources so that overall dependence on groundwater is reduced and water security maintained and enhanced.

Water security for Veduria Union is essential to ensure:

- Water for drinking and human wellbeing is available on a sustainable basis.
- Healthy wetlands support water, food and climate security and sustain livelihoods.
- Sufficient water is available to support agriculture, fisheries and other economic activities.
- Resiliency of communities to water related hazards such as floods and storm surges.



Almost all of the water for drinking and cooking is sourced from the deep aquifers in Veduria Union

Purpose of this document

This document presents the outcomes of water security planning for Veduria Union prepared under the ambit of Watershed Bangladesh strategic partnership. The document specifically highlights how improving water management in Veduria can enhance water security. This document is supposed to be a guide for local CSOs to engage with government functionaries and duty bearers on aspects of water security and wetlands management. It is recognized that achieving water security is a much larger agenda involving multiple sectors and factors which influence water availability and use and risks thereof. The focus of the present exercise is on WASH and water security linkages for drinking and domestic purposes. It is hoped that the document will feed into broader water security planning processes taking place within Veduria and beyond.

Document development process

The document was developed using a diagnostic approach based on evaluation of WASH status, wetlands status and management arrangement for WASH, wetlands and water. The evaluation was done based on

- Field surveys to identify water sources and status of water sources for WASH and water security
- Focus group discussions (FGDs) with key stakeholders to get an overview of wetlands status, major threats, management measures taken and limitations thereof.
- Perception surveys of households and communities to elicit information on general features, benefits, status and trends and management measures used in the wetlands.
- Safety analysis of water for WASH and water security by conducting water quality tests of pond and tube well water spread across the 9 wards of the Union.

Goals and objectives were set based on dialogues with water resource departments, local governing bodies, local CSOs and communities.

Implementing agencies and monitoring arrangements were identified to operationalize the actions in the water security plan.

The water security planning process is to sustain by building convergence with development programmes, institutions and governance mechanisms and replication and upscaling in other Unions of Bhola and beyond.



Stages of document development

CURRENT SITUATION OF WATER SECURITY IN VEDURIA

Veduria Union – Landscape Settings

Veduria Union is situated at the northwest of Bhola district (Location Coordinate: 22.6753 °N 90.5786 °E) and is one of the 13 Unions in Bhola Sadar Upazila spanning 49 square kilometres. It was formed due to deposition of the sediments of the Meghna river from the Tertiary and Quaternary age. The whole island of Bhola is situated in the Estuarine floodplains of the Meghna River. The Union comprises of nearly 1400 ponds (pukhur) and many natural channels (khal), such as Bhola Khal, Bankerhat Khal and Hatnerhat Khal. Distributaries of Meghna River like Tetulia and Ganeshpura flow across the Union. The landscape was formed as a result of deposition of the sediments by the Meghna river from the Tertiary and Quaternary age. The whole island of Bhola is situated in the Estuarine floodplains of the Meghna River from the Tertiary and River.

Veduria experiences a subtropical monsoon climate characterized by wide seasonal variations in rainfall, moderately warm temperatures, and high humidity. Situated at the deltaic regions of the Bay of Bengal it is one of the most climate-vulnerable regions in the country. The region is exposed to meteorological, hydrological

and seismic hazards. Veduria receives an average annual rainfall around 2300 mm with a highest monthly rainfall in June to September and low rainfall in November to March. The mean temperature of the Union during the summer and winter months range from 26-28 °C and 18-24°C. April and May are the hottest months in summer and Union experiences the highest

evapotranspiration loss in May (~220 mm).



Location and Landscape of Veduria Union

Population and economic activities

The 9 wards of the Union are inhabited by 8,580 households, having a population of ~31,000. The mainstay of livelihood is agriculture and fishing, secondary occupations are horticulture, animal husbandry, commercial markets, carpentry, trade, etc. There are two major docking stations in the Union which are used to transport people and good through the Meghna waterways.

Water availability and use patterns

Wetlands dot the landscape of Veduria Union and with copious rainfall, substantial amount of water is available mostly throughout the year. The major surface water sources in Veduria are ponds (pukhur), natural channels (khal) and rivers (nadi) and the groundwater is sourced from deep aquifers using deep tube wells that extend over 300 metres.



An illustration depicting the approximate water balance of Veduria Union

Water for drinking and domestic purposes like bathing and washing are mainly sourced from groundwater which is extracted using deep tube wells. Ponds which are mostly rainfed and sewage fed are mainly used for aquaculture, catering to livestock needs and domestic proposes like washing clothes and cleaning houses. The natural channel and river waters are mainly used for agriculture and industrial use. A household survey indicated that all water for drinking and cooking is sourced from groundwater using tube wells. An average of 350 and 320 litres of water per day is used from a tube well and a pond respectively.



Water use pattern from tube wells and ponds



Pond water being used to wash utensils

Status of WASH infrastructure

Water for WASH is majorly extracted from ~870 deep tube wells and ~1400 ponds in the Union. There is plenty of water available in the surface, yet more than half of the total water demands are met by the groundwater sourced from deep aquifers. This is attributed to the poor conditions of the WASH infrastructure and surface water. The have the ponds become ultimate receptacles of household sewage and wastewater. Many toilets discharging waste and contaminating surface water are built right on top of the natural channels or near to the ponds Most of the natural channels are choked with garbage and hyacinth. Poor wastewater management and improper waste disposal practices have forced the communities to rely completely rely on groundwater to be used for domestic purposes.



A toilet discharging waste directly into the pond

According to the household survey most of the ponds in Veduria Union are embanked by built structures like rocks and bricks and natural structures like tree lines. Embankment plays a major role in infiltration from the ponds and water retention in the ponds. Around 91 % of the ponds are fully and partially embanked and retain water throughout the year whereas 9% of the ponds do not have embankment and retain water for around 6-9 months in a year. Most of the natural channels have brick or mud embankment to augment proper drainage.

The water quality tests conducted for the tube well water and the pond water indicate that Around 90% of the tube well water tested had a low risk of E Coli contamination and is safe for drinking. Whereas 97% of the pond water is at a very high to high risk of E Coli contamination and is unsafe for drinking. The pond water tested indicated a significant amount of nitrate, phosphate and ammonia contamination due to sewage disposal in them. Presence of water hyacinth and algae in the ponds are indicators of the same.



Density map of ponds in Veduria Union



A CSO member testing water sample of a pond onsite to check the quality of the pond water used every day by the nearby residents.

Water management arrangements

Water Management in Veduria is vested with the Bangladesh Water Development Board (BWDB), Department of Public Health Engineering (DPHE) and Local Government Engineering Department (LGED) to ensure equitable supply of water to the residents. The natural channels are owned and managed by the BWDB and LGED. Their work involves river bank conservation and re-excavation of existing ponds and natural channels.

The ponds are largely owned by private (single and multiple user groups) residing around them and are responsible for their operation and maintenance. However, the community survey indicated, despite the ponds falling under the ownership of the users they rely on government departments on its management.

The Water Act 2013, Water Ordinance 1983 serve as legalities for actions related to wetland encroachment, groundwater overdraft, obstruction of channel flows and waste disposal into wetlands. Apart from these legal arrangements, informal arrangements are enforced by communities to prevent dumping of solid waste and untreated sewage into the wetlands.

The Upazila Parishad and the Union Parishad govern and implement major structural measures like: installation of tubewells. maintenance of existing tubewells, building of small culverts and reexcavation of channels. They also take measures to increase in budget allocation for WASH. wetland monitoring, and creation and enforcement of legal framework at Upazila and Union levels.



Re excavation of Bhola khal by BWDB

KEY WATER RISKS OF VEDURIA

Veduria has been subjected to various water risks to which wetland degradation, effects of climate change and lack of integrated water and waste planning are the major causative factors in driving risk. The key water risks for the Union are enlisted below.



Unsustainable water source

Water from deep aquifers is a finite resource. This resource cannot be tapped endlessly.

Polluted wetlands are health hazards

Over 80% of wetlands are moderate to highly polluted. Polluted wetlands are a source of various water-borne diseases like cholera and jaundice.





Increasing salinity

The land around the shorelines is progressively becoming saline and unfit for major crops.

Saline lands contaminate shallow groundwater and vice versa.

Severe coastal erosion

Bhola Island is a 'climate change hotspot' facing complex threats, key being high rates of coastal erosion and increasing frequency of tropical cyclones and storm surges resulting in flooding, destruction of WASH structures and overflow of pit latrines.





Current WASH infrastructure contaminates wetlands

Most of the toilets discharge waste into the wetlands, thus contaminating surface water.

Most of the wetlands are choked with algae and hyacinth.

With wetland degradation, freshwater wedge is reduced

As wetlands are degraded and converted, the freshwater wedge between saline groundwater in shallow aquifers is lost. This leads to increasing salinity in the landscape.





Wetlands have lost their relevance as a water source over a period of time

As polluted surface water is unfit for domestic use, communities have switched to use of groundwater which in turn led wetlands to decay.

Wetland degradation reduces extreme event buffer

Degradation of wetlands makes the island more prone to extreme events like flood and storm surges.





Impacts of wetland degradation to various beneficiaries based on the perception survey from Dhania and Veduria Union



High eutrophication is observed in the ponds of Veduria

WETLAND SOLUTIONS FOR ADDRESSING WATER RISKS

Despite rainwater being available in plenty, it cannot be utilized as wetlands are degraded and polluted. Salinization of shallow aquifers makes the matters worse. However, the ponds offer approximately 75 hectares of catchment area for storing water and the natural channels allow sufficient transport of river and rainwater within the Union. The ways in which these natural infrastructures can be transformed into sustainable sources of water to maximize surface water use are illustrated below.

Increasing surface water availability

Rainwater harvesting

Rainwater over other water sources is the purest of all water forms. It is free from pollution and it always better in quality than the groundwater as it does not come in contact with rocks and soil. Rainwater harvesting is a technique of collection and storage of rainwater at surface or subsurface before it is lost as surface runoff.



A typical rainwater harvesting mechanism



Sloped roof sheds in Veduria present ideal conditions[®] for rainwater harvesting

The ~8,000 houses of Veduria have 0.3 million square meter roof catchment which can be used to recharge 0.4 million cubic meters in a year.

A typical household rainwater harvesting system has:

- Half-cut pipes (gutters) to collect and divert rainwater to downspout or conduits.
- Downspout conduits, that carries water from gutters to storage tanks. A tank of 1000 litres is good enough for a family of 4 members.
- A first flush pipe to let go of the contaminated water of first rain.
- A simple gravel sand filter for filtering rainwater before it enters the storage tank
- Pipe systems to divert the excess water from storage tanks to the ponds.

Pond Sand Filtration

Water from a pond, when passed through a sand filter, can make it usable for domestic purposes.

Pond Sand Filters can serve as many as 300-500 users per unit with quality water that is better than pond water. The water it supplies is less turbid and bacteria-free.

Pond sand filters are widely used in other parts of coastal Bangladesh like Khulna, Satkhira, Bagerhat districts.



A pond sand filtration setup

Rejuvenating derelict ponds

Ponds that have been contaminated or destroyed by discharging sewage and dumping of garbage can be bought back to use by sustainable protocols and maintenance. The figure below illustrates ways in which a derelict pond can be rejuvenated by simple human actions.



Interventions for rejuvenating degraded ponds

Improving natural channels

The degraded and choked channels can be improved to allow an uninterrupted flow of water for various activities like fishing, agriculture and domestic use. This can be done by undertaking actions illustrated in the figure below.



Interventions to improve natural channels



A restored natural channel in Bhola

BARRIERS AND ENABLERS

Despite the many solutions to implement the water security plan, use remains far short of the potential. The key barriers and enablers are presented below that constrain and support the implementation of water security plan in Veduria.

Barriers

- Limited budget is allocated at the Upazila level for implementing the solutions highlighted in the water security plan
- Sectoral thinking is a barrier wherein different departments work in line with their vision and agendas. The split among responsibilities within various stakeholders creates confusion as to who is the owner, who and who is responsible for operation and maintenance.
- Community involvement in lobbying for operationalizing the water security action plan is limited. The current lobbying is being done by the national and local CSOs.
- Decision makers tend to rely on past experiences and resisting to experiment and change hence uptake of natural infrastructure remains a barrier. The pond water if prevented from offer sufficient storage and supply to cater to many needs and reduce the burden on the limited groundwater.
- Lack of sufficient information on actions that lead to sustainable WASH and water security at community and grassroots level.
- Lack of understanding on the drawbacks of deep groundwater use may make people over reliant on it and/or plan larger abstractions.

Enablers

- Veduria's landscape offers significant scope to implement the solutions proposed in the water security plan as the natural infrastructure is still intact with the landscape dynamics.
- CSOs and NGOs enable awareness spreading and capacity building of the local water management citizens committee to lobby for the needs to improve WASH and water security situation in Veduria.
- Union Parishad of Veduria has planned to implement the water security plan.
- The water security planning process has been upscaled to Dhania and Velumia Union in Bhola Sadar Upazila.
- WASH and IWRM standing committee is formed in Bhola to address the water management issues in the Upazila.
- Multi stakeholder partnership can lead to shared visions and can deal with multiple challenges in water management.

IMPLEMENTING SOLUTIONS

Various Government and Private authorities are responsible for implementing the actions for ensuring water security of Veduria. The roles and responsibilities of the concerned authorities are listed below:

Roles and Responsibilities of Government actors

Ministry of Water Resources (MoWR)

• Institutionalizing the water security plan.

Department of Public Health Engineering (DPHE) and Local Government Engineering Department (LGED)

- Design rainwater harvesting and pond sand filtration units.
- Rejuvenate derelict ponds.
- Monitor water quality and groundwater levels.
- Management of domestic and toilet waste.
- Ensuring the sustainability of the water security plan

Bangladesh Water Development Board (BWDB)

• Re- excavation of choked and encroached channels.

Union Parishad and Upazila Parishad

- Allocate budgets for rainwater harvesting and pond sand filtration system.
- Expend the annual development budget with getting schemes from the Union Parishad to implement the water security plan.

Roles and responsibilities NGOs, CSOs and communities

Civil Society Organizations (CSOs) and Non-Governmental Organizations (NGOs)

- Lobby and Advocacy to implement the Water Security Plan.
- Tracking of budget allocated and used in WASH and water security implementation.
- Conduct stakeholder dialogues and meetings for development activities for the Union.
- Conduct awareness programs, support government while implementing development programs.
- Support Local Government and the duty bearers with the implementation of the water security plan

Communities

- Monitor wetland status and health.
- Form WASH committees at the community level.
- Protect wetlands from pollution and degradation.
- Support duty bearers and government in the development programmes.
- Provide feedback using citizen scorecard to evaluate government WASH services.

MONITORING AND EVALUATION MECHANISM

Monitoring is required to assess the changes for indicating the effectiveness of the solutions for achieving sustainable WASH and water security. A monitoring system would help in evaluating the effectiveness of the implementation of the water security plan and aid in improvising the process. Ways in which the effectiveness of implementing wetland solutions can be monitored and evaluated are as follows.

Community based monitoring system

Health Cards

A wetland health card can be prepared for the various water sources like the ponds, tube wells and channels from which the water is abstracted for daily use and update it once in six months. A sample format of the health card is available in the annexure.

Budget tracking

The budget acquired and expended for the improvement of WASH services is publicly displayed at the Union Parishad Building. It will help communities keep a track of the development actions taking place in the Union. The budget chart is revised annually.



Annual budget of 2020-2021 painted on the wall for public display at Veduria Union Parishad building

Citizen scorecards

Citizen Scorecard is an influential tool to understand the satisfaction level of citizens on service providers. This

Dangiadesin Water De	veio	201	7	T	201	9		2	5100		un	oppoi	cui	,						
	2017 2018					aadhark	availability and						ас	ces						
		Score (Ou	rt of 10)	Score (Out of 10)							,									
Mini Scenario	Good (8-10)	Good Moderate Need (8-10) (4-7) (1-3)			Moderate (4-7)	Need Improvement (1-3)		security and thus						s loca						
There are mechanisms in place to identify (in a participatory manner) and address the water needs of vulnerable and marginalized groups								9	syst	hei	m, aı									
Public budgets provide specific funding to address the water related issue for		D	epatmen	nt of	Public	Healt	h Engi	ineer	ing-D	PHE										
river erosion cause problem of	2						20	2017 2018												
Integrated approaches (involving	- [Citizen's F Score (O				's Feedback Citize (Out of 10) Scon			Citizen's F Score (Os	eedback it of 10)								
different administrations) have been adopted to support the delivery of water services for vulnerable and	Mini Scenario				Good (8-10)	Moderate (4-7)	Impro	vement I-3)	Good (8-10)	Moderate (4-7)	Need Improvement (1-3)									
marginalized groups	- Ya	our judgm	ent about D	PHE o	on				10	cal Gov	eroment E	ngino	oring							
usages of water in irrigation and other relevant issues.	Pr Ti	providing support to con Tube well installation			providing support to a Tube well installation		providing support to con Tube well installation		ng support to community ell installation						Eocal Government E				20	
Provide support people for creating	Your judgment about DPHE on providing support to community on Tube well repairing												Citizen's Score (I							
federation, group, cooperatives on "Water Management" at Bhola									Mini Scenario			•	Good (8-10)	Modera (4-7)						
Operation and Maintenance of Water control infrastructure	- Yo pr sa	 Your opinion about DPHE on providing support to community on sanitation 							Integra differe adopti	ated app nt adm ed to su	proaches (i inistrations pport of P	involving) have been WRM for								
	DPHE provide service on time/waiting								Public	Inerable and marginalized groups blic budgets provide specific funding										
	Your opinion shout DPHE on					-		-	to add	ddress the water related issues										
providing test services for water									rubber dam of vulnerable and marginalized groups											
									LGED need of people	has me of worm tor flo	chanism fo en and mar od manage	r addressing ginalized ment.								
Citizen score cards	for	BWI	DB. DF	PHE	and	LG	ED a	are	Provid ivelihe flanag	le traini ood dev ement	ng and sup elopment Cooperati	port for of local "Water ve"								
ised in Bhola to sti	ren	gthe	n acco	oun	tabil	lity	and		There dentif iddres of yulr	are me y (in a p is the w verable	chanisms is participator ater and s and margin	n place to ry manner) and anitation needs valized groups								
performance in pul	blic	serv	ice de	live	ery				four o	pinion	about LGE	D on canal								

to measure the quality, affordability, sibility of service for WASH and water I level actions required to maintain water expand or upgrade the system, and to plan

nd budget for full coverage.

Promoting awareness of sustainable WASH and water security

By promoting awareness on sustainable WASH and water security in the Union will ensure increased capacity knowledge of the communities and local CSOs to partake in dialogues and implement community led water management. Ways to enhance the capacity of the communities on sustainable WASH and water security are:

- Preparing and maintaining a register of water sources (wetlands, tube wells, drainage channels).
- Conducting street plays.
- Broadcasting community videos and spreading messages through media.
- Identifying local champions for sustainable WASH practices.
- Creating wetland stewardship.
- Placing the water security and wetlands in the agenda of the Union Parishad.
- Conducting nature walks.
- Including WASH and water management in the curriculum of schools and academic institutes.



Water management practices for sustainable WASH and water security informed to the communities using loudspeakers

Monitoring groundwater levels

The over reliance on deep groundwater will lead to depletion if not used sustainably in conjunction with the surface water. Since deep groundwater is a finite resource and recharge at exceedingly slow rates the levels need to be monitored to undertake groundwater management measures. Piezometers can be installed in the various wards of the Union to measure the extent of groundwater use. The piezometric water levels can be measured seasonally or annually to determine the positive and negative drawdown.

SUSTAINING OUTCOMES

Implementation of the water security plan is mapped with various developmental schemes of central and local governments. Watershed Bangladesh consortium builds the capacity of community institutions in leveraging available resources.

Watershed Bangladesh programme is working with various government organizations like the Bangladesh Water Development Board (BWDB), Department of Public Health Engineering (DPHE), Local Government Engineering Department (LGED) to embed water security planning in the National Plan for securing water for WASH and IWRM.

Process and outcome documents are shared with Union Parishad, Upazila Parishad, water resource management (WRM) departments and leading WASH sector organizations as WaterAid for replication and upscaling.

ACRONYMS

- **BWDB** Bangladesh Water Development Board
- CSO Civil Society Organization
- DPHE Department of Public Health Engineering
- E Coli Escherichia coli
- FGD Focus Group Discussion
- IWRM Integrated Water Resource Management
- LGED Local Government Engineering Department
- MoWR Ministry of Water Resources
- NGO Non-Governmental Organizations
- WASH Water Sanitation and Hygiene
- WRM Water Resource Management
- WSP Water security plan

GLOSSARY

Aquifer: a body of permeable rock which can contain or transmit groundwater.

Confined aquifer: an aquifer below the land surface that is saturated with water. Layers of impermeable material are both above and below the aquifer, causing it to be under pressure so that when the aquifer is penetrated by a well, the water will rise above the top of the aquifer.

Domestic water: water used for indoor and outdoor household purposes— all the things you do at home: drinking, cooking, bathing, washing clothes and utensils, water for sanitation etc.

Drawdown: the reduction in level of water observed at a well in an aquifer, typically due to pumping.

Evapotranspiration: the process by which water is transferred from the land to the atmosphere by evaporation from the soil and other surfaces and by transpiration from plants.

Focus Group Discussions: a discussion that involves gathering people from similar backgrounds or experiences together to discuss a specific topic of interest.

Freshwater: any naturally occurring water except seawater and brackish water. Fresh water includes water in ice sheets, ice caps, glaciers, icebergs, bogs, ponds, lakes, rivers, streams, and even underground water called groundwater

Geology: the study of the Earth, the materials of which it is made, the structure of those materials, and the processes acting upon them.

Groundwater: water held underground in the soil or in pores and crevices in rock.

Household: a house and its occupants regarded as a unit.

Natural channel: a type of landform consisting of the outline of a path of relatively shallow and narrow body of water, most commonly the confine of a stream like river and canal.

Piezometer: a device which measures the pressure of groundwater at a specific point. Piezometers are often placed in boreholes to monitor the pressure or depth of groundwater.

Quaternary age: the quaternary period began 2.6 million years ago and extends into the present.

Tertiary age: interval of geologic time lasting from approximately 66 million to 2.6 million years ago.

Tubewell: a type of water well in which a long, 100–200 millimetres-wide, stainless steel tube or pipe is bored into an underground aquifer. The lower end is fitted with a strainer, and a pump lifts the water.

Union: the smallest rural administrative and local government units in Bangladesh.

Upazila: formerly called thana, is an administrative region in Bangladesh. They function as sub-units of districts.

WASH: a collective term for Water, Sanitation and Hygiene. Due to their interdependent nature, these three core issues are grouped together to represent a growing sector. While each a separate field of work, each is dependent on the presence of the other. For example, without toilets, water sources become contaminated; without clean water, basic hygiene practices are not possible.

Water risk: "Water risk" refers to the probability of an entity experiencing a deleterious water-related events.

Water security: the capacity of a population to safeguard sustainable access to adequate quantities of acceptable quality water for sustaining livelihoods, human well-being and socio- economic development, for ensuing protection against water-borne pollution and water-related disasters and for preserving ecosystem in a climate of peace and political stability.

Wetland: a distinct ecosystem that is flooded by water, either permanently or seasonally, where oxygen-free processes prevail. The primary factor that distinguishes wetlands from other land forms or water bodies is the characteristic vegetation of aquatic plants, adapted to the unique hydric soil.

ANNEXURE

Total Household								Toilets				Tube wells				
Union	Ward No.	Total	Rich	Middle Class	Poor	Ultra-Poor	Hygienic	Unhygienic	Non-Shared	Shared	With Platform	Without Platform	Shared	Damaged	Ponds	Reserve Ponds
	1	1300	125	172	475	520	235	628	826	37	125	13	8	3	139	5
	2	1050	220	380	250	168	357	670	1004	23	48	65	16	3	368	0
	3	1150	105	280	380	340	193	930	1096	27	70	85	40	4	240	0
<u>.</u>	4	980	140	330	365	120	340	585	870	55	85	37	5	13	248	0
qri	5	950	7	110	238	589	225	698	896	27	58	7	4	2	94	2
Ş	6	750	9	85	227	421	140	575	680	35	64	8	7	0	88	1
	7	800	15	127	280	373	158	612	740	30	76	9	4	1	95	5
	8	1100	27	140	327	598	130	930	1020	40	67	12	5	5	78	0
	9	8580	663	1709	2757	3309	1948	5908	7532	324	620	252	91	33	1396	13
Grand Total				8580				75	86			87	2		1396	13

Information from social mapping at Veduria Union

Water Quality



Map of surveyed and tested ponds and tube wells in Veduria Union



Color and odor of the pond water



Electrical conductivity of pond and tube well water in Veduria Union



Phosphate, Nitrate, Nitrite, and Ammonium levels of the pond water in Veduria Union



Percentage of E coli contamination tested for tube wells and ponds respectively

Health card for pond

	HEALTH	CARD	•		•					
Name of the puhkur/ Owner name	Union Name	Date								
Age of the pukhur	Ward Name	Ward Name								
Area of the pukhur in hectares	Ward Number									
Depth of the pukhur										
Score	0	2	4	6	8	10				
Proportion of daily water use drinking and cooking	Not used	20 percent	40 percent	60 percent	80 percent	100 percent				
Proportion of daily water use for other domestic purposes like bathing, washing and sanitation	Not used	20 percent	40 percent	60 percent	80 percent	100 percent				
Color of the water	Opaque	Colored, muddy and translucent	Muddy and translucent	Translucent but not muddy	Muddy but not translucent	Clear				
Odor of the water	Putrid	High odor	Moderate odor	Less odor	Very less odor	Odorless				
Level of Algal bloom	Pond completely covered by algae	High algal bloom	Moderate algal bloom	Less presence of algae	Very less presence of algae	No presence of algae				
Greywater discharge into the pond	Greater than 60 percent discharge	40-60 percent discharge	20- 40 percent discharge	10- 20 percent discharge	5-10 percent discharge	No discharge				
Blackwater discharge into the pond	Greater than 60 percent discharge	40-60 percent discharge	20- 40 percent discharge	10- 20 percent discharge	5-10 percent discharge	No discharge				
Level of solid waste dumping	Very high dumping	High dumping	Moderate dumping	Less dumping	Very less dumping	No solid waste dumping				
Encrochment since 2000	More than 50 percent encroached	20-30 percent encroached	10-20 percent encroached	5-10 percent encroached	5 percent encroached	No encroachment				
Embankment status			No embankment	Broken or damaged embankment	Partially embanked	Fully embanked				
Total score out of 100										
	<u> </u>	Less than 40	40-60	60-80	80-90	90-100				
Health Status		Bad	Fair	Good	Very Good	Excellent				

"We Safeguard and Restore Wetlands for People and Nature"



Wetlands International South Asia A 25, Floors 1 & 2, Defence Colony New Delhi – 110024, India Tel: +91 11 24338906, 46038906

Email: wi.southasia@wi-sa.org URL: www.south-asia.wetlands.org

