Fourth Primary Education Development Program (PEDP-4)

Semi-Annual Environmental Monitoring Report

Jan'2023 – June'2023

Department of Public Health Engineering (DPHE)

[A report on WASH facilities and its environmental impact under PEDP-4]

Primary Education Unit, DPHE, Dhaka

June, 2023

Contents

ABBREVIATIONS & ACRONYMS

ADB	:	Asian Development Bank
DLI	:	Disbursement Linked Indicator
DP	:	Development Partner
DPEO	:	District Primary Education Officer
DPE	:	Directorate of Primary Education
DPHE	:	Department of Public Health Engineering
DTW	:	Deep Tube Well
EFA	:	Education For All
EMF	:	Environmental Management Framework
EU	:	European Union
GOB	:	Government of Bangladesh
GPE	:	Global Partnership for Education
IDA	:	International Development Association
IPG	:	Infrastructure Plan and Planning Guidelines
JARM	:	Joint Annual Review Mission
JCM	:	Joint Consultation Meeting
JICA	:	Japan International Cooperation Agency
LGD	:	Local Government Division
MLGRD&C	:	Ministry of Local Government, Rural Development and Cooperatives
MoPME	:	Ministry of Primary and Mass Education
MOU	:	Memorandum of Understanding
PEDP-4	:	Fourth Primary Education Development Program
QLEAP	:	Quality Learning for Education Access and Participation
RDPP	:	Revised Development Project Proforma
SDTW	:	Semi Deep Tube Well
SEC	:	Small Ethnic Community
STW	:	Shallow Tube Well
TSP	:	Tube Well with Submersible Pump
UNICEF	:	United Nations International Children's Emergency Fund
WB	:	World Bank

EXECUTIVE SUMMARY

The prime objective of PEDP-4 is to ensure an efficient, inclusive and equitable primary education system through a child friendly physical learning environment. Infrastructural development in terms of construction of class rooms and wash blocks, installation of safe drinking water points plays an important role in achieving the sustainable physical learning environment as well as ensuring holistic development of children. Department of Public Health Engineering (DPHE) is solely responsible to provide the water supply and sanitation facilities in the primary schools of Bangladesh. As per the approved revised DPP (RDPP) of PEDP-4 DPHE will install 20,000 new water points and construct 58,000 Wash Blocks in the primary schools of Bangladesh throughout the program tenure (July/2018 to June/2025) of 7 years. In addition, DPHE will conduct water quality tests of earlier installed water points (lists to be issued by DPE) and undertake major maintenance of wash blocks constructed during PEDP-3 on the basis of actual needs. From the beginning of the project until June/2023 DPHE installed a total of 12,944 new water points and constructed 19,216 Wash Blocks. Of them 3,608 water sources and 5,706 wash blocks were constructed during the reporting tenure. In addition, DPHE conducted major maintenance of 7,392 wash blocks from the beginning of the project.

The sole purpose of this study is to identify any concern or issue related to the environmental safeguard due to the construction of wash blocks, installation of water points and major maintenance of wash blocks from January/2023 to June/2023. The study is based on the environmental safeguard screening conducted during planning, construction and post implementation stages. The screening format is prepared based on the MoPME approved EMF for PEDP-4. The screening covered different environmental safeguard indicators such as loss of agricultural land, blockage in the drainage system, instance of water logging, provision for access to safe drinking water, provision of hand washing and hygiene facilities etc.

The screening was conducted by DPHE officials i.e. Sub-Assistant Engineers at the Upazilla level which was duly verified in district level by the Supervision Consultants, Executive Engineers and compiled in DPHE headquarter. The environmental monitoring screening during the reporting tenure confirmed no significant instances or issues that may hamper or influence environmental safety. Being an implementing agency, DPHE would like to uphold this status in its ongoing and upcoming works related to infrastructural development.

1. Introduction

Bangladesh, a country with its astonishing economic boom is rapidly progressing towards its journey to become a trillion-dollar economy. For a rapidly developing country like Bangladesh, it is of utmost importance to ensure the holistic development of the children which includes both intellectual and emotional development in such a manner that they can uphold the nation from all aspects. This has been eloquently articulated in the Constitution of Bangladesh as well. The fourth Primary Education Development Program (PEDP-4) is the continuation of the Government's approach to thriving the excellence of children through the fulfillment of several distinct milestones including the construction of need-based infrastructures for sanitation and water supply. The program is supported by significant contributions from the Government as well as Development Partners (DPs). Department of Public Health Engineering (DPHE) under the Local Government Division (LGD) of the Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) is involved in the capacity of implementation partner to provide the quality water supply and sanitation facilities in the primary schools of Bangladesh. As per the MoU signed in between DPE and DPHE and as per the revised DPP (RDPP) of PEDP-4, DPHE will perform the following activities in the project tenure with an aim to provide safe drinking water and sanitation services in the primary schools under PEDP-4.

- Install 20,000 new drinking water sources in the primary schools.
- Conduct water quality testing of 65,000 water points installed earlier.
- Construction of 58,000 new Wash Blocks in 29,000 primary schools.
- Major maintenance of approximately 10,000 wash blocks constructed in PEDP-3.
- Water supply and sanitation facilities in 650 DD, DPEO, URC, and PTI offices.
- Operation and maintenance (O/M) of water points.

With the continuous support of the Bangladesh government and development partners, the 4th Primary Education Development Program (PEDP-4) has accelerated considerable progress in the installation of water sources and environment-friendly wash blocks in the primary schools of Bangladesh through DPHE.

2. Purpose of the current report

The basic intent of this report is to identify and resolve any anticipated environmental safeguard issues that may arise during the installation of water sources or construction of Wash Blocks in the primary schools of Bangladesh. This report will encompass and summarize the findings of the environmental screening conducted during the installation of water points and construction of Wash Blocks in the primary schools of Bangladesh from the tenure of January'23 to June'23. During the

implementation of the project, environmental monitoring screening was conducted based on the Environmental Management Framework (EMF) of PEDP-4. The purpose of this report is listed below.

- To modify some of the tools based on the experiences gained from PEDP-3 to ensure that neither the infrastructure (both in terms of needs and quality at primary schools) nor the environment is compromised through the program intervention.
- To establish the mechanism to determine and assess future potential environmental impacts of WASH infrastructure that are to be identified and cleared based on a community demand-driven process and to set out mitigation, monitoring, and institutional measures to be taken during implementation and operation of the WASH infrastructure to eliminate adverse environmental impacts or to reduce them to acceptable limits.
- To ensure that the envisaged purpose of PEDP-4 is achieved and results in desired benefits without adversely affecting the environmental resources.
- To avoid potentially adverse environmental impacts and enhance environmental outcomes the program is expected to have limited and minimum adverse environmental impacts.
- To address any grievances originating from the implementation of the project.

3. Indicators of environmental safeguard as per EMF under PEDP-4

This report covers different distinct environmental monitoring indicators based on the MoPME-approved EMF of PEDP-4. Principles relevant to the environmental management of WASH (Water Supply, Sanitation and Hygiene) in PEDP-4 are mentioned below.

- Annual water quality monitoring of all the installed (installed at least one year earlier and lists to be provided by DPE) tube-wells will be carried out to ensure safe drinking water facilities to the students and teachers.
- Provision for adequate sanitation facilities for the teachers and students will be made and the mechanism for regular cleaning, routine and major maintenance will be implemented.
- To solve the drinking water problem in remote hilly and coastal areas, rainwater harvesting and other feasible options will be explored.
- To address the post COVID-19 crisis for adaptation to the new normal.

In general, the following indicators require to be monitored during the planning, construction and post-implementation phases.

i) Losses of agricultural lands
ii) Drainage congestion/water logging
iii) Surface water pollution
iv) Dust and noise pollution
v) Safe distance between tube-wells and sanitary latrines
vi) Occupational health hazards and safety practices

vii) Maintenance of water supply and sanitation facilities

viii) Maintenance of air and water quality

ix) Management of surrounding ecosystem and biodiversity (if any) etc.

x) Ensure that COVID safety protocols are well adhered.

A thorough screening of the above indicators was carried out during the reporting tenure. The Photo logs of safeguard monitoring are shown in Appendix-10.

4. Methodology

With an aim to investigate the impact of infrastructural development on environmental safeguards, a thorough screening was carried out in the respective primary schools by the concerned sub-assistant engineers of DPHE. The screening results were duly verified by the respective assistant engineers and a database was prepared at the Upazilla level in the web-based platform of DPHE under PEDP-4 known as Total Information Management Systems (TIMS). Executive engineers at the district level compiled the verified database obtained from the Upazilla level and sent them to DPHE Head Quarter through TIMS, where the database was finally compiled and the report was prepared by the environmental and social safeguard specialist under the supervision of the focal point of PEDP-4.

Data for environmental safeguard screening during the installation of water sources and construction of Wash Blocks have been collected from the schools through DPHE official sources using the structured format (copy enclosed in Appendix-1 of this report). Data collected from grass root level have been entered into the web-based platform of DPHE under PEDP-4 known as TIMS and kept structured for reporting. A flow diagram of the screening method is depicted in Fig. 1.

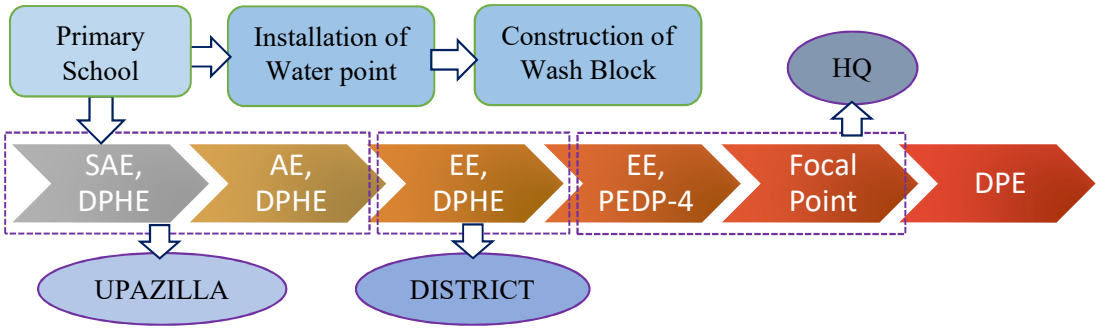

Fig. 1 Method of environmental safeguard screening

5. Role of DPHE in comprehensive monitoring

The subcomponents (sub components 2.3 and 2.4) of PEDP-4 especially the infrastructural implementation is comprehensively monitored by several parties from the commencement to the operational phase. Fig.2 shows the monitoring scheme in PEDP-4 operated by different agencies. Being

an implementing agency, DPHE is involved significantly from construction till post-construction monitoring. Role of DPHE is depicted in Fig.3. It can be noted that the defect liability period for installed water points and constructed wash blocks are 02 and 01 year respectively. This implies that contractor is responsible to rectify any sort of defects within this time frame counting from the date of handover of tube well and wash block. In order to get a clear picture of ongoing and completed works, DPHE district office arranges monthly monitoring meeting with all concerned officers and staffs of that district. Executive Engineers thus address the issues of monitoring to the assistant/ sub assistant engineers monthly. Officers of concerned district along with newly appointed supervision consultant used to visit the sites frequently in order to monitor the ongoing and completed works and also focus on the environmental safeguard aspect. Visit of senior supervision consultant from Focal Point's Office and DPHE Head quarter happens frequently.

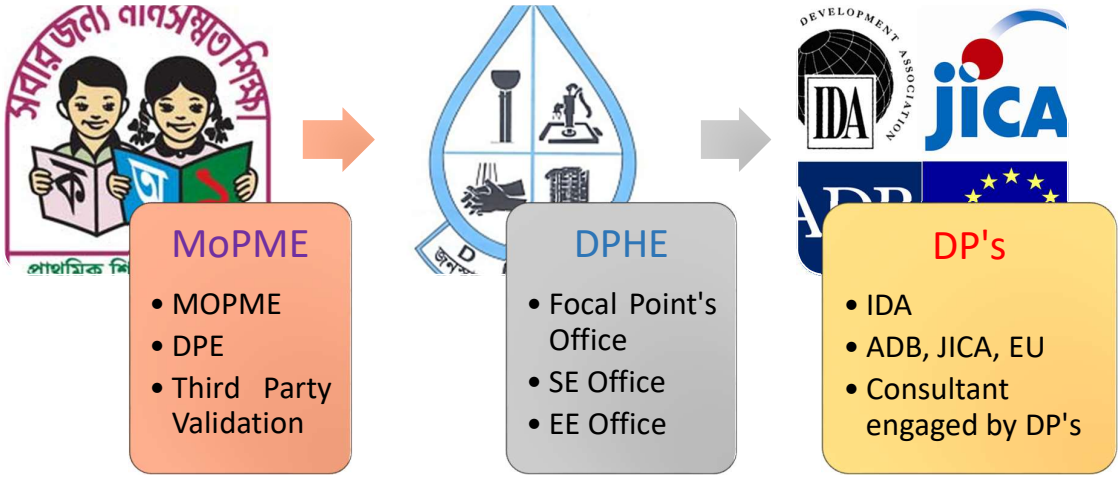

Fig. 2 Monitoring scheme in PEDP-4

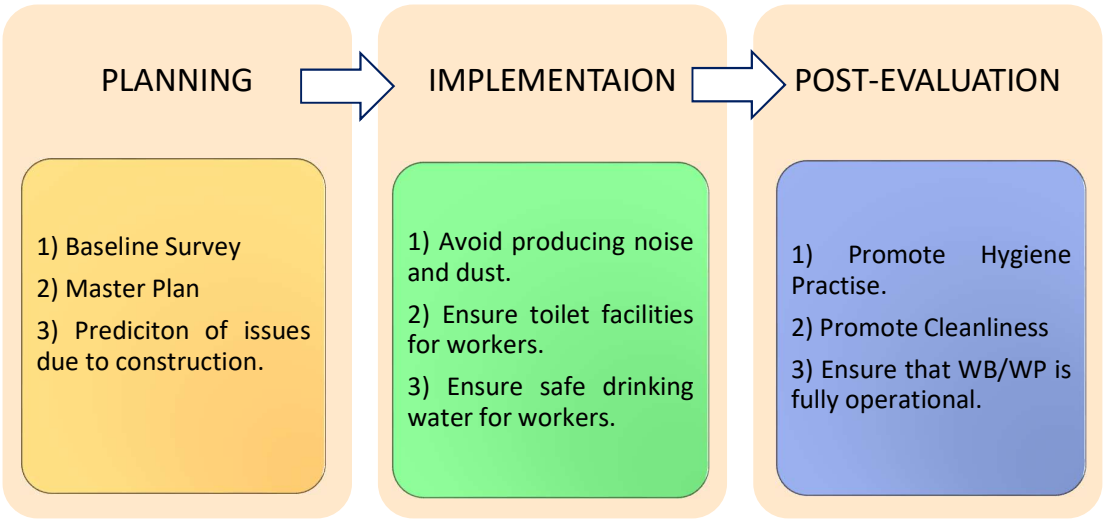

Fig. 3 Role of DPHE in environmental monitoring

DPHE district office arranges coordination meeting between DPHE (EE, AE, and SAE) and DPE officials (DPEO, UEO) in every 3 months. A glimpse of such meeting is shown in Fig. 4. In this meeting, officers from directorate of primary education point out the necessity of monitoring of particular school which are immediately addressed by DPHE officials. Besides these, to get better insight and ensure quick action, DPHE has introduced a new system of arranging monthly meeting between DPHE officials and Headmasters of Primary School during this reporting tenure as a part of routine monitoring process. Photo of such meeting is depicted in Fig.5. Recently, DPE started an initiative known as 'Divisional Co-ordination Meeting' where officials from DPE, DPHE and LGED attend. This arrangement has been proven to be an efficient monitoring tool in mitigating construction related issues. A photo of such meeting is depicted in Fig. 6 where DG, DPE is chairing a co-ordination meeting at Rangpur division.

DPHE arranges caretaker training and provides MoPME approved 'Maintenance Manual' to the concerned schools during the handover of water points and wash blocks which covers post-construction issues. Contact numbers of DPHE officials (mechanics and assistant/sub-assistant engineers) are provided to the concerned schools so that any relevant issues can be addressed accordingly. Moreover, DPHE looks after the tube wells which have already passed the defect liability period of 02 (two) years. Mechanics of DPHE upazila headquarters repair the tube wells on an urgent basis when they are called for doing so by the concerned school in order to ensure that the running water supply is fully operational.

Fig. 4 Co-ordination meeting between DPE & DPHE Officials at Gazipur district

Fig. 5 Co-ordination meeting between AE/SAE, DPHE and Head Teachers

Fig. 6 Divisional Co-ordination Meeting at Rangpur Division chaired by DG, DPE

6. Capacity building

During the implementation of PEDP-3, a ToT (Training of the Trainers) was conducted by the World Bank among DPE, DPHE and LGED officials. The purpose was to introduce the proposed framework for environmental and social safeguard under PEDP-3 along with the importance of conducting rigorous monitoring. In addition, screening method was agreed and confirmed based on targeted outcomes. DPHE officials (Executive Engineers, Senior Assistant Engineers, and Assistant Engineers) who received ToT provided training to the sub-assistant engineers and mechanics in the district and upazilla level who eventually filled in the environmental screening forms at the grass root level. In PEDP-4, a revised framework is adopted for both environmental and social safeguards. The basic changes are little but elaborate in comparison to that of PEDP-3. On December 5, 2021, ADB conducted a short virtual training workshop on Occupational, Community, and COVID-19 Health and Safety Management at the Construction works. Officials, consultants, and contractors of both DPHE and LGED attended the training workshop. Although the duration of the training was short, it was effective and guided the participants with valuable insights related to construction safety and COVID-19 health and safety management at the construction site.

On May 31, 2022, a meeting on the revision of the latest EMF and SMF was held virtually. The meeting was arranged by DPE and presided over by ADG (PEDP4), DPE. Members from DP's consortium and government officials attended the meeting. The meeting came up with several modification decisions on the existing EMF and SMF which is expected to be included in the revised EMF and SMF. In order to identify the key differences of revised EMF and SMF to that of original EMF and SMF of PEDP-3, newly designed training should be carried out by the experts (from both GoB and DP's) who had inputs during the preparation of revised EMF and SMF. Recently importance of training of the trainees were discussed in a meeting regarding EMF and SMF. Recently (December 8, 2022), during the QLEAP mission importance of training of the trainees were discussed. It was decided that the existing environmental and social safeguard framework will be revised with an agreed setup by DPE and TA support from the development partners.

During the reporting tenure, DPHE master trainers from Head Quarter and circle Head Quarter (who received ToT during PEDP-3) conducted day long circle level meetings to expedite the works related to the construction of wash blocks and installation of water sources and for the smooth implementation of construction work by adhering the guidelines of both revised EMF and SMF. Thus, the trained engineers try and function as peer educators to educate the site workers and contractors. A

summary of training and capacity-building activities during the reporting tenure is tabulated below. Participant attendance sheet and photo of the capacity building program are shown in Appendix 8.

Table 1 Training and capacity building activities during January/2023-June/2023

Training Title	Date	Venue	Training Details	No. of Participants	
				Male	Female
Supervision and Construction Quality Control under PEDP4/GPS/NNGPS Project	01/04/2023	DPHE Chittagong Division office	Training on on-job issues such as Civil / Water Supply / Sanitary / Plumbing related issues in accordance with revised EMF, SMF	28	10
	15/04/2023	DPHE Sylhet Division office		20	8
	27/04/2023	DPHE Rangpur Division office		26	9
	02/05/2023	DPHE Dhaka Division office		21	11
	1505/2023	DPHE Khulna Division office.		35	12
	20/05/2023	DPHE Rajshahi Division office.		31	15
			Total =	161	65
Cumulative Number of Training from the beginning of the project till date =				46	

7. Environmental safeguard screening by DPHE (Jan'2023 – June'2023)

It cannot be denied that COVID-19 situation slowed down the overall construction and implementation progress. But with restrictions being lessened, DPHE has quickly adapted to the new normal by developing a comprehensive COVID-19 Site Operating Procedure (SOP) alongside several site and task specific risk assessments. DPHE constructed and installed a total of 19,216 wash blocks and 12,944 water points till date from the beginning of this project. Among these, a total of 5,706 wash blocks and 3,608 water points were installed and handed over during the reporting tenure of January'2023 to June'2023. Needless to note that, the water points which are installed for drinking water purposes are tested in DPHE zonal laboratories for different chemical (Arsenic, Iron and Chloride) contamination. In addition, DPHE finished the routine monitoring of 30,921 water points (installed in PEDP-3) out of 40,000 water points by field arsenic test kit and currently undertaking the monitoring of the rest 9,079 water points for arsenic contamination. In this tenure, 15,921 water points

Table 2 Progress of work under PEDP-4, DPHE

Scope of Work	FY 19-20	FY 20-21	FY 21-22	July'22-Dec'22	Jan'23-June'23	Total
Construction of Wash Block	-	6,760	4,722	2,028	5,706	19,216
Installation of Water Sources	240	4,401	3,027	1,668	3,608	12,944
Maintenance of Wash Block	689	4,010	1,663	790	240	7,392
Water Quality Monitoring	-	-	15,000	-	15,921	30,921

were tested by field arsenic kit in order to identify any new contamination of water sources due to arsenic. All these works were monitored based on the approved Environmental Monitoring Framework (EMF) for PEDP-4. Table-2 summarizes the list of DPHE-implemented works where screening for environmental safeguards was carried out.

This report focuses on the construction work from the tenure of January'2023 to June'2023. During this period, not only new wash blocks were constructed and water points were installed, major maintenance of 240 wash blocks which were constructed during PEDP-3 was carried out. Furthermore, monitoring of 25,000 water points installed during PEDP-3 was undertaken for arsenic contamination screening, of which 15,921 were completed and the rest 9,079 are under testing. The status of the water points and wash blocks received through the monitoring survey is given in the following subsections. A list of random monitoring visits from the DPHE Head Quarter is listed in the Table below. Field Monitoring Photos are shown in Appendix 9.

Table 3 Monitoring visits from DPHE Head Quarter by Consultants during the reporting period

Sl. No.	Name of subproject	Location	No. of WB/WS	Date of Inspection
1	Construction of Wash Block (WB)	Khulna	34	28/03/2023-30/03/2023
2	Installation of Water Supply (WS)	Rangpur	26	25/04/2023 - 27/04/2023
3	Construction of Wash Block (WB)	Barishal	35	26/04/2023 - 27/04/2023
4	Construction of Wash Block (WB)	Mymensingh	18	08/05/2023 - 10/05/2023
5	Installation of Water Supply (WS)	Pirojpur	26	17/05/2023 - 18/05/2023
6	Construction of Wash Block (WB)	Rajshahi	20	22/05/2023 - 23/05/2023
7	Installation of Water Supply (WS)	Sylhet	25	23/05/2023 - 25/05/2023
8	Construction of Wash Block (WB)	Chittagong	45	04/06/2023 – 07/06/2023
9	Construction of Wash Block (WB)	Panchagar	23	05/06/2023 – 08/06/2023

** *In addition, frequent monitoring visit from respective EE Office and AE/SAE offices happen during the reporting tenure.*

8. Outcomes of environmental safeguard screening

8.1 Influence of type of water point

Planning from the lessons learned in PEDP-3

It is a fact that DPHE installed water points of different options such as Deep Tube Wells (DTW), Shallow Tube Wells (STW), Tara Tube well, Ring Wells (RW), Pond Sand Filters (PSF), Rain Water Harvesting (RHW) in PEDP-3 based on the variation in the geological formation, position of aquifer /water table, saline water intrusion, etc. However, all those options have certain advantages as well as multiple drawbacks. The common of which is the ease of availability of water from the source and their familiarization and user-friendliness to the young users.

Mitigation Measures Suggested (MMS):

In order to mitigate the concerns and to make the water sources more popular and user friendly, DPHE installed Tube well with Submersible Pump (TSP) in the primary schools where deep tube well

(depth >200m) is required to be installed under PEDP-4 due to ground geology. This option has special features such as-

- Running water supply with storage facility.
- Multiple users can access at the same time.
- Promote hygiene practice through safe hand washing.

Comment:

Installation of tube well with submersible pump added values to its user especially young user which eventually *increases the easy access to safe drinking water result in health benefit* as well as diminishes water logging and drainage problem.

8.2 Distribution of water points based on installed depth

DPHE installed tube wells of varying depth in different primary schools of Bangladesh considering the geological formation of respective district/upazilla. Although the depth of tube well depends on the suitable water layer, all the tube wells installed in the reporting tenure can be broadly categorized into five distinct types based on the depth of tube well. Fig.7 depicts the classification of tube wells based on depth. As shown in Table 2, a total of 3,608 nos. of water points were installed under PEDP-4 during the reporting tenure. It is clear from Fig.7 that 45% tube wells were installed at a greater depth of 275m or more which is considered as deep tube well. Around 17% tube wells were installed in shallow depth (<65m). Tube wells installed in between 65m to 275m are also deep tube wells and this percentage is second highest (38%) amongst all the installed water points.

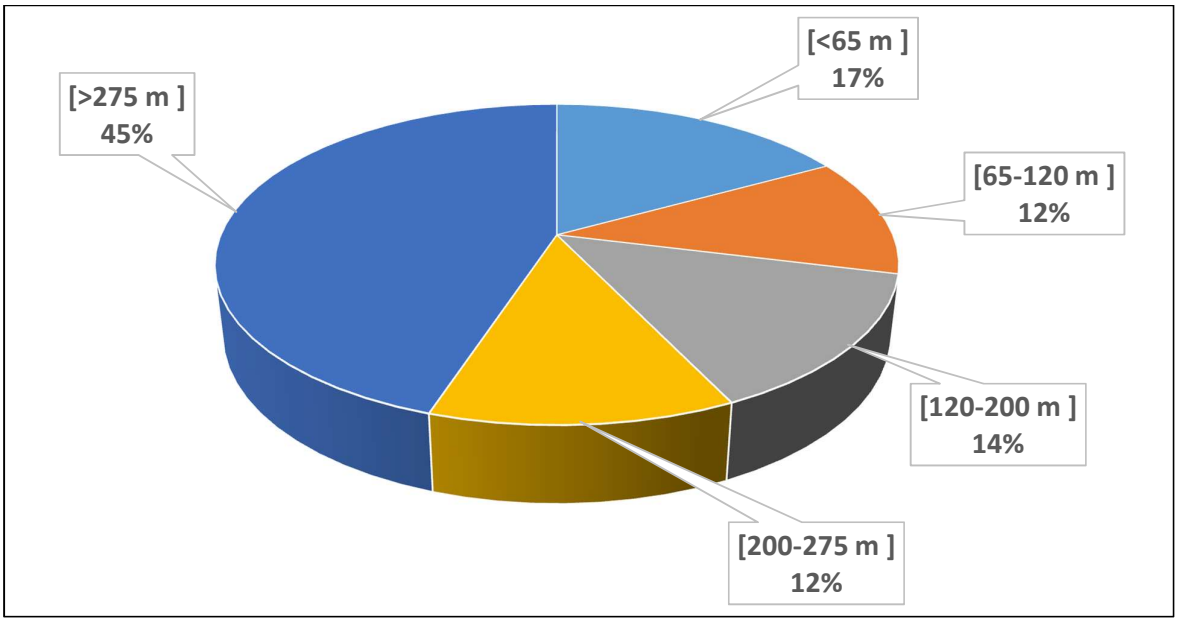

Fig. 7 Distribution of Water Points based on Depth of Boring

8.3 Countrywide distribution of water sources & wash blocks

Countrywide distribution of water sources and wash blocks were analyzed and division wise categorization for water sources and wash blocks is depicted in Figs. 8 and 9 respectively. It is fact that, tube well ensures safe drinking water for the school children as well as for the teachers. Fig. 8 shows the equity in distribution of water sources. Among the total installed water points, the highest number was installed in the Chattogram division followed by Rajshahi and Sylhet division while the minimum number of water points was installed in the Mymensingh division. This is as per the need assessment criteria and the approved list issued by DPE based on approved IPG.

Wash Block is serving as a unique unit of hygiene practice for the school children as well as for teachers. Its impact on the environment is high as it helps to promote hygiene as well as a safe and clean school environment. Open defecations and urination practices decrease through the utilization of wash blocks and they confirm better health through improved washing facilities. Fig. 9 reflects the countrywide distribution of wash blocks depending on the number of districts and upazillas in each division. The maximum number of wash blocks were constructed in the Chattogram, Dhaka, Rangpur, and Khulna divisions as these divisions cover the maximum districts. The lowest number of wash blocks (1480) was constructed in the Mymensingh division as it is the smallest division of Bangladesh and thus, equity in distribution is justified.

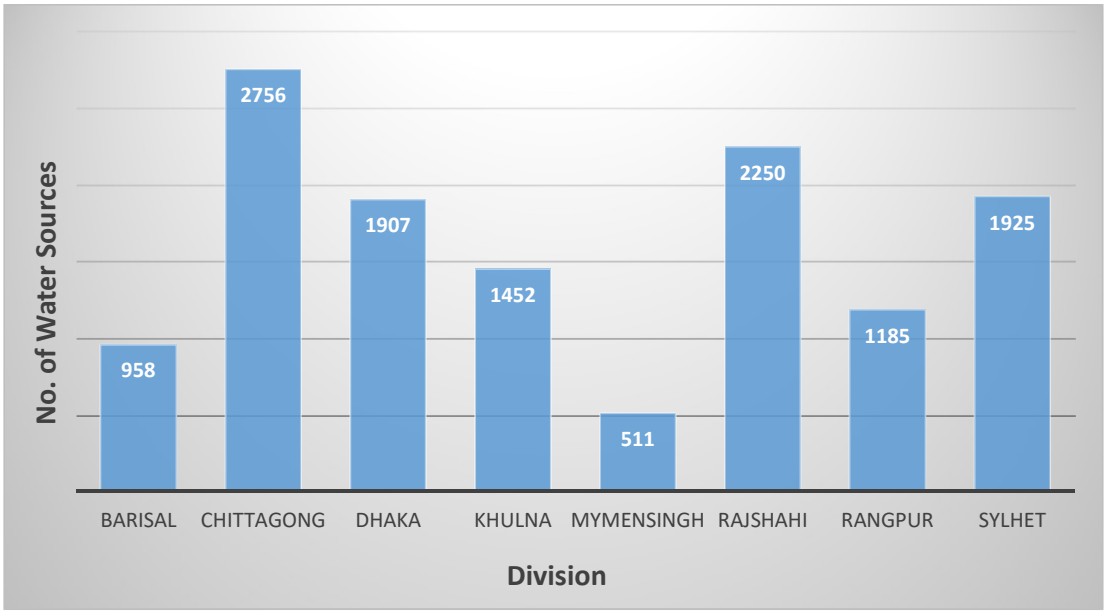

Fig. 8 Countrywide distribution of Water Sources

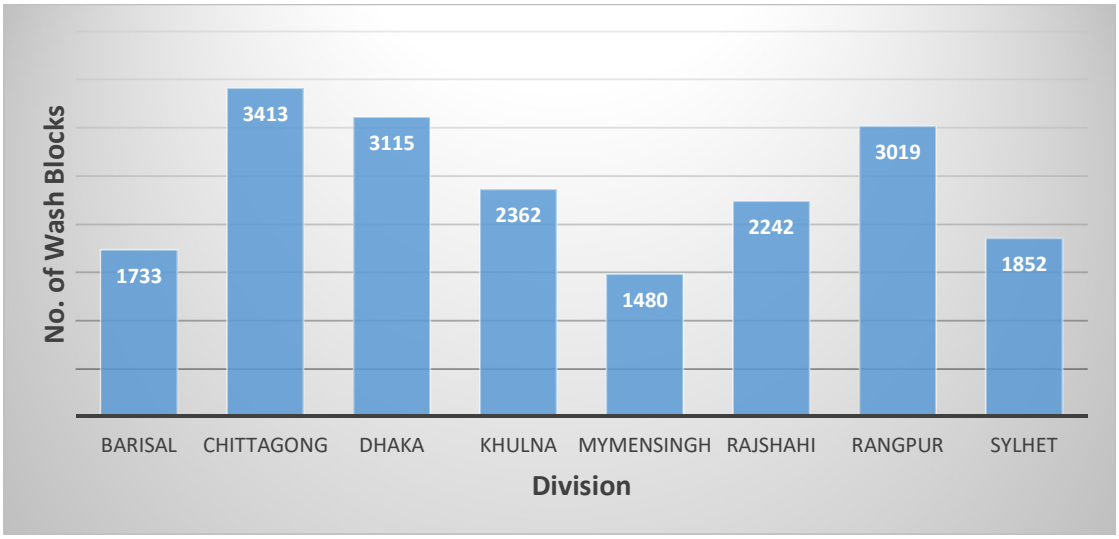

Fig. 9 Countrywide distribution of Wash Blocks

8.4 Loss of agricultural land

During the preparation of site plan/ master plan it was the prime focus that the installation of the new water sources does not preclude the use of existing agricultural lands. No loss of agricultural lands was recorded from the environmental screening survey conducted for the water points installed from Jan'23 to June'23. Similarly, construction of wash blocks was carried out in those schools where land is owned by the respective school. Furthermore, prior to the construction of either wash block or installation of water sources, it was confirmed that the master plan was prepared by the MoMPE approved committee. In some cases, (approximately less than 1% of total construction) design and arrangement of wash blocks were modified based on the prevailing space constraints in the school by keeping the floor area similar. *However, the overall process of construction of wash block did not require purchase of new land from school which ensured no loss of agricultural land.*

8.5 Environment of water supply facility

In case of water points 'Clean Environment' refers to the surrounding of the installed water option. If the surrounding environment is not dirty and/or not covered with algae, then it is referred to as 'Clean'. Post installation monitoring of all water points have been conducted. Clean environment was found in 97.3% of the total water points. It can be noted that due to the provision of basin type water points, water logging and or other problems related to dirty environment have been dramatically reduced than that observed during the environmental screening of other types of tube well installed in PEDP-3 program.

Mitigation Measures Suggested (MMS):

During the monitoring phase, mitigation measures were suggested to the concerned school such as cleaning of basin, removal of leaves and other utensils that causes blockage of the drains etc. Because of taking mitigation measures along with caretakers' training during commissioning and trial run and routine maintenance during monitoring phase, environment of water supply facility improves to 100% from 97.3%.

8.6 Surface Water Pollution:

Both the water sources and wash blocks were installed in such a manner that they do not adversely pollute the surface water. The environmental screening of all 5,706 Wash blocks and 3,608 Water Points installed from Jan'23 up to June'23 revealed no instances of polluting the surrounding water bodies.

8.7 Facilities for draining out of water

From the lessons learned during the environmental screening in PEDP-3, DPHE took the initiative in solving the water logging problem by adopting different measures such as:

1) Pipe out used water to the existing drains (if any).
2) Use of 5-ring soaks well to drain out basin water where the surface drain is absent.
3) Construction of 5 user water collection basin having 50mm dia. PVC washout pipe. Fig. 10 Shows a newly constructed 5-outlet hand washing basin under PEDP-4.

Fig. 10 Five Outlet Water Collection Basin

Because, DPHE local office took the initiative in solving the drainage issue, it has been observed that the water logging problem is insignificant compared to that in PEDP-3. However, it is revealed that out of 3,608 water sources about 1.42% had the problem of water logging. The reasons observed are mainly lack of cleanliness which created blockage of drainage pipe by wastes like paper, tree leaves, mud, etc. It is hence suggested that SMC needs to look after this issue and run a regular cleanliness program in the water collection basins and drains.

8.8 Source of Existing Water Supply

During preliminary survey it was found that, out of 3,608 schools 81% did not have their own active water option. 49% of them used the facility of their neighborhood. Though 19% schools have their own tube wells, yet those tube wells were found as non-functional or did not provide sufficient water during dry season. From this information during the preliminary screening, DPHE took initiative in solving the above problem by installing new tube wells (approved list of which schools were duly provided by DPE) with submersible pump but at different depth as appropriate to the site geology.

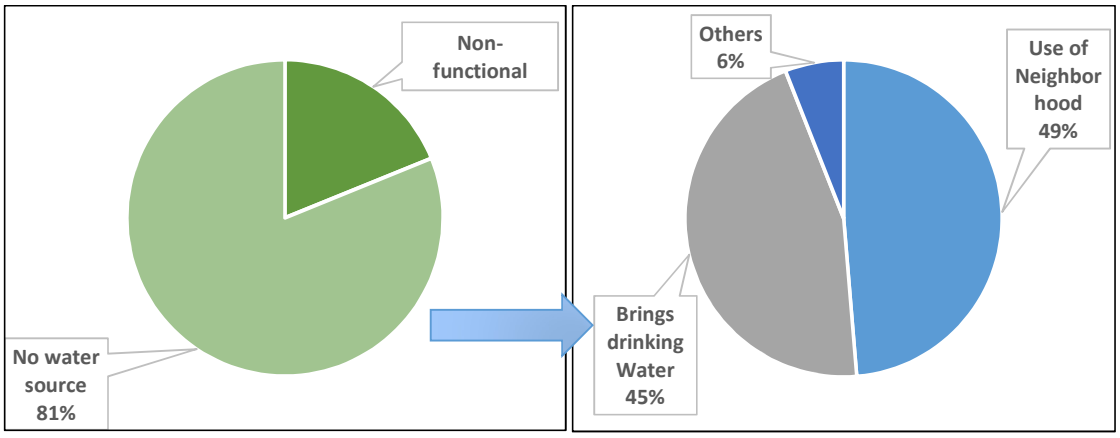

Fig. 11 Assessment of schools prior to the installation of new water sources

8.9 Water Quality test in Laboratory

Water testing facilities in DPHE zonal laboratory:

It is fact that DPHE has a permanent set up of 13 laboratory buildings including a central laboratory at Mahakhali, Dhaka. Recently, DPHE completed the set-up of 52 laboratory buildings in 52 districts which confirmed the establishment of zonal laboratories in all districts to expedite the water quality monitoring. These newly established laboratories are equipped with modern machinery so that all relevant water quality parameters can be monitored.

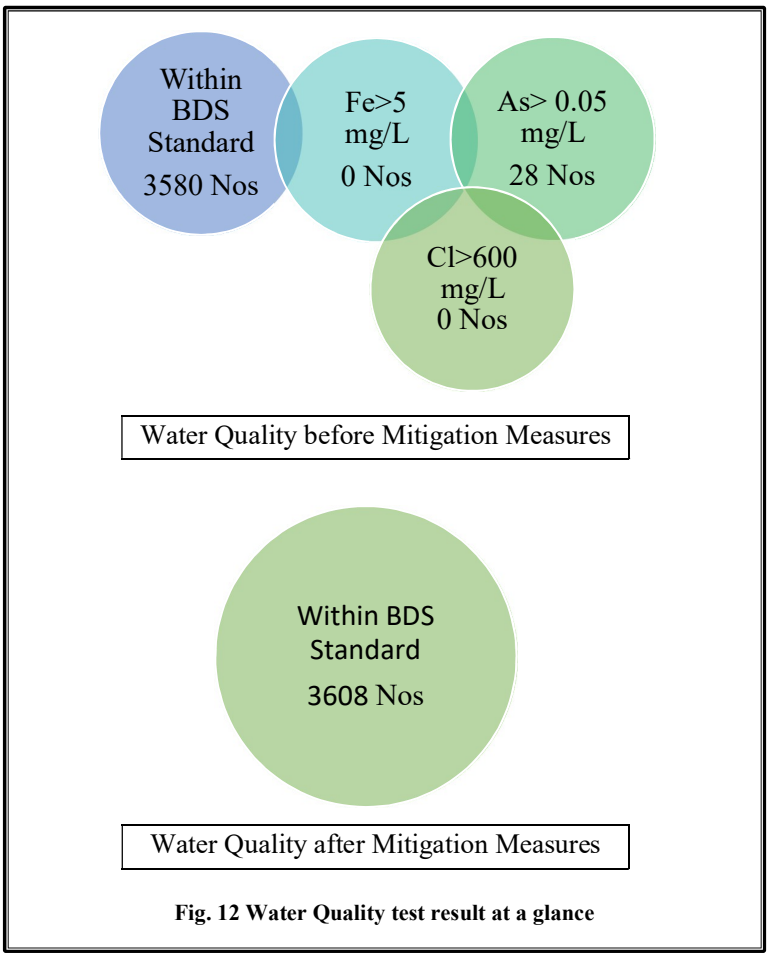

Fig. 12 Water Quality test result at a glance

It can be noted that water samples of all the installed water sources (3,608) were taken by lab technicians during the reporting tenure and water was tested for different chemical and physical contamination such as arsenic (As), Chloride (Cl) and Iron (Fe). The water quality test results are shown in Fig. 12. A sample copy of the water test result is provided in Appendix-3. It can be seen from Fig. 12 that a total of 28 water sources were found to have high arsenic concentration water. 07 of which are located in Jhenaidah and the rest 21 are located in Sunamganj district. The water quality test report for all 28 unacceptable water sources is shown in Appendix-6. A summary of the water quality monitoring report is provided in Table 4.

Table 4 Summary of Water Quality Monitoring Result

Sl. No.	District	Water Quality not Satisfactory				Remarks
		Fe > 5mg/L	Cl > 600mg/L	As > 0.05mg/L	Total	
1.	**Jhenaidah**	**0**	**0**	**07**	**07**	List of 'Not Satisfactory' water sources are given in Appendix-6 and Actions taken for the water sources where water quality is not satisfactory are listed in Table 1 of Appendix-6.
2.	**Sunamganj**	**0**	**0**	**21**	**21**	
Total =		**0**	**0**	**28**	**28**	

** 28 water sources have been found to be contaminated with Arsenic [For details please refer to Appendix 6].*

In cases where arsenic/iron/chloride is found beyond allowable BDS standard in installed water sources, DPHE adopts other approved alternate water options. DPHE goes for options like deep tube well of greater depth, ring well, pond sand filter, rain water harvesting, Reverse Osmosis Filter, AIRP, Small box type AIRP etc. whichever is feasible. In some cases, if all the options in hand fails, i.e., boring in greater depth becomes impossible, arsenic is found even in deep tube well and none other option is feasible, DPHE has started implementing 'SONO Filter' as well. DPHE upazilla offices will arrange and install the said filter in those water sources whichever is feasible, convenient, and justified. In addition, water from those sources will be further tested and declared safe if found well below the BDS standard of drinking water. Fig. 13 shows some of the suggested filtration technologies.

It is fact that, in the reporting tenure a total of 28 water sources were found to have water quality concerns with excessive arsenic. For all the said 28 water points, ***Reverse Osmosis (RO)*** *were installed and filtered water was tested in DPHE zonal Laboratories. The water sources were handed over to the respective schools once the water quality results were found satisfactory. Water quality test results are summarized in Table 1 of Appendix 6.*

Fig. 13 Different Suggested Improved Filtration Technologies

8.10 Routine Water Quality Monitoring

As per MoU signed in between DPE and DPHE in September 15, 2019, DPHE will conduct water quality monitoring of 65,000 water points installed earlier in PEDP-3 with an aim to provide arsenic free safe drinking water in the primary schools of Bangladesh. It has been decided that 90% of the tests will be conducted in field by utilizing field test kits for arsenic and the rest 10% will be conducted in DPHE zonal laboratory. In this respect, DPHE received two sperate list of 40,000 (15,000+25,000) water points from DPE for water quality monitoring. Due to COVID-19 pandemic, schools were closed which is why the field tests could not be conducted in the financial year 2020-2021. However, all the test kits were bought and well preserved by DPHE in order to conduct the field tests as soon as the schools re-open.

Soon after the reopening of the schools, steps were taken to conduct water quality screening. In the first phase water quality screening of 15,000 water points was completed. The results were reported in the previous EMR. It was found that out of 15,000 water points, 1.44% had new arsenic contamination. In addition, it was confirmed that water from 98.56% of 15,000 installed tube wells in PEDP-3 is drinkable. DPHE officials immediately took steps in stopping the water intake from the contaminated water points. In the second phase, water quality screening of 25,000 water points has started. Of them 15,921 were completed to date and the rest 9,079 are currently under testing. The detailed results are expected to be presented in the next EMR.

8.11 Hand washing facility and Hygiene Promotion

Prior to the installation of water sources, hand washing of students before and after meals especially mid-day meal and after using the toilet was a matter of concern. As a result, students were more susceptible to diseases which triggered the absence of students from school. Besides these, newly constructed wash blocks with modern interior facilities will surely create enthusiasm among children for the best utilization of wash blocks. A glimpse of wash block facilities is shown in Fig 14.

Mitigation Measures Suggested (MMS):

Working with the motto of 'clean hand, safe hand' DPHE confirmed the installation of tube wells with running water supply by the provision of submersible pumps in all the above-mentioned schools during the reporting tenure. The construction of a wash basin for hand washing (Fig.9) ensured total hand washing facilities in the school. Due to the global pandemic situation, although regular hygiene promotion activities could not be conducted yet monthly coordination meeting with DPE officials, TEO, ATEO, and Primary School Headmasters is an indication of the intensity of preparation for hygiene activities.

Fig. 14 Modern Interior of Wash Blocks

8.12 COVID-19 Reality, School Re-Opening, and New Normal

Countries all over the world are trying new ways of softening or partially lifting COVID-19 related restrictions while keeping the virus progression in check. In this challenging time, the future of education depends on the provision of water, sanitation and hygiene services. So, Hygiene Promotion has been emerged as an issue of particular concern when considering reopening of schools.

In order to confirm adequate hygiene practise, DPHE district and upazilla level officers monthly conduct sessions related to hygiene promotion activities with TEO, ATEO and Primary School Headmasters in the schools or DPHE district offices. All these activities put positive sign to the improvement of total environment. Prior to the re-opening of the schools DPHE district offices and Upazilla offices conducted disinfection of school premises and maintenance of wash blocks and water sources as and where required. Besides these all the construction activities regarding construction of wash blocks, maintenance of wash blocks and installation of water sources are constructed following the guidelines by Ministry of Local Government, Rural Development and Cooperatives

8.13 Miscellaneous observations

During the implementation phase, two basic standards for water sources were maintained.

1) Ensure at least a distance of 10m between water points and leach pit/soak well/ septic tank etc.
2) Ensure that the water collection basin is not clogged by paper, dry leaves, mud etc.

During monitoring phase, these options were found to be maintained properly.

8.14 Summary of observations

The post installation monitoring of all 5,706 Wash Blocks and 3,608 water points confirmed no major concern or significant issues that can cause adverse environmental impact. Table 5 summarizes some other environmental issues observed during survey of Water points/ Wash Blocks.

Table 5 Important environmental issues observed

Issues/Environment Criteria	Findings from the Survey for all TWs	Findings from the Survey for all WBs
Is the TW installed?	Yes	Yes
Is the existing TW working?	Yes	Yes
Was the installed TW water tested?	Yes	Yes
Is Arsenic < 50 ppb?	Yes	Yes
Is Iron <1mg/l, for iron prone area up to 5 mg/l [Based on Water Quality Monitoring and Surveillance Protocol for Running	Yes	Yes

Issues/Environment Criteria	Findings from the Survey for all TWs	Findings from the Survey for all WBs
Water Supply System in Bangladesh by DPHE, Appendix-8]		
Is Cl ≤ 600 mg/l, for coastal areas up to 1000 mg/l [Based on Water Quality Monitoring and Surveillance Protocol for Running Water Supply System in Bangladesh by DPHE, Appendix-8]	Yes	Yes
Loss of agricultural land?	No	No
Negative effect on flora/fauna?	No	No
Conflicts with water supply, right?	No	No
Any potential health risks?	No	No
Is there a provision for separate toilets for males and females?	N/A	Yes
Is there provision for adequate ventilation?	N/A	Yes
Is there a provision for disabled children?	N/A	Yes

Note: Only the particular water source that met the drinking water quality in the laboratory test is handed over to the primary school authority. DPHE preserves all the testing reports.

8.15 Positive environmental impact

The outcomes of the environmental screening as discussed in the previous subsections pointed out the achievement of following positive impacts through the implementation of revised EMF and SMF during the construction works under PEDP-4.

1) Regular WASH-related programs such as hygiene promotion through hand washing campaigns not only increased the personal safety of students but also spread the positive vibe in the surrounding society which is now the key lesson for the inhabitants to fight against COVID-19.
2) Through the assurance of contamination-free safe water sources in the said primary schools during the reporting tenure, a long-awaited demand was fulfilled which not only improved the health potential of users but also reduced the dropout rate.
3) Lessons learned from PEDP-3 helped in designing the type and structure of water sources with the provision of running water free from bacteriological contamination. This initiative dramatically reduced the problem of water logging and drainage which was encountered in PEDP-3.

A summary status of the environmental safeguard document is given in Table 6 while overall performance in relation to environmental compliance is given in Table 7.

Table 6 Summary Status of Environmental Safeguard Documents

Type of safeguard document	Agency	Latest version	Coverage
Semi Annual Environmental Monitoring Report	DPHE	June/2022	January – June/2023
Maintenance Manual for Septic Tank	DPHE	October/2022	Till Date
National Standards of Water, Sanitation and Hygiene for Schools in Bangladesh	UNICEF	January/2011	Till Date
National Strategy for Water Supply and Sanitation	MoLGRD	June/2021	Till Date
Response to Covid-19 Outbreak Through Water, Sanitation and Hygiene Interventions	MoLGRD	June/2020	July/2020-December/2023
COVID-19 Exposure Prevention, Preparedness & Response Plan	DPHE	December/2020	Project Tenure
Site specific Environmental Management Plan (SEMP)	DPHE	December/2019	Project Tenure
Complain and sick register report	DPHE	December/2021	Project Tenure
OHS Plan	DPHE	December/2019	Project Tenure
Overall monitoring checklist	DPHE	December/2019	Project Tenure
Environment test report: included environmental monitoring, checklist, HSE monitoring	DPHE	December/2019	Project Tenure
National Menstrual Hygiene Management Strategy 2021	MoLGRD	June/2020	Till Date

Table 7 Overall performance in relation to environmental compliance

No.	Aspects of Environmental issues	Compliance Status			Remarks
		FC	PC	NC	
A.	**General**				
1.	Legal working hours approval	✓			
2.	Employment Record keeping arrangement	✓			
3.	Payment Record keeping arrangement	✓			
4.	Environment, Health and Safety Officer designated	✓			Recently recruited
5.	Provision for monthly meeting for inspection of site activities	✓			
B.	**Health and Sanitation**				
Occupational Health					
1.	First-Aid Box availability at work sites	✓			
2.	Provision of personal protection equipment's (PPEs)		✓		In some instances, it is difficult to avoid situations like use of mixture machine, vibrator machine etc. during construction
3.	Handling of cement and other hazardous materials by workers	✓			
4.	Workers' complains taken care of by the supervisor	✓			
5.	Children below 18 employment (Not employed)	✓			
C.	**Environmental Pollution**				
Dust and emission control					
1.	Construction vehicles and machinery are maintained properly to reduce emissions	✓			
2.	Proper storage of materials and regular watering.	✓			
Noise Pollution					
1.	Movement of vehicles at desired hours	✓			
2.	Noise control measures at sites	✓			
Water Pollution					

No.	Aspects of Environmental issues	Compliance Status			Remarks
		FC	PC	NC	
1.	Landfilling	✓			
2.	Wastes, cement, effluents, and junk not disposed of in water	✓			
Flora and Fauna					
1.	Trees and bushes outside the construction area are preserved from damages	✓			
2.	Disturbance to terrestrial fauna minimized	✓			
Waste Management					
1.	Construction wastes are removed off-site regularly	✓			
2.	Chemical wastes, if any, collected and disposed of properly	✓			
D.	**Environmental documents at Field Office and Project sites**				
1.	Field Office possesses copies of EMP, contract documents, and Technical Specifications	✓			
2.	Heavy equipment maintenance records	✓			
	TOTAL =	21	1	0	

The corrected action measures for the Partially Compliant (PC) and Non-Compliant (NC) issues presented in Table 7 are listed in Table-8 below.

Table 8 Corrective Action Plan (Jan/23-June/23)

Sl. No.	Initial Status	Recommended Corrective Action Measures	Responsibility	Due Date
1.	PC	Provision of Personal Protection Equipment (PPEs) at the construction site to be ensured.	Contractors of DPHE	By Dec/2023

9. Grievance redressal status

A comprehensive grievance redressal system has been developed to address any issues generated due to the construction of wash blocks and the installation of water sources in the primary schools. To address such issues, there is a designated GR committee in the DPHE Headquarter, the detail of which is given in Appendix-5. In addition, DG, and DPE issued a letter Vide Memo. 18; dated March 18, 2022, to follow the instructions as stated in the revised SMF. Since no complaints were raised from the concerned community, there was no issue of grievance redressal during the reporting tenure.

10. Monitoring progress report

It is a fact that an environmental screening report is related to the monitoring of the implementation progress of environmental and social management plans. During the planning stage, all possible environmental and social safeguard issues are forecasted and related mitigation plans are included in the related contract packages. Issues related to EMP and SMP are clearly indicated in the 'Particular Conditions of Tender and Contract for Water Sources/ Wash Blocks' which is provided by default as a

part of the tender and contract. The following table shows the monitoring progress report of EMP during the reporting tenure.

Table 9 EMP progress monitoring

Monitoring Criteria	FY-18-19	FY-19-20	FY-20-21	FY 21-22	July'22-Dec'22	Jan'23-June'23	Cumulative	Comment	Compliance Status
No. of contracts that incorporated environmental clause	73/73	28/28	1251/1251	597/597	344/344	284/284	2577 /2577	During tendering, environmental clauses were included which became part of contract	Complied
Funds utilized for addressing safeguards	N/A	N/A	N/A	N/A	N/A	N/A	N/A	Currently, there is no fund provision in RDPP in favor of DPHE for addressing safeguard. However, DPHE has engaged and Environmental and Social Safeguard specialist from its own fund.	N/A
No of schools having dirty environment around water source	6/331	4/240	54/4070	88/3027	18/1668	97/3608	267/12944	Lac of routine cleanliness caused dirty environment which was mitigated in all 267 schools.	Complied
Schools with drainage congestion identified and solved	2/331	2/240	28/4070	16/3027	8/1668	51/3608	107/12944	Blockage in the drainage system caused drainage congestion which was mitigated in all 107 schools.	Complied
No. of water points having problem with quality of water	0/331	8/240	57/4070	66/3027	39/1668	28/5276	198/12944	Alternate option such as RO Filter was used which mitigated the water quality problem in all 198 schools.	Complied

11. Compliance Status to ADB Loan Covenants

The compliance status of ADB loan covenants relevant to environmental safeguards is listed in Table 10.

Table 10 Compliance with ADB Loan Covenants

Serial no. as per Loan Agreement		Program Specific Covenants	Compliance Status	Remarks
Schedule 4	10	To ensure that all program actions in the area of environmental and social safeguards are implemented in a timely and efficient manner	Complied	Semi-Annual environmental and social safeguards are implemented based on revised EMF/SMF.
	11 (a)	To ensure that no construction or rehabilitation works involve significant adverse environmental impacts that may be classified as category A under the SPS through screening.	Complied	Through the comprehensive screening, it was confirmed that no adverse environmental impact as related to category A under the SPS was found.
Schedule 4	11 (b)	To ensure that the preparation, design, construction, implementation, operation, and decommissioning of all activities under the program comply with all applicable laws, regulations, and guidelines related to health and safety, and environmental safeguard.	Complied	The applicable laws, regulations, and guidelines related to the H&S and Environmental safeguard were strictly adhered.
	12	To ensure that the program does not involve any resettlement risks.	Complied	No resettlement risks were involved since the construction of wash blocks and water sources was conducted in the location owned by the primary schools.
	13	To ensure that the program does not involve any negative risks or impacts on tribes or minor races, ethnic sects, and communities.	Complied	No negative risks or impacts on tribes or minor races, ethnic sects, and communities were reported through the comprehensive environmental and social safeguard screening.

12. Implementation Status of CAP recommended in aide memoire

The implementation status of CAP recommended in the comprehensive aid memoire is listed in Table 11.

Table 11 Implementation Status of CAP recommended in aide memoire

Sl. No.	Recommended Corrective Action Measures [Recommendations were made in Aide memoire]	Implementation Status
1	All tube wells that have been built for more than one year are to be screened annually by DPHE for water quality and physical status of tube wells to ensure fixture damaged/choked up tube wells and where water quality parameters	DPHE completed the screening of 30,921 water points by June/2023 and currently undertaking the screening of another 9,079 water points. Please refer to section 8.10 for details.
2	The mission advised DPHE to take the initiative for water treatment if deep tube wells are found contaminated with arsenic.	As mentioned in Table 4 of section 8.9, 28 water sources were found to have arsenic contamination during the reporting tenure. It can be seen from Table 1 of Appendix 6 that water treatment facilities were provided in those arsenic-contaminated water sources.
3	The mission also advised DPHE to consider soak pits to mitigate water stagnation around the tube well platforms.	As mentioned in section 8.7 (2), 5 ring soak wells were installed to drain out basin water where the surface drain is absent.

13. Conclusions

This study investigates the environmental safeguard concerns during the implementation of wash blocks, water points, and major maintenance of wash blocks based on the approved EMF guidelines for PEDP-4. This report has presented potential environmental impacts associated with the pre-construction, construction, and operation phases of the project. The environmental monitoring screening confirmed ***no significant instances or issues*** that may hamper or influence environmental safety during the reporting tenure. Being an implementing agency DPHE would like to uphold this status in its ongoing and upcoming works related to infrastructure development.

Appendix-1: Sample Environmental Screening for Wash Block

Environmental Screening Format under Primary Education Unit for Wash Block

Name of The Project: Construction of 10 nos R.C.C Wash Block
District: Gopalganj
Upazilla: Muksudpur
Name of School: 07 No Bahirbag GPS
School ID: 317050203
School Type: PEDP-4 Type of Wash Block: Case-1

Screening Questions	Base Line	Impact without Intervention	Impact during Implementation		Impact after Implementation		Remarks
	Yes/No	0/+/-/N/A	0/+/-/N/A	Date of Visit	0/+/-/N/A	Date of Visit	
Environment of Existing Facility Good?	Yes	N/A	N/A		N/A		
Facilities for Draining out of Water Proper?	Yes	N/A	N/A		N/A		
Any Reported Event of Spread of Pathogens?	No	N/A	N/A		N/A		
No of Existing Toilet Adequate?	Yes	N/A	N/A		N/A		
Disposal of faecal waste safe?	Yes	N/A	N/A		N/A		
Disposal of liquid waste safe?	Yes	N/A	N/A		N/A		
Availability of Hand washing Facility?	Yes	N/A	N/A		N/A		
Availability of Foot washing Facility?	Yes	N/A	N/A		N/A		
Availability of Running water Supply?	Yes	N/A	N/A		N/A		
Height of Wash Blocks Appropriate?	Yes	N/A	N/A		N/A		
Any Loss of Agricultural Land?	No	N/A	N/A		N/A		
Any Negative effect on flora/ fauna?	No	N/A	N/A		N/A		
Any provision for disabled?	No	N/A	N/A		N/A		
Is the Wash Block user friendly?	Yes	N/A	N/A		N/A		
Any negative effect on ecosystem?	No	N/A	N/A		N/A		

07.06.23
Signature of SAE
আবুল রহমান শেখ রেহান
উপ-সহকারী প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
মুকসুদপুর উপজেলা: গোপালগঞ্জ।

07.06.23
Signature of AE
মোহাম্মদ লৈয়দ আলী মাতুব্বর
সহকারী প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
মুকসুদপুর উপজেলা, গোপালগঞ্জ।

Signature of Executive Engineer
(মোঃ ফয়েজ আহমেদ)
নির্বাহী প্রকৌশলী, জনস্বাস্থ্যপ্রঃঅঃ
গোপালগঞ্জ জেলা, গোপালগঞ্জ।

Appendix-2: Sample Environmental Screening for Water Sources

Environmental Screening Format under Primary Education Unit for Water Sources

Name of The Project: Construction of 10 nos R.C.C Wash Block
District: Gopalganj
Upazilla: Muksudpur
Name of School: 28 No Khagra danga GPS
School ID: 317050504
School Type: PEDP-4 Type of Wash Block: Case-1

Screening Questions	Base Line	Impact without Intervention	Impact during Implementation		Impact After Implementation		Remarks
	Yes/No	0/+/-/N/A	0/+/-/N/A	Date of Visit	0/+/-/N/A	Date of Visit	
Environment of Water Supply Facility Good?	Yes	N/A	N/A		N/A		
Facilities for Draining out of Water Proper?	Yes	N/A	N/A		N/A		
Any Reported Event of Sickness?	No	N/A	N/A		N/A		
Source of Existing Drinking Water	Yes	N/A	N/A		N/A		
Is the existing TW working?	Yes	N/A	N/A		N/A		
Was the water quality tested?	Yes	N/A	N/A		N/A		
Any concern about Water Quality?	No	N/A	N/A		N/A		
Any Health Risk associated?	No	N/A	N/A		N/A		
Distance of Existing Water Source from Leach Pit > 10m	Yes	N/A	N/A		N/A		
Height & Location of New Water Source Appropriate?	Yes	N/A	N/A		N/A		
Any Loss of Agricultural Land?	No	N/A	N/A		N/A		
Any Negative effect on flora/ fauna?	No	N/A	N/A		N/A		
Any conflicts with Water Supply Right?	No	N/A	N/A		N/A		

07.06.23
Signature of SAE
আব্দুর রহমান শেখ রেহান
উপ-সহকারী প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
মুকসুদপুর উপজেলা গোপালগঞ্জ।

07.06.23
Signature of AE
মোহাম্মদ সৈয়দ আলী মাতুব্বর
সহকারী প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
মুকসুদপুর, গোপালগঞ্জ।

Signature of Executive Engineer
(মোঃ ফয়েজ আহমেদ)
নির্বাহী প্রকৌশলী, জনস্বাস্থ্যপ্রঃঅঃ
গোপালগঞ্জ জেলা, গোপালগঞ্জ।

Appendix-3: Sample water quality monitoring by DPHE zonal Lab

Government of the People's Republic of Bangladesh
Department of Public Health Engineering (DPHE)
Office of the Senior Chemist, Zonal Lab, Sylhet.
Telephone No: 02997700537; e-mail:wqmsc_sylhetzonallab@yahoo.com
Primary Education Development Program (PEDP-4)

Laboratory Test Result

Sl No	District	Upzilla	Village	ID	Type of School	Water Point Type	Depth (m)	Name of School	GPS Latitude	GPS Longitude	Water Quality Sand	Water Quality Clear	Test Result As (mg/L)	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
1	Sunamganj	Jamalganj	Sharifpur	99601060213	1	1		Alipur Asrafpur GPS	25°01'09"	91°12'59"	1	1	0.041	Unit:ml/L
2	Sunamganj	Jamalganj	Bishmupur	91601060111	1	1		Bishmupur GPS	24°48'34"	91°07'45"	1	1	0.048	
3	Sunamganj	Jamalganj	Durgapur	91601060318	1	1		Durgapur GPS	25°03'19"	91°07'41"	1	1	0.042	
4	Sunamganj	Jamalganj	Hauria Alipur	91601060505	1	1		Hauria Alipur GPS	25°01'39"	91°10'11"	1	1	0.037	
5	Sunamganj	Jamalganj	Horerkandi	99601060505	1	1		Horerkandi GPS	24°54'19"	91°16'11"	1	1	0.031	
6	Sunamganj	Jamalganj	Horinagar	91601060110	1	1		Horinagar GPS	25°02'00"	91°13'25"	1	1	0.006	
7	Sunamganj	Jamalganj	Horinakandi	91601060105	1	1		Horinakandi GPS	25°01'56"	91°08'35"	1	1	0.011	
8	Sunamganj	Jamalganj	Hijal	99601060108	1	1		Hijal GPS	25°03'19"	91°07'40"	1	1	0.013	
9	Sunamganj	Jamalganj	Horipur	99601060113	1	1		Horipur GPS	25°03'19"	91°07'41"	1	1	0.021	
10	Sunamganj	Jamalganj	Hugli	99601069009	1	1		Hugli GPS	24°54'24"	91°17'12"	1	1	0.013	RO Filter
11	Sunamganj	Jamalganj	Koloktoka	91601060511	1	1		Koloktoka GPS	24°55'40"	91°17'14"	1	1	0.015	
12	Sunamganj	Jamalganj	Kalipur	99601060507	1	1		Kalipur GPS	24°57'20"	91°16'46"	1	1	0.018	
13	Sunamganj	Jamalganj	Kandagaon	99601069006	1	1		Kandagaon GPS	24°58'23"	91°14'57"	1	1	0.029	
14	Sunamganj	Jamalganj	Mollikpur	90601060512	1	1		Mollikpur GPS	24°54'38"	91°15'54"	1	1	0.022	
15	Sunamganj	Jamalganj	Nidhipur	91601060306	1	1		NidhipurGPS	24°49'13"	91°08'11"	1	1	0.019	
16	Sunamganj	Jamalganj	Sunapur	99601060211	1	1		Sunapur GPS	24°58'05"	91°11'32"	1	1	0.023	
17	Sunamganj	Jamalganj	ukdebpur Josmantp	99601060307	1	1		Sukdebpur Josmantpur GPS	24°52'59"	91°08'45"	1	1	0.011	
18	Sunamganj	Jamalganj	Kaminipur	99601060202	1	1		Kaminipur GPS	24°58'36"	91°11'38"	1	1	0.017	

09.02.2023
Md. Abdul Latif
Sample Analyzer
DPHE Zonal Laboratory Sylhet.

09.02.2023
Dhononjoy Kumar Das
Sample Analyzer
DPHE Zonal Laboratory Sylhet

09.02.'23
Sharmin Sultana
Junior Chemist
DPHE Zonal Laboratory Sylhet.

Appendix-4: Sample water quality monitoring by Field Test Kit

DPE HQ

Government of the People's Republic of Bangladesh
Arsenic Test at School by Field Kit under Water Quality Monitoring of
Fourth Primary Education Development Program (PEDP4)

ARSENIC TEST RESULT BY FIELD KIT

(A) Information of Primary School:

1. Name of School	:	52NO DOKKHIN ALINAGAR GOVT PRIMARY SCHOOL										
2. EMIS Code	:	9	1	5	0	6	0	5	0	1	0	2
3. District	:	BHOLA				4. Upazilla :		BHOLA SADAR				

(B) Information of Drinking Water Source:

1. Provision of Water	:	☑ Yes ☐ No
2. Project	:	☐ PEDP3 ☐ GPS-1 ☐ NNGPS-1 ☑ PEDP-4 ☐ Others
3. Installed By	:	☑ DPHE ☐ Others
4. Year of Installation	:	2002
5. Type of Tube Well	:	☑ Deep ☐ Shallow ☐ Tara ☐ Ring Well ☐ TSP ☐ Others
6. Present Condition	:	☑ Running ☐ Temporary Choked up ☐ Permanently Choked up
7. Platform/Collection Basin Condition	:	☑ Good ☐ Bad ☐ No Platform/Collection Basin.

(C) Water quality & Present status:

Field Observation: (Please √)		Arsenic ppb: 50 mL 0 / 9.6 mL 0 ☑ ; 10 ☐ ; 25 / 75 ☐ ; 50 / 175 ☐ ; 100 / 500 ☐ ; 250 / 1500 ☐ ; 500 / 4000 ☐	
Arsenic test Result	:	.....0.05.....ppb (approx.)	TEST KIT HACH EZ Arsenic Test Kit Cat. No. 28228-00
BDS Standard	:	50 ppb (0.05mg/l)	

For School	For DPHE
Signature & Date: 09/08/2023	Signature & Date: 09/08/23 ; 07.05.23
Name: C	Name: (Hasan)
Designation: মোঃ মিজানুর রহমান, প্রধান শিক্ষক (ভারপ্রাপ্ত), ভোলা সদর, ভোলা।	Designation: (মাসুম বিল্লাহ) উপ-সহকারী প্রকৌশলী, জনস্বাস্থ্য প্রকৌশল অধিদপ্তর, ভোলা সদর, ভোলা।
Phone: 01736392204	Phone:

[এই পরীক্ষার সাথে বিদ্যালয় কর্তৃপক্ষের কোন আর্থিক সংশ্লেষ নেই। আর্সেনিক পরীক্ষার জন্য সকল খরচ ঠিকাদারী প্রতিষ্ঠান কর্তৃক বহন করা হবে।]

Appendix-5: Grievance Redressal Committee of DPHE

অনিক ও আপিল কর্মকর্তা

নাম : জনাব এহতেশামুল রাসেল খান পদবী: তত্ত্বাবধায়ক প্রকৌশলী ফিজিবিরিটি স্টাডি এন্ড ডিজাইন সার্কেল জনস্বাস্থ্য প্রকৌশল অধিদপ্তর, ঢাকা। মোবাইল :+৮৮০১৫৫৬-৩৭৭৩২০ ইমেইলঃ se.fsdc@dphe.gov.bd	অভিযোগ নিস্পত্তি কর্মকর্তা (অনিক)
নাম: জনাব মাহমুদ কবির চৌধুরী পদবী: তত্ত্বাবধায়ক প্রকৌশলী ভান্ডার সার্কেল, ঢাকা ফোনঃ +৮৮ ০২ ৯৩৩০৮০২ মোবাইল :+৮৮ ০১৭১৫০৬১০১৫ ইমেইলঃ se.store@dphe.gov.bd	বিকল্প অভিযোগ নিস্পত্তি কর্মকর্তা (বিকল্প অনিক)
নামঃ মোঃ এমদাদুল হক চৌধুরী পদবিঃ যুগ্মসচিব (পলিসি সাপোর্ট অধিশাখা) ই-মেইলঃ psbr@lgd.gov.bd মোবাইলঃ ০১৭১১১৫২৩২৮ ফোন (অফিস) ০২৫৫১০০৮৭২	আপিল কর্মকর্তা

Appendix-6: Water Quality Report of Unacceptable Water Sources

Sl No	District	Upzilla	Village	ID	Type of Water Point: School	Type of Water Point: Type	Depth (m)	Name of School	GPS: Latitude	GPS: Longitude	Water Quality: Sand	Water Quality: Clear	Test Result: Fe (mg/L)	Test Result: As (mg/L)	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17
21	Sunamgonj	Dharmapasa	Longkapataria	91601070309	1	1		Longkapataria GPS	24°56'34"	91°01'48"	1	1	0.097	0.9	
22	Sunamgonj	Dharmapasa	Noyabando	99601070108	1	1		Noyabando GPS	24°5612"	91°02'32"	1	1	0.091	0.8	
23	Sunamgonj	Dharmapasa	Doshdhari	99601079016	1	1		Gafurnunesa Doshdhari G	24°53'44"	91°01'03"	1	1	0.092	1.8	
24	Sunamgonj	Dharmapasa	Dharampasha	91601070301	1	1		Dharampasha GPS	24°53'57"	91°05'06"	1	1	0.068	0.8	
25	Sunamgonj	Dharmapasa	Nurpur	91601070507	1	1		Nurpur GPS	24°55'22"	91°09'32"	1	1	0.111	1.2	
26	Sunamgonj	Dharmapasa	Bagbari	91601070509	1	1		Bagbari GPS	24°57'23"	91°07'18"	1	1	0.032	0.6	
27	Sunamgonj	Dharmapasa	Digjan	916070504	1	1		Digjan GPS	24°56'05"	91°08'33"	1	1	0.103	1.4	
28	Sunamgonj	Dharmapasa	Patharia kanda	91601070502	1	1		Patharia kanda GPS	24°57'36"	91°08'119	1	1	0.12	3.4	
29	Sunamgonj	Dharmapasa	Berikandi	99601070602	1	1		Berikandi GPS	24°56'16"	91°09'49"	1	1	0.068	0.8	
30	Sunamgonj	Dharmapasa	Nizampur	99601079015	1	1		Nizampur GPS	24°58'34"	90°58'41"	1	1	0.022	0.9	
31	Sunamgonj	Dharmapasa	Maskanda	99601070209	1	1		Maskanda GPS	24°59'12"	91°08'31"	1	1	0.126	1.8	
32	Sunamgonj	Dharmapasa	Raypur	99601070210	1	1		Raypur GPS	24°59'16"	91°02'28"	1	1	0.088	2.8	
33	Sunamgonj	Dharmapasa	Hila	99601079009	1	1		Hila GPS	25°00'33"	91°02'22"	1	1	0.044	1.2	
34	Sunamgonj	Dharmapasa	Doulatpur	99601070802	1	1		Doulatpur GPS	25°02'38"	91°01'16"	1	1	0.111	0.9	
35	Sunamgonj	Dharmapasa	Abidnagar	91601071001	1	1		Abidnagar GPS	25°02'28"	91°02'52"	1	1	0.093	1.4	
36	Sunamgonj	Dharmapasa	Rajapur	91601070601	1	1		Rajapur GPS	24°53'07"	91°06'16"	1	1	0.113	1.3	
37	Sunamgonj	Dharmapasa	Doulatpur	91601070603	1	1		Doulatpur GPS	24°54'44"	91°06'16"	1	1	0.068	3.8	
38	Sunamgonj	Dharmapasa	Joysree Dakshin	99601070410	1	1		Joysree Dakshin GPS	24°54'13"	91°08'12"	1	1	0.023	3.5	
39	Sunamgonj	Dharmapasa	Datiapara	9160107089	1	1		Datiapara GPS	25°09'44"	90°58'32"	1	1	0.061	1.6	
60	Sunamgonj	Dharmapasa	Satur	91601070806	1	1		Satur GPS	25°05'31"	91°02'14"	1	1	0.099	2.2	

29.11.2022
Md. Abdul Latif
Sample Analyzer
DPHE Zonal Laboratory Sylhet

29.11.2022
Dhonenjoy Kumar Das
Sample Analyzer
DPHE Zonal Laboratory Sylhet

29.11.2022
Md. Zahirul Islam Miah
Senior Chemist
DPHE Zonal Laboratory Sylhet.

Government of the People's Republic of Bangladesh
Department of Public Health Engineering (DPHE)
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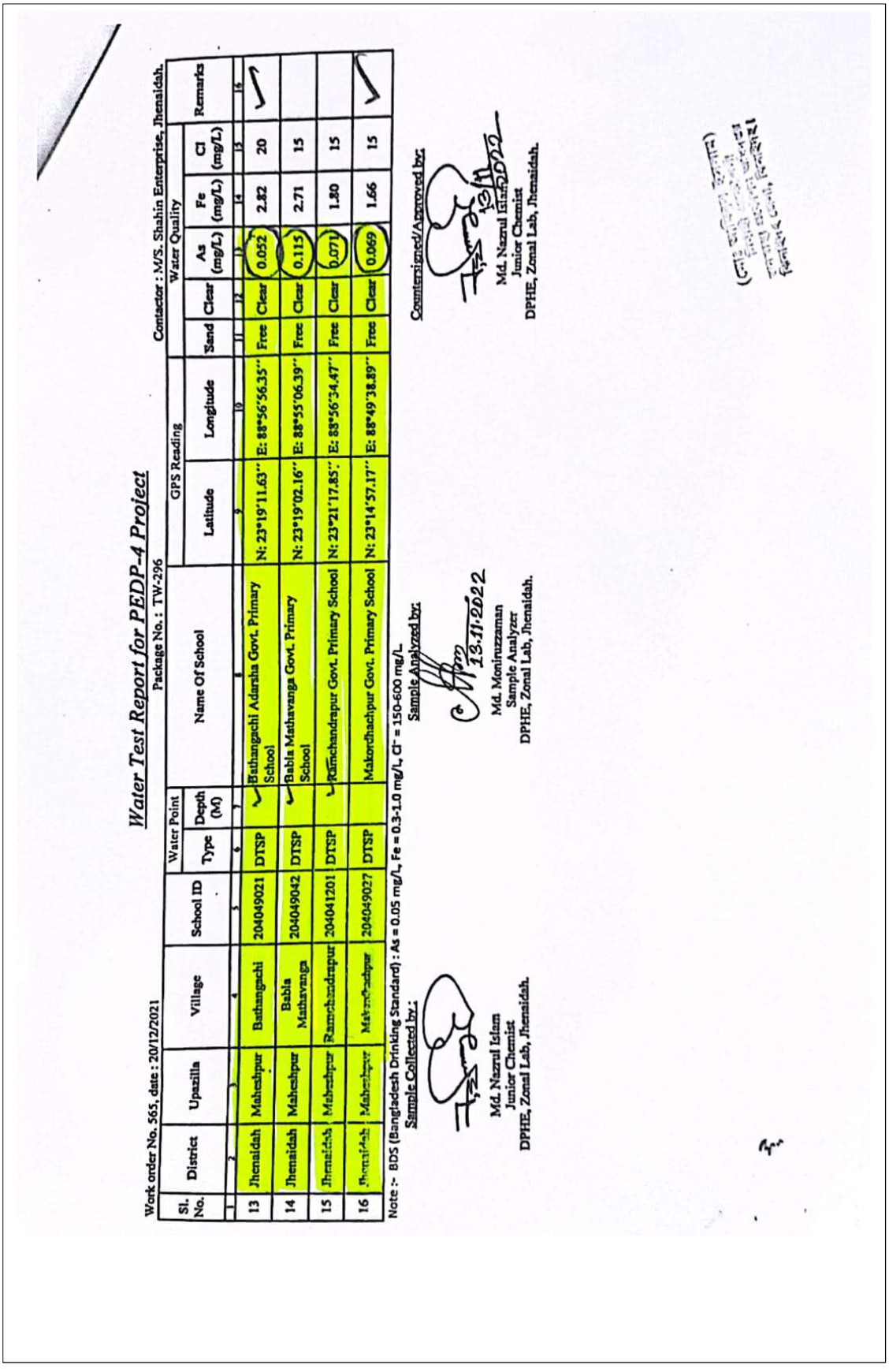
Primary Education Development Program (DEDP-4)

Laboratory Test Result

Sl No	District	Upzilla	Village	ID	ype of School	ater Po Type	Depth (m)	Name of School	GPS Latitude	GPS Longitude	Water Quality Sand	Water Quality Clear	Test Result Fe (mg/L)	Test Result As (mg/L)	Remarks
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	17
1	Sunamgonj	Sulla	Saraspur	99601080210	1	1		Saraspur GPS	24°42'08"	91°20'01"	1	1	1.9	0.031	
2	Sunamgonj	Sulla	Shaskhai	91601080310	1	1		Shaskhai GPS	24°41'49"	91°19'47"	1	1	4.9	0.024	
3	Sunamgonj	Sulla	Chakua	91601080303	1	1		Chakua GPS	24°45'07"	91°16'37"	1	1	2.3	0.061	
4	Sunamgonj	Sulla	Anandapur	91601080302	1	1		Anandapur GPS	24°42'42"	91°16'36"	1	1	1.1	0.033	
5	Sunamgonj	Sulla	Tukchanpur	99601080202	1	1		Darirul Islam Chow GPS	24°42'02"	91°22'28"	1	1	1.4	0.012	
6	Sunamgonj	Sulla	Bhulanagar	99601080214	1	1		Bhulanagar GPS	24°43'12"	91°17'36"	1	1	1.1	0.045	
7	Sunamgonj	Sulla	Narikhala	91601080311	1	1		Narikhala GPS	24°42'25"	91°21'05"	1	1	1.5	0.027	
8	Sunamgonj	Sulla	Noapara	99601080311	1	1		Noapara GPS	24°39'13"	91°18'55"	1	1	3.6	0.046	
9	Sunamgonj	Sulla	Meda	99601080316	1	1		Meda GPS	24°37'24"	91°17'24"	1	1	1.6	0.031	
10	Sunamgonj	Sulla	Pretabpur	91601080203	1	1		Pretabpur GPS	24°39'22"	91°18'57"	1	1	1.3	0.013	
11	Sunamgonj	Sulla	Kasipur	91601050111	1	1		Kasipur GPS	24°43'20"	91°12'40"	1	1	1.9	0.046	
12	Sunamgonj	Sulla	Sheh Arfin	99601080207	1	1		Sheh Arfin GPS	24°42'55"	91°13'31"	1	1	1.6	0.045	
13	Sunamgonj	Sulla	Kandabari	99601080301	1	1		Kandubati GPS	24°39'49"	91°15'02"	1	1	1	0.015	
14	Sunamgonj	Sulla	Dakhin Mamudpur	91601080533	1	1		Dakhin Mamudpur GPS	24°41'43"	91°13'43"	1	1	2.8	0.023	
15	Sunamgonj	Sulla	Roua	91601020406	1	1		Roua GPS	24°37'58"	91°13'34"	1	1	1.9	0.014	
16	Sunamgonj	Sulla	Simerkanda	99601080403	1	1		Simerkanda GPS	24°36'15"	91°13'31"	1	1	0.4	0.007	
17	Sunamgonj	Sulla	Mahmudnagar	91601080109	1	1		Mahmudnagar GPS	24°42'09"	91°13'38"	1	1	0.6	0.023	
18	Sunamgonj	Sulla	Shantipur	91601080582	1	1		Shantipur GPS	24°40'38"	91°15'34"	1	1	0.6	0.041	
19	Sunamgonj	Sulla	Keruala	99601080401	1	1		Keruala GPS	24°38'18"	91°12'34"	1	1	1.5	0.041	
20	Sunamgonj	Sulla	Mukterpur	91601080208	1	1		Mukterpur GPS	24°39'48"	91°15'27"	1	1	0.36	0.024	



Water Test Report for PEDP-4 Project

Work order No. 565, date : 20/12/2021 — Package No. : TW-296 — Contactor : M/S. Shahin Enterprise, Jhenaidah.

Sl. No.	District	Upazila	Village	School ID	Water Point		Name Of School	GPS Reading		Water Quality						Remarks
					Type	Depth (M)		Latitude	Longitude	Sand	Clear	As (mg/L)	Fe (mg/L)	Cl (mg/L)		
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15		16
13	Jhenaidah	Maheshpur	Bathangachi	204049021	DTSP		Bathangachi Adarsha Govt. Primary School	N: 23°19'11.63''	E: 88°56'56.35''	Free	Clear	0.052	2.82	20		✓
14	Jhenaidah	Maheshpur	Babla Mathavanga	204049042	DTSP		Babla Mathavanga Govt. Primary School	N: 23°19'02.16''	E: 88°55'06.39''	Free	Clear	0.115	2.71	15		
15	Jhenaidah	Maheshpur	Ramchandrapur	204041201	DTSP		Ramchandrapur Govt. Primary School	N: 23°21'17.85''	E: 88°56'34.47''	Free	Clear	0.071	1.80	15		
16	Jhenaidah	Maheshpur	Makordhachpur	204049027	DTSP		Makordhachpur Govt. Primary School	N: 23°14'57.17''	E: 88°49'38.89''	Free	Clear	0.069	1.66	15		✓

Note :- BDS (Bangladesh Drinking Standard) : As = 0.05 mg/L, Fe = 0.3-1.0 mg/L, Cl⁻ = 150-600 mg/L

Sample Collected by:
Md. Nazrul Islam
Junior Chemist
DPHE, Zonal Lab, Jhenaidah.

Sample Analyzed by:
13.11.2022
Md. Moniruzzaman
Sample Analyzer
DPHE, Zonal Lab, Jhenaidah.

Countersigned/Approved by:
13/11/2022
Md. Nazrul Islam
Junior Chemist
DPHE, Zonal Lab, Jhenaidah.

Government of the People's Republic of Bangladesh
Office of the Senior Chemist
Department of Public Health Engineering (DPHE)
Zonal Laboratory, Shahid Masiur Rahman Road,Jhenaidah.
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Water Test Report for PEDP-4 Project

Work order No. 565, date : 20/12/2021 — Package No. : TW-296 — Contactor : M/S. Shahin Enterprise, Jhenaidah.

Sl. No.	District	Upazilla	Village	School ID	Water Point		Name Of School	GPS Reading		Water Quality					Remarks
					Type	Depth (M)		Latitude	Longitude	Sand	Clear	As (mg/L)	Fe (mg/L)	Cl (mg/L)	
1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	Jhenaidah	Maheshpur	Lanighat	204049058	DTSP		Lanighat Govt. Primary School	N: 23°20'32.93''	E: 88°44'27.04''	Free	Clear	0.028	4.32	20	
2	Jhenaidah	Maheshpur	Bhabonagar	204049009	DTSP		Bhabonagar Govt. Primary School	N: 23°21'11.85''	E: 88°46'13.53''	Free	Clear	(0.053)	0.73	15	
3	Jhenaidah	Maheshpur	Nepa	204049006	DTSP		Nepa Govt. Primary School	N: 23°17'40.21''	E: 88°45'11.20''	Free	Clear	0.028	2.22	15	
4	Jhenaidah	Maheshpur	Kanchlonpur	204040602	DTSP		Kanchlonpur Govt. Primary School	N: 23°17'05.92''	E: 88°43'46.08''	Free	Clear	0.030	4.07	15	
5	Jhenaidah	Maheshpur	Solemanpur	204040603	DTSP		Solemanpur Govt. Primary School	N: 23°17'11.21''	E: 88°44'33.14''	Free	Clear	0.024	1.54	15	
6	Jhenaidah	Maheshpur	Baull Mohammadpur	204049033	DTSP		Baull Mohammadpur Govt. Primary School	N: 23°16'30.41''	E: 88°46'16.41''	Free	Clear	0.026	2.39	15	
7	Jhenaidah	Maheshpur	Bagadanga	204040604	DTSP		Bagadanga Govt. Primary School	N: 23°17'23.80''	E: 88°42'46.91''	Free	Clear	0.024	2.51	40	
8	Jhenaidah	Maheshpur	Gurdah	204040701	DTSP		Gurdah Govt. Primary School	N: 23°20'45.76''	E: 88°47'08.93''	Free	Clear	(0.070)	2.19	30	
9	Jhenaidah	Maheshpur	Talsar	204040703	DTSP		Talsar Govt. Primary School	N: 23°18'35.69''	E: 88°47'15.63''	Free	Clear	0.040	3.43	15	
10	Jhenaidah	Maheshpur	Padmapukur	204040704	DTSP		Padmapukur Govt. Primary School	N: 23°19'25.42''	E: 88°46'17.41''	Free	Clear	0.019	1.81	30	
11	Jhenaidah	Maheshpur	Sekhargari	204041007	DTSP		Sekhargari Govt. Primary School	N: 23°17'29.54''	E: 88°54'44.77''	Free	Clear	(0.139)	3.67	10	
12	Jhenaidah	Maheshpur	Nalpatua	204049054	DTSP		Nalpatua-2 Govt. Primary School	N: 23°17'13.13''	E: 88°50'51.30''	Free	Clear	0.044	1.53	35	

Note :- BDS (Bangladesh Drinking Standard) : As = 0.05 mg/L, Fe = 0.3-1.0 mg/L, Cl⁻ = 150-600 mg/L

Sample Collected by:
Md. Nazrul Islam
Junior Chemist
DPHE, Zonal Lab, Jhenaidah.

Sample Analyzed by:
15.11.2022
Md. Moniruzzaman
Sample Analyzer
DPHE, Zonal Lab, Jhenaidah.

Countersigned/Approved by:
13/11/2022
Md. Nazrul Islam
Junior Chemist
DPHE, Zonal Lab, Jhenaidah.

Table 1 - List of Unacceptable Water Sources where mitigation measures were considered

SL No	District	Name of School	EMIS Code	Test Result			Remark	Suggested Option	After intervention		
				As	Fe	Cl			As	Fe	Cl
1	Jhenaidah	Bhabonagar GPS.	204049009	0.053	<LOQ	<LOQ	not acceptable	RO Filter	0.009	<LOQ	<LOQ
2	Jhenaidah	Gurdah GPS.	204040701	0.07	<LOQ	<LOQ	not acceptable	RO Filter	0.018	<LOQ	<LOQ
3	Jhenaidah	Sekhargari GPS.	204041007	0.139	<LOQ	<LOQ	not acceptable	RO Filter	0.02	<LOQ	<LOQ
5	Jhenaidah	Babla Mathavanga GPS.	204049042	0.115	<LOQ	<LOQ	not acceptable	RO Filter	0.008	<LOQ	<LOQ
6	Jhenaidah	Ramchandrapur GPS.	204041201	0.071	<LOQ	<LOQ	not acceptable	RO Filter	0.012	<LOQ	<LOQ
7	Jhenaidah	Makordhachpur GPS.	204049027	0.069	<LOQ	<LOQ	not acceptable	RO Filter	0.025	<LOQ	<LOQ
8	Sunamganj	Chakua GPS	91601080303	0.061	<LOQ	<LOQ	not acceptable	RO Filter	0.018	<LOQ	<LOQ
9	Sunamganj	LANKAPATHARIA GPS.	91601070309	0.9	<LOQ	<LOQ	not acceptable	RO Filter	0.022	<LOQ	<LOQ
10	Sunamganj	NOYA BANDHA GPS.	99601070108	0.8	<LOQ	<LOQ	not acceptable	RO Filter	0.016	<LOQ	<LOQ
11	Sunamganj	GOFHURENNESHA DOSDHARY NNGPS.	99601079016	1.8	<LOQ	<LOQ	not acceptable	RO Filter	0.007	<LOQ	<LOQ
12	Sunamganj	DHARMA PASHA NO 1 MODEL GPS.	91601070301	0.8	<LOQ	<LOQ	not acceptable	RO Filter	0.011	<LOQ	<LOQ
13	Sunamganj	NUR PUR	91601070507	1.2	<LOQ	<LOQ	not acceptable	RO Filter	0.011	<LOQ	<LOQ
14	Sunamganj	BAGBARI GPS.	91601070509	0.6	<LOQ	<LOQ	not acceptable	RO Filter	0.014	<LOQ	<LOQ
15	Sunamganj	DIGJAN GPS.	91601070504	1.4	<LOQ	<LOQ	not acceptable	RO Filter	0.005	<LOQ	<LOQ
16	Sunamganj	PATHARIA KANDA	91601070502	3.4	<LOQ	<LOQ	not acceptable	RO Filter	0.015	<LOQ	<LOQ
17	Sunamganj	BARIR KANDI GPS.	99601070602	0.8	<LOQ	<LOQ	not acceptable	RO Filter	0.019	<LOQ	<LOQ
18	Sunamganj	NIZAMPUR NNGPS.	99601079015	0.9	<LOQ	<LOQ	not acceptable	RO Filter	0.022	<LOQ	<LOQ

SL No	District	Name of School	EMIS Code	Test Result			Remark	Suggested Option	After intervention		
				As	Fe	Cl			As	Fe	Cl
19	Sunamganj	MASKANDA GPS.	99601070209	1.8	<LOQ	<LOQ	not acceptable	RO Filter	0.025	<LOQ	<LOQ
20	Sunamganj	RAYPUR GPS.	99601070210	2.8	<LOQ	<LOQ	not acceptable	RO Filter	0.035	<LOQ	<LOQ
21	Sunamganj	HIZLA NNGPS.	99601079009	1.2	<LOQ	<LOQ	not acceptable	RO Filter	0.029	<LOQ	<LOQ
22	Sunamganj	DOWLATPUR GPS.	99601070802	0.9	<LOQ	<LOQ	not acceptable	RO Filter	0.018	<LOQ	<LOQ
23	Sunamganj	ABIDNAGAR GPS.	91601071001	1.4	<LOQ	<LOQ	not acceptable	RO Filter	0.015	<LOQ	<LOQ
24	Sunamganj	RAJAPUR GPS.	91601070601	1.3	<LOQ	<LOQ	not acceptable	RO Filter	0.019	<LOQ	<LOQ
25	Sunamganj	DOULTHPUR GPS.	91601070603	3.8	<LOQ	<LOQ	not acceptable	RO Filter	0.039	<LOQ	<LOQ
26	Sunamganj	JAYSRI DAKKHIN GPS.	99601070410	3.5	<LOQ	<LOQ	not acceptable	RO Filter	0.022	<LOQ	<LOQ
27	Sunamganj	DATIA PARA GPS.	91601070809	1.6	<LOQ	<LOQ	not acceptable	RO Filter	0.009	<LOQ	<LOQ
28	Sunamganj	SATUR GPS.	91601070806	2.2	<LOQ	<LOQ	not acceptable	RO Filter	0.019	<LOQ	<LOQ

Appendix-7: Water Quality Monitoring and Surveillance Protocol by DPHE

বাংলাদেশের পল্লী পানি সরবরাহ ব্যবস্থার

পানির গুণাগুণ মনিটরিং ও সার্ভিল্যান্স

প্রটোকল

(Water Quality Monitoring and Surveillance Protocol for Rural Water Supply System in Bangladesh)

জনস্বাস্থ্য প্রকৌশল অধিদপ্তর

আগস্ট ২০০৫

পরিশিষ্ট ১-৭ মূলে নির্দেশ করা হয়েছে। নির্বাচিত ক্রিটিক্যাল রাসায়নিক (critical chemical) প্যারামিটারসমূহ নিম্নে বর্ণনা করা হলো।

আর্সেনিক

১৯৯৩ সালে ভূ-গর্ভস্থ পানিতে আর্সেনিক দূষণের বিষয়টি উদ্ঘাটিত হওয়ার পর থেকে বাংলাদেশের ২৭৫ টি উপজেলার অগভীর নলকূপসমূহে বিভিন্ন মাত্রায় আর্সেনিক দূষণসংঘটিত হয়েছে। আর্সেনিক দূষিত পানি ব্যবহারে ফলে জনস্বাস্থ্য ঝুঁকির সম্মুখীন হয়, যা জনগণের মধ্যে কয়েক বছরের মধ্যে আর্সেনিকোসিস (arsenicosis) এর লক্ষণ হিসেবে প্রকাশ পাবে, এবং অভ্যন্তরীণ ও চর্ম ক্যানসারও হতে পারে। বাংলাদেশে আর্সেনিকই একমাত্র রাসায়নিক যৌগ যার ফলে স্বাস্থ্যের প্রতি মারাত্মক প্রতিক্রিয়া দেখা দিয়েছে।

নিয়মিত লাবরেটরী প্রযুক্তি ব্যবহারের মাধ্যমে পানিতে আর্সেনিকের মাত্রার ভিত্তিতে বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (৩য় সংস্করণ) পানীয় জলের সাময়িক গাইড লাইন মান হিসেবে প্রতি লিটার পানীয় জলে ০.০১ মিলিগ্রাম (১০ মাইক্রোগ্রাম/লিটার) আর্সেনিকের উপস্থিতি নির্ধারণ করেছে। বাংলাদেশে বর্তমানে আর্সেনিকের ষ্ট্যান্ডার্ড মান প্রতি লিটারে ০.০৫ মিলি গ্রাম বা ৫০ মাইক্রোগ্রাম।

ক্লোরাইড বা লবণাক্ততা (chloride)

বাংলাদেশের উপকূলীয় অঞ্চলের অগভীর নলকূপসমূহে উচ্চ মাত্রায় ক্লোরাইড বা লবণাক্ততা রয়েছে। লবণাক্ততা অনুপ্রবেশের কারণে বাংলাদেশে অগভীর পানিস্তরে লবনাক্ততা ক্রমশঃ বাড়ছে। তবে গভীর নলকূপসমূহে সাধারনতঃ কম মাত্রার লবণাক্ততা রয়েছে। পানির গুণাগুণ বিষয়ক বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (৩য় সংস্করণ) স্বাস্থ্যগত কোন গাইড লাইন মান প্রতিষ্ঠা করা হয়নি। তবে লক্ষনীয় যে, প্রতি লিটারে ২৫০ মিলিগ্রাম মাত্রার বেশী লবণাক্ততা পানীয় জলের স্বাদ এবং গ্রহণযোগ্যতার প্রভাব ফেলে। ক্লোরাইড থেকে উদ্ভূত স্বাদ সংযুক্ত কেশনের (cation) উপর নির্ভরশীল এবং সোডিয়াম, পটাশিয়াম এবং ক্যালশিয়াম ক্লোরাইডের মাত্রা প্রতি লিটার পানিতে ২০০ থেকে ৩০০ মিলি গ্রাম। বাংলাদেশে প্রতি লিটার পানিতে ১৫০ থেকে ৬০০ মিলিগ্রাম ক্লোরাইড গ্রহণযোগ্য এবং উপকূলীয় অঞ্চলে ভাল কোন উৎস না থাকলে প্রতি লিটারে ১০০০ মিলিগ্রাম পর্যন্ত গ্রহণ করা যায়।

আয়রন বা লৌহ (iron)

পানীয় জলে সাধারণভাবে লক্ষণীয় আয়রন বা লৌহের উপস্থিতি স্বাস্থ্যের জন্য উদ্বেগের বিষয় নহে। যদিও এর নিম্নতর মাত্রার দূষণে পানির চেহারা ও স্বাদে প্রভাব ফেলে। পানীয় জলের গুণাগুণ বিষয়ক বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (২য় সংস্করণ)-এ প্রতি লিটার পানিতে আয়রনের সাময়িক গাইড লাইন মান ০.০৩ মিলিগ্রাম নির্ধারণ করা হয়েছে। তবে এর ৩য় সংস্করণে আয়রনের জন্য কোন গাইড লাইন মান নির্ণয় করা হয়নি।

বাংলাদেশের অনেক অঞ্চলে আয়রনের উপস্থিতি গ্রহনযোগ্য সীমার চেয়ে বেশী। তাই কান্ত্রিগত উদ্দেশ্যে ক্ষুদ্র আয়রন দূরীকরণ ইউনিট (mini iron removal units, IRU)-এর মাধ্যমে আয়রন দূরীকরণের চেষ্টা করা হয়। বাংলাদেশ ষ্ট্যান্ডার্ড অনুযায়ী পানীয় জলে আয়রনের উপস্থিতি হলো ০.৩-১.০মিলিগ্রাম / লিটার । পল্লী অঞ্চলে যেখানে পানির বিকল্প কোন উৎস নেই, সেখানে প্রতি লিটারে ৫.০ মিলিগ্রাম পর্যন্ত আয়রনের উপস্থিতিও গ্রহণযোগ্য বলে বিবেচিত হয়। এ সীমা বেড়ে গেলে আয়রন দূরীকরণ ইউনিট (iron removal unit) স্থাপন করা প্রয়োজন।

ম্যাঙ্গানিজ (manganese)

পানীয় জল সম্বন্ধীয় বিশ্ব স্বাস্থ্য সংস্থার গাইড লাইনে (২০০৪) প্রতি লিটারে ০.৪ মিলিগ্রাম ম্যাঙ্গানিজের উপস্থিতি সাময়িকভাবে স্বাস্থ্যগত গাইড লাইন মান হিসেবে গ্রহণ করা হয়েছে। পানি সরবরাহে প্রতি লিটারে ০.১ মিগিগ্রামের অধিক মাত্রায় ম্যাঙ্গানিজের উপস্থিতি থাকলে কোমল পানীয়তে অনাকাঙ্ক্ষিত স্বাদ এবং কাপড় চোপড়ে ও থালা বাসনে দাগ সৃষ্টি করে। বাংলাদেশ ষ্ট্যান্ডার্ড অনুযায়ী পানীয় জলে ম্যাঙ্গানিজের উপস্থিতি হলো ০.১ মিলিগ্রাম / লিটার।

Appendix-8: Participant attendance sheet and photo of the capacity building program

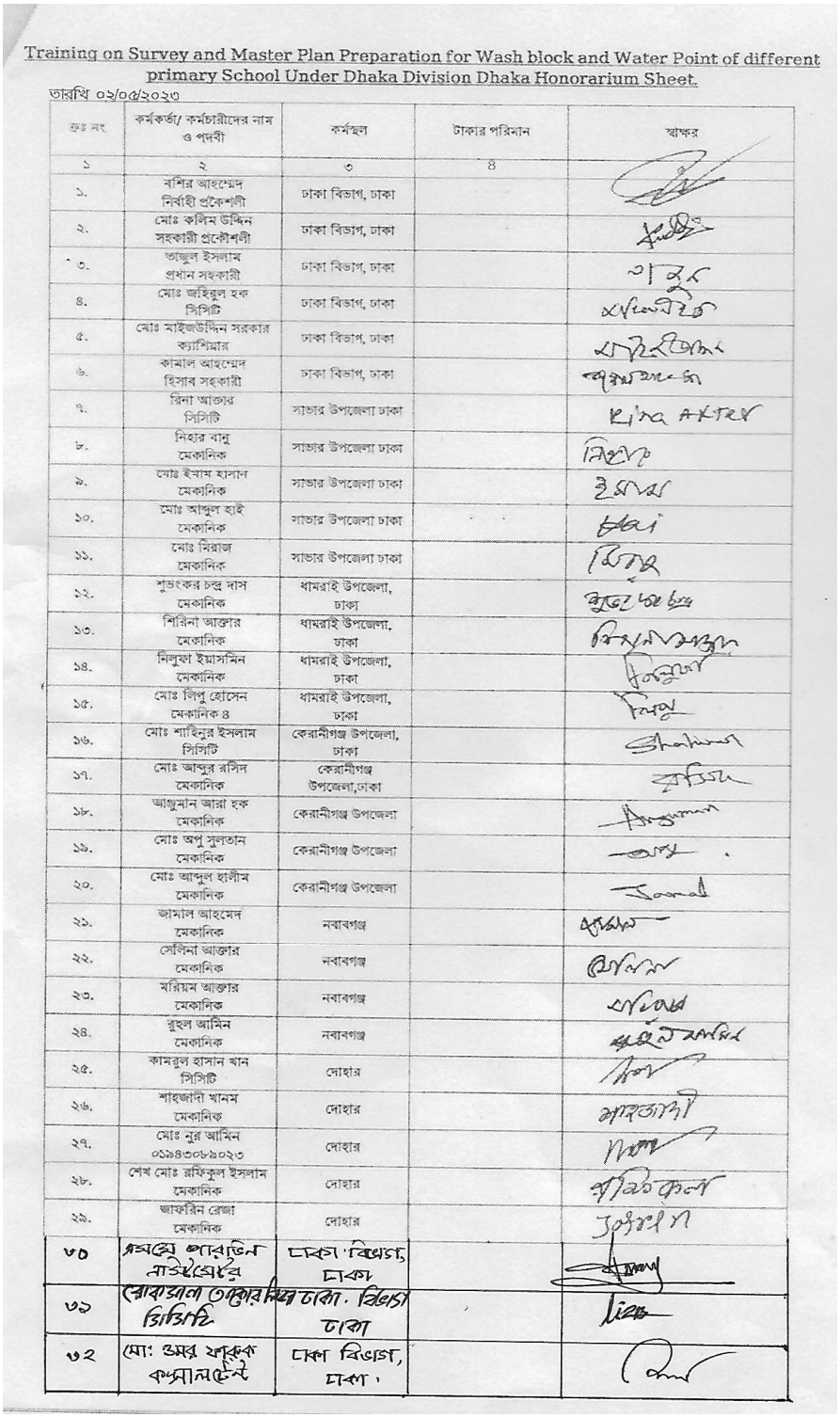
প্রাথমিক শিক্ষা ইউনিট কর্তৃক আয়োজিত সভায় উপস্থিতির তালিকা

তারিখঃ ২৭/০৪/২০২৩

স্থানঃ বিভাগীয় অফিস জনস্বাস্থ্য প্রকৌশল অধিদপ্তর, রংপুর। সময়ঃ সকাল ১০.০০টা।

ক্রমিক নং	নাম ও পদবী	সম্মানির পরিমান	কর্মস্থল	স্বাক্ষর
১	পঙ্কজ কুমার সাহা (নির্বাহী প্রকৌশলী)		রংপুর	
২	মোঃ নিজামুল হক (সহকারী-প্রকৌশলী)		রংপুর	
৩	মোঃ আফজাল হোসেন (প্রাক্কলনিক)		রংপুর	
৪	মোঃ আলম বাদশা (সুপারভিশন কনসালটেন্ট)		রংপুর	
৫	মোঃ মোবাশেরুল ইসলাম		পীরগঞ্জ	
৬	মোঃ হারুন-অর-রশিদ		মিঠাপুকুর	
৭	মোঃ মোসফিকুর রহমান		মিঠাপুকুর	
৮	মোঃ ইকবাল হোসেন		পীরগাছা	
৯	মোঃ শাহজাহান		পীরগাছা	
১০	মোঃ আব্বাছ আলী মিয়া		পীরগাছা	
১১	শাহ মোঃ শফিকুল ইসলাম		পীরগাছা	
১২	মোঃ মাহবুবুল আলম		গংগাচড়া	
১৩	মোঃ সুজালুর রহমান		তারাগঞ্জ	
১৪	মোঃ আজহারুল ইসলাম		বদরগঞ্জ	
১৫	মোঃ মাহবুবুর রহমান		সদর,রংপুর	
১৬	পলাশ কুমার সরকার		বদরগঞ্জ	
১৭	মোঃ মনিরুজ্জামান		সদর,রংপুর	
১৮	মোঃ সাইফুল ইসলাম		সদর,রংপুর	
১৯	মোঃ আব্দুল মোনয়েম		সদর,রংপুর	
২০	মোঃ শামছুল হক		সদর,রংপুর	
২১	বাবুল চন্দ্র সরকার		সদর,রংপুর	
২২	অরুণ কুমার রায়		সদর,রংপুর	
২৩	মোঃ নুরুজ্জামান		সদর,রংপুর	
২৪	হৃদয় কুমার সরকার		সদর,রংপুর	
২৫	দীনেশ চন্দ্র বর্মন		গংগাচড়া	
২৬	বলরাম রায়		গংগাচড়া	
২৭	মোসাম্মাৎ আনজুমান আরা (প্রধান শিক্ষক)		তারাগঞ্জ	
২৮	মোছাঃ মনিরা আকতার উরমি (প্রধান শিক্ষক)		সদর,রংপুর	
২৯	মোছাঃ শামসুন আরা বেগম (প্রধান শিক্ষক)		সদর,রংপুর	
৩০	মোছাঃ সাইয়েদা খাতুন (প্রধান শিক্ষক)		সদর,রংপুর	
৩১	মোছাঃ তানজিনা বেগম (প্রধান শিক্ষক)		পীরগঞ্জ	
৩২	মোছাঃ সুফিয়া বেগম (প্রধান শিক্ষক)		পীরগাছা	
৩৩	মোছাঃ খালেদা খাতুন (প্রধান শিক্ষক)		পীরগাছা	
৩৪	মোছাঃ নূরজাহান বেগম (প্রধান শিক্ষক)		পীরগাছা	
৩৫	মোছাঃ হোসনেআরা বেগম (প্রধান শিক্ষক)		পীরগাছা	

(পঙ্কজ কুমার সাহা)
নির্বাহী প্রকৌশলী
জনস্বাস্থ্য প্রকৌশল অধিদপ্তর
রংপুর বিভাগ, রংপুর।



Training on Survey and Master Plan Preparation for Wash block and Water Point of different primary School Under Dhaka Division Dhaka Honorarium Sheet.

তারিখ ০২/০৫/২০২৩

ক্রঃ নং	কর্মকর্তা/ কর্মচারীদের নাম ও পদবী	কর্মস্থল	টাকার পরিমান	স্বাক্ষর
১	২	৩	৪	
১.	বশির আহম্মেদ নির্বাহী প্রকৌশলী	ঢাকা বিভাগ, ঢাকা		
২.	মোঃ কলিম উদ্দিন সহকারী প্রকৌশলী	ঢাকা বিভাগ, ঢাকা		
৩.	তাজুল ইসলাম প্রধান সহকারী	ঢাকা বিভাগ, ঢাকা		
৪.	মোঃ জহিরুল হক সিসিটি	ঢাকা বিভাগ, ঢাকা		
৫.	মোঃ মাইজউদ্দিন সরকার ক্যাশিয়ার	ঢাকা বিভাগ, ঢাকা		
৬.	কামাল আহম্মেদ হিসাব সহকারী	ঢাকা বিভাগ, ঢাকা		
৭.	রিনা আক্তার সিসিটি	সাভার উপজেলা ঢাকা		
৮.	নিহার বানু মেকানিক	সাভার উপজেলা ঢাকা		
৯.	মোঃ ইমাম হালদার মেকানিক	সাভার উপজেলা ঢাকা		
১০.	মোঃ আব্দুল হাই মেকানিক	সাভার উপজেলা ঢাকা		
১১.	মোঃ মিরাজ মেকানিক	সাভার উপজেলা ঢাকা		
১২.	শুভংকর চন্দ্র দাস মেকানিক	ধামরাই উপজেলা, ঢাকা		
১৩.	শিরিনা আক্তার মেকানিক	ধামরাই উপজেলা, ঢাকা		
১৪.	নিলুফা ইয়াসমিন মেকানিক	ধামরাই উপজেলা, ঢাকা		
১৫.	মোঃ লিপু হোসেন মেকানিক ৪	ধামরাই উপজেলা, ঢাকা		
১৬.	মোঃ শাহিনুর ইসলাম সিসিটি	কেরানীগঞ্জ উপজেলা, ঢাকা		
১৭.	মোঃ আব্দুর রসিদ মেকানিক	কেরানীগঞ্জ উপজেলা,ঢাকা		
১৮.	আজুমান আরা হক মেকানিক	কেরানীগঞ্জ উপজেলা		
১৯.	মোঃ অপু সুলতান মেকানিক	কেরানীগঞ্জ উপজেলা		
২০.	মোঃ আব্দুল হালীম মেকানিক	কেরানীগঞ্জ উপজেলা		
২১.	জামাল আহমেদ মেকানিক	নবাবগঞ্জ		
২২.	সেলিনা আক্তার মেকানিক	নবাবগঞ্জ		
২৩.	মরিয়ম আক্তার মেকানিক	নবাবগঞ্জ		
২৪.	রুহুল আমিন মেকানিক	নবাবগঞ্জ		
২৫.	কামরুল হাসান খান সিসিটি	দোহার		
২৬.	শাহজাদী খানম মেকানিক	দোহার		
২৭.	মোঃ নুর আমিন ০১৯৪৩০৮৯০২৩	দোহার		
২৮.	শেখ মোঃ রফিকুল ইসলাম মেকানিক	দোহার		
২৯.	জাফরিন রেজা মেকানিক	দোহার		
৩০	[illegible]	ঢাকা বিভাগ, ঢাকা		
৩১	[illegible]	ঢাকা বিভাগ, ঢাকা		
৩২	মোঃ ওমর ফারুক কামালহোসেন	ঢাকা বিভাগ, ঢাকা		

প্রাথমিক শিক্ষা ইউনিট কর্তৃক আয়োজিত সভায় উপস্থিতির তালিকা

তারিখঃ
০১/০৪/২০২৩ ইং

সময়ঃ সকাল
১০.০০টা।

স্থানঃ বিভাগীয় অফিস, জনস্বাস্থ্য প্রকৌশল অধিদপ্তর, চট্টগ্রাম।

নং	নাম ও পদবী	সম্মানির পরিমান	কর্মস্থল	স্বাক্ষর
১.	জনাব প্রকৌঃ পলাশ চন্দ্র দাস নির্বাহী প্রকৌশলী		চট্টগ্রাম বিভাগ	
২.	জনাব কে.এম.সাইদ মাহমুদ- সহকারী প্রকৌশলী		মীরসরাই	
৩.	জনাব প্রনবেশ মহাজন- সহকারী প্রকৌশলী		ফটিকছড়ি	
৪.	জনাব মোঃ ইকবাল হোসাইন- সহকারী প্রকৌশলী		হাটহাজারী	
৫.	জনাবা প্রিয়াংকা চাকমা- সহকারী প্রকৌশলী		আনোয়ারা	
৬.	জনাব সুদস্সী দেওয়ান- সহকারী প্রকৌশলী		বোয়ালখালী	
৭.	জনাব সুকান্ত চাকমা সহকারী প্রকৌশলী (সমগ্রদেশে নিরাপদ পানি সরবরাহ প্রকল্প)		চট্টগ্রাম বিভাগ	
৮.	জনাব সৌরভ চক্রবর্তী সুপারভিশন কন্সালটেন্ট (পিইডিপি-৪)		চট্টগ্রাম বিভাগ	
৯.	জনাব রাশেদুজ্জামান- উপ-সহকারী প্রকৌশলী		সীতাকুন্ড	
১০.	জনাব ইয়াকুব ফারহান- উপ-সহকারী প্রকৌশলী		রাঙ্গুনিয়া	
১১.	জনাব মোঃ রহমত উল্যাহ- উপ-সহকারী প্রকৌশলী		রাউজান	
১২.	জনাব উত্তম কুমার মজুমদার উপ-সহকারী প্রকৌশলী		পটিয়া	
১৩.	জনাব ফরহাদ উদ্দীন- উপ-সহকারী প্রকৌশলী		চন্দনাইশ	
১৪.	জনাব মাহমুদুল হাসান উপ-সহকারী প্রকৌশলী		লোহাগাড়া	
১৫.	জনাব মোঃ মিজানুর রহমান উপ-সহকারী প্রকৌশলী		সাতকানিয়া	
১৬.	জনাব নাজিম উদ্দিন রাসেল উপ-সহকারী প্রকৌশলী		কর্ণফুলী	

১৭.	জনাব সঞ্জিত চন্দ্র সরকার উপ-সহকারী প্রকৌশলী		বাঁশখালী	
১৮.	জনাব রবিন সরকার- উপ-সহকারী প্রকৌশলী		সন্দ্বীপ	
১৯.	জনাব মাঈন উদ্দিন নক্সাকার		চট্টগ্রাম বিভাগ	
২০.	জনাবা মারজাহান বেগম প্রকৌশলনিক		চট্টগ্রাম বিভাগ	
২১.	জনাবা ঝুম্পা রানী কর্মকার অফিস সহকারী কাম কম্পিউটার মুদ্রাক্ষরিক		সীতাকুন্ড	
২২.	জনাবা আফছানা আক্তার মেকানিক		সীতাকুন্ড	
২৩.	জনাবা মিফতাহুল জান্নাত মনি মেকানিক		আনোয়ারা	
২৪.	জনাবা শ্রাবনী পাল মেকানিক		বোয়ালখালী	
২৫.	জনাবা পূরবী রানী দে মেকানিক		রাঙ্গুনিয়া	
২৬.	জনাবা পাপড়ি দাশ গুপ্তা . মেকানিক		ফটিকছড়ি	
২৭.	জনাবা উম্মে রোউয়ান সিদ্দিক মেকানিক		কর্ণফুলী	
২৮.	জনাবা আছমাউল হোছনা মেকানিক		কর্ণফুলী	
২৯.	জনাব রূপন নাগ মেকানিক		আনোয়ারা	
৩০.	জনাব মোঃ আফছার উদ্দীন মেকানিক		সীতাকুন্ড	
৩১.	জনাব টিটু রুদ্র মেকানিক		সাতকানিয়া	
৩২.	জনাব মোঃ ফোরকান মেকানিক		লোহাগাড়া	
৩৩.	জনাব সাখাওয়াত হোসেন মেকানিক		বোয়ালখালী	
৩৪.	জনাব খালেদ মোশারফ মেকানিক		সন্দ্বীপ	
৩৫.	জনাব মোঃ বেলাল হোসেন মেকানিক		হাটহাজারী	
৩৬.	জনাব মিশু চৌধুরী মেকানিক		রাঙ্গুনিয়া	
৩৭.	জনাব পংকজ কান্তি নাগ মেকানিক		রাউজান	
৩৮.	জনাব প্রবাল বড়ুয়া মেকানিক		চন্দনাইশ	

Photos of the capacity building training held at Chittagong

Appendix-9: Field Monitoring Photos of Environmental safeguard screening

(a) Monitoring visit photos of the Rajshahi Division.

(b) Monitoring visit photos of the Rangpur District

(c) Monitoring visit photos of the Chittagong District.

(d) Monitoring visit photos of the Sylhet District.

(e) Monitoring visit photos of the Khulna District.

(f) Monitoring visit photos of the Mymensingh District.

Appendix-10: Photo logs of safeguard monitoring

আঠারবাড়ী সরকারি প্রাথমিক বিদ্যালয়

ঈশ্বরগঞ্জ, ময়মনসিংহ।

চরহাজারী জগন্নাথ সরকারি প্রাথমিক

কোম্পানীগঞ্জ, নোয়াখালী।

আগোলপুর সরকারি প্রাথমিক বিদ্যালয়

গোদাগাড়ী, রাজশাহী।

বলদিবাথান সরকারি প্রাথমিক বিদ্যালয়

মিঠাপুকুর, রংপুর।

লালমোহন হাই স্কুল সংলগ্ন সরকারি প্রাথমিক বিদ্যালয়

লালমোহন, ভোলা।

তালতলা সরকারি প্রাথমিক বিদ্যালয়

রূপসা, খুলনা।