

Environmental Monitoring Report

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Prepared by Department of Public Health Engineering (DPHE) for the People's Republic of Bangladesh, The World Bank and the Asian Development Bank.

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THIRD PRIMARY EDUCATION DEVELOPMENT PROGRAM (PEDP3)

August

2017



REPORT ON ENVIRONMENTAL SCREENING AND MONITORING OF
WATER SOURCES AND WASH BLOCKS INSTALLED AND HANDED
OVER TO PRIMARY SCHOOLS FROM (JANUARY 2017 TO JUNE 2017)



DEPARTMENT OF PUBLIC HEALTH ENGINEERING (DPHE)



Abbreviations

ADB	:	Asian Development Bank
AusAID	:	Australian Agency for International Development
CIDA	:	Canadian International Development Agency
DFID	:	Department for International Development (of the United Kingdom)
DP	:	Development Partner
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
IDA	:	International Development Association
JARM	:	Joint Annual Review Mission
JICA	:	Japan International Cooperation Agency
LGD	:	Local Government Division
MIS	:	Management Information System
MLGRD&C	:	Ministry of Local Government, Rural Development and Cooperatives
MoPME	:	Ministry of Primary and Mass Education
MOU	:	Memorandum of Understanding
PEDP-3	:	Third Primary Education Development Program
SDTW	:	Semi Deep Tube Well
STW	:	Semi Tube Well
SIDA	:	Swedish International Development Agency
TSP	:	Tube Well with Submersible Pump
UNICEF	:	United Nations International Children's Emergency Fund
WB	:	World Bank



Contents

Contents.....	2
List of Figures	3
List of Tables	4
1.0 Introduction:	5
2.0 Purpose of the report:	5
3.0 Methodology:.....	6
4.0 Indicators of Environmental Safeguard under PEDP3:	6
5.0 DPHE Officials practicing Revised EMF:	7
6.0 Comprehensive Monitoring Scheme in PEDP3-DPHE's Role:	7
7.0 DPHE's Progress in Environmental Screening:.....	9
8.0 Environmental Monitoring: (Findings):.....	9
8.1 Water Sources.....	9
8.1.1 Losses of Agricultural Lands:.....	12
8.1.2 Environment of Water Supply Facility:	12
8.1.3 Surface Water Pollution:.....	14
8.1.4 Facilities for Draining out of Water:.....	14
8.1.5 Source of Water Supply:	15
8.1.6 Concern about water Quality:.....	16
8.1.7 Arsenic, Iron & Chloride Contamination:.....	17
8.1.8 Miscellaneous Observations:	18
8.1.9 Summary of Observations:.....	18
8.2 WASH BLOCK.....	19
8.2.1 Type and availability of Existing Toilet:.....	21
8.2.2 Cleanliness of Wash Block:.....	22
8.2.3 Hand washing Facility:	23
8.2.4 Foot Washing Facility:	24
8.2.5 Construction Supervision & Quality Control:.....	24



8.2.6	Production of Dust & Noise during Construction:	25
8.2.7	Miscellaneous Observations:	26
9.0	Lessons Learnt:.....	27
10.0	Conclusions & Recommendations:	27
<i>Annex A: New ESF Survey Format</i>		30
Environmental Screening Format under PEDP-3 for Water Sources.....		30
Environmental Screening Format under PEDP-3 for Wash Block.....		31
<i>Annex B: Tube well Case Study:</i>		32
Case Study-01.....		32
<i>Annex C: Wash Block Case Study:</i>		34
Case Study-01.....		34
<i>Annex D: Sample Water Test Report by DPHE Laboratory:</i>		36

List of Figures

Figure 1: Monitoring Scheme in PEDP3	7
Figure 2: DPHE's Role in Environmental Management.....	8
Figure 3: Co-ordination meeting between DPE & DPHE Officials.....	8
Figure 4: Distribution of Water Sources	10
Figure 5: Division wise Tube well Distribution	12
Figure 6: Division wise Environment of Water Supply Facility	14
Figure 7: Environment of Water Supply Facility	14
Figure 8: Impact after Implementation	14
Figure 9: DPHE Zonal Laboratory setup for water testing	16
Figure 10: Arsenic, Iron & Chloride Contamination.....	17
Figure 11: AIRP & Sono Filter	17
Figure 12: Distribution of Wash Block	20
Figure 13: Detail Distribution of Wash Block	20
Figure 14: Division wise Wash Block Distribution	21
Figure 15: Cleanliness of Wash block.....	22
Figure 16: Impact after Implementation	22
Figure 17: Executive Engineer, DPHE conducting Hygiene Promotion Campaign.....	23
Figure 18: Multiple user Hand Washing System.....	24
Figure 19: Construction Supervision From Lay Out to Roof Casting of Wash Block.	25
Figure 20: Water Source	32
Figure 21: Before Cleaning	35
Figure 22: After Cleaning	35



List of Tables

Table 1: DPHE submitted Environmental Report Status.....	9
Table 2: Distribution of Tube wells by their type and Administrative Division	11
Table 3: Environment of Water Supply Facility.....	13
Table 4: Facilities for Draining out of Water.....	15
Table 5: Source of Existing Water Supply	15
Table 6: Important Environmental Issues Observed	18
Table 7: Elements of WASH BLOCK Provided.....	19
Table 8: Construction of WASH Blocks in Different Administrative Divisions	20
Table 9: Updated Status of Wash Block constructed in reporting tenure	21
Table 10: Existing Toilet Condition in Schools	22
Table 11: Important Environmental Observations	26



1.0 Introduction:

Children are the asset of our nation. The children of Bangladesh's right to education have been eloquently articulated in the Constitution of Bangladesh. PEDP-3 is the third in a series of large investments in education in Bangladesh over the past twenty years. It is supported by significant contributions from Development Partners and its scope is the entire primary education sector. Creating a child friendly physical environment in the school through provision of safe drinking water and sanitation facilities for both boys and girls is one of the prime purposes of PEDP-3. Department of Public Health Engineering (DPHE) under Local Government Division (LGD) of Ministry of Local Government, Rural Development and Cooperatives (MLGRD&C) is responsible to provide infrastructure facilities for quality water supply and sanitation in the primary schools of Bangladesh. As per MoU signed in January 2012, between DPE and DPHE, it is DPHE who is responsible for following activities with an aim to provide safe drinking water and sanitation services for primary schools under PEDP-3:

- ✚ Implement, install, repair and/or replace drinking water sources
- ✚ Water quality testing/ monitoring
- ✚ Construction of latrines (wash block)
- ✚ O&M of water points
- ✚ O & M of latrines (wash block)

2.0 Purpose of the report:

The purpose of environmental monitoring

- ✚ Is to ensure that envisaged purpose of PEDP-3 is achieved and result in desired benefits without adversely affecting environmental resources.
- ✚ Is to modify some of the tools based on the experiences gained during the last tenure to ensure that neither the infrastructure, both in terms of needs nor quality at primary schools, nor the environment is compromised through the program intervention.
- ✚ Is to avoid potentially adverse environmental impacts and enhance environmental outcomes the project is expected to have limited and minimum adverse environmental impacts.
- ✚ 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.

This report presents the findings from monitoring of the Water Points and WASH blocks installed from January 2017 up to June 2017. Revised Environmental Management Framework (EMF) has been followed for construction, management, operation and maintenance in providing safe drinking water and sanitation facilities for the teachers and students of the primary schools. This report covers the survey results/findings in light of revised EMF.

3.0 Methodology:

The assistant engineer at upazilla level primarily undertakes the environmental screening of the work with the help of the sub-assistant engineers. The executive engineers at district level verify the reports and send those to the Head Quarter where finally the reports are compiled. Data for Environmental screening of water sources and WASH Blocks have been collected from the schools through DPHE official sources using the structured format (copy enclosed in Annex A of this report) prepared from revised EMF guidelines. Data collected from grass root level have been entered in 'Master Survey Outcome' Spread sheet by DPHE MIS UNIT and kept structured for database.

4.0 Indicators of Environmental Safeguard under PEDP3:

General principles relevant to WASH of the environmental management in PEDP-3 are mentioned below:

- Annual water quality monitoring of all the installed tube-wells under PPEDP-3 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 a mechanism for regular cleaning and routine maintenance will be developed.
- To solve the drinking water problem in remote hilly areas and coastal areas, rainwater harvesting and other feasible options will be explored.

In general, the following indicators need to be monitored during field visit as 'spot check':

- 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.

5.0 DPHE Officials practicing Revised EMF:

DPHE implemented its environmental screening based on the revised EMF guidelines. The previous three environmental reports of DPHE (April 2014 to March 2015, April 2015 to June 2016, July 2016 to December 2016) were submitted based on the revised EMF. DPHE conducted circle wise training with the help of ToT trainers (a number of 22 officers of DPHE received ToT from 24 August to 02 September, 2015) and completed training of all concerned officers in order to receive quality environmental screening data from grass root level.

The revised monitoring instrument addresses the current environmental condition (baseline) and its impact without intervention. It also predicts the impact on environment during construction. Based on these observations, construction planning is done in such a manner that minimizes the detrimental environmental impact. DPHE monitor the impact on environmental parameters during post evaluation stage.

6.0 Comprehensive Monitoring Scheme in PEDP3-DPHE's Role:

PEDP-3 project and its components especially infrastructure are monitored comprehensively by several parties from commencement to operation. Following chart shows the monitoring scheme in PEDP-3.

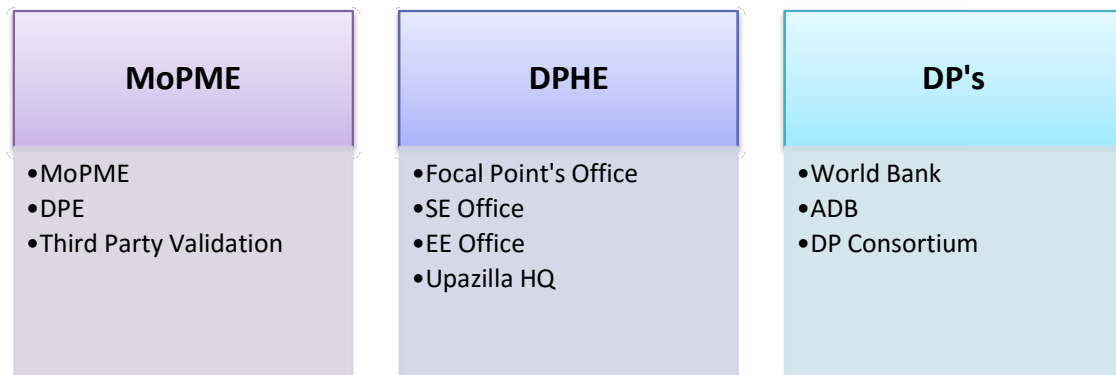


Figure 1: Monitoring Scheme in PEDP3

As an implementing agency DPHE is also involved significantly. Role of DPHE is depicted in the following figure.



Figure 2: DPHE's Role in Environmental Management

The defect liability period for Water Point installation and Wash Block construction is 02 years and 01 year respectively. Contractor is responsible to rectify any sort of defects within this time frame.

DPHE district office arranges monthly monitoring meeting among 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 used to visit the site frequently in order to monitor the ongoing and completed works and also focus the environmental aspects. Visit from Focal Point's Office and Head office happens frequently.

In every 3 months, there happens a coordination meeting in district office between DPHE officials (EE, AE, SAE) and DPE officials (DPEO, UEO). In this meeting, officers from education department point out the necessity of monitoring of particular school. Figure-3 shows the real picture of a co-ordination meeting.



Figure 3: Co-ordination meeting between DPE & DPHE Officials



DPHE arranges caretaker training and provides 'Maintenance Manual' to the concerned schools during project handover which covers Environment Issues after construction.

According to the order of Chief Engineer, DPHE vide memo no. 1066, dated: 16/09/2013, the packages where defects liability period is over, DPHE will still repair the tube well within 72 hours of receiving information provided concerned school bears the expense of spare parts.

7.0 DPHE's Progress in Environmental Screening:

DPHE so far contracted a number of 34,661 water points in the primary schools throughout the country under PEDP-3. Of them, 32,721 have been handed over to respective Schools. A number of 21,501 wash blocks have been successfully handed over to schools whilst construction work of 1,477 is ongoing. Table-1 below shows a summary of DPHE work where environmental screening was done.

Table 1: DPHE submitted Environmental Report Status

Installation/ Construction of	No. of Water Source/ Wash Block Covered in ES							
	Up to Dec'13	Jan'14- Mar'14	April'14 -Mar'15	April'15 -Sept'15	Oct'15- June'16	Jul'16- Dec'16	Jan'17- June'17	Total
Water Source	3,224	7,446	8,472	3,045	5,105	1,395	4034	32,721
Wash Block	1,107	4,732	8,293	3,892	2,681	754	1519	22,978

This report focuses on the construction work during the tenure of January 2017 to June 2017. During this period 4,034 Water Points have been installed and 1519 WASH Blocks have been constructed. The status of the water points and WASH blocks received through the monitoring survey is given in following subsections.

8.0 Environmental Monitoring: (Findings):

8.1 Water Sources

Only 3 types of water option are mentioned in DPP. These are DTW, STW and Tara TW. Due to variation in geological formation, aquifer /water table position, saline water intrusion etc. different water option is suitable for different area of the country. DPHE got approval of 7 new alternate water options other than DPP and started using them as piloting.

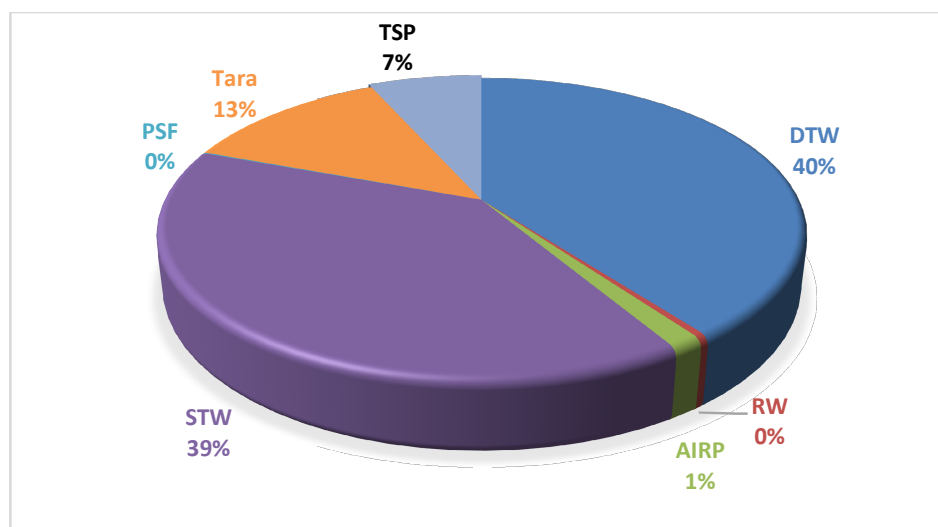


Figure 4: Distribution of Water Sources

As shown in Figure-4, out of 4,034 Water Points, about 40% is Deep Tube well, 13% is Tara and 39% is Shallow Tube well. In this tenure, 7% was installed as Tube well with Submersible Pump which was 31% in previous report. These water points have been installed or handed over in between January 2017 up to June 2017.

Of the total water options, 37.85% was installed in Rangpur Division which was only 3.58% in previous report. This is because about 1300 STW were installed in this division. In Dhaka & Chittagong the percentage decreased. The percentage of Dhaka division decreased from 24.8% to 13.89% and of Chittagong division from 24.09% to 12.00%. The percentage is decreased from 11.4% to 1.12% in Mymensingh division. The percentage is increased from 7.38% to 10.01% in Barisal division. The percentage of Khulna & Rajshahi remains almost unchanged. Spread of water points shown in Table-2 gives a detail picture.

The difference of share of tube wells in different divisions is due to the variation in size and coverage of particular division. However, care was taken in planning so that there have been no disparity in the hard to reach and poverty prone areas in getting sufficient water points.

It is revealed from the survey report that, in most of the divisions except for Rajshahi and Rangpur deep tube wells were the major water option. Requirement of deep tube well was found highest of 91.58% in Barisal whilst this percentage was 68.93% in previous report. Though in previous report, requirement of deep tube well in Chittagong was highest (77.38%) but now it is 76.45%. The percentage in Dhaka increased tremendously from 22.83% to 84.56%. The percentage in Mymensingh increased from 1.89% to 33.33%. The percentage in Sylhet was 56.25 but now it is increased to 86.96%. In Khulna also the



percentage increased from 52.74% to 67.47%. The percentage with respect to the total no of water points handed over within this tenure changes from 38.35% to 39.66%.

About 85.13% of the total tube wells have been installed as shallow tube well in Rangpur which was decreased from 96.00%. The percentage increased from 0% to 40.00% in case of Rajshahi. The percentage was 0% in Chittagong & Dhaka in previous report but now it is found 4.13% & 1.84% respectively. There was no STW in Sylhet division like the previous report. The percentage in Mymensingh division decreased to 0% from 17.61%.

Table 2: Distribution of Tube wells by their type and Administrative Division

Division	Count/ Percentage	DTW	STW	Tara	TW with Submersible Pump	RW	PSF	AIRP	Total
Barisal	Count	370	30	0	0	0	4	0	404
	% within Division	91.58	7.43	0.00	0.00	0.00	0.99	0.00	100.00
Chittagong	Count	370	20	90	0	4	0	0	484
	% within Division	76.45	4.13	18.60	0.00	0.83	0.00	0.00	100.00
Dhaka	Count	460	10	4	70	0	0	0	544
	% within Division	84.56	1.84	0.74	12.87	0.00	0.00	0.00	100.00
Khulna	Count	280	20	75	0	0	0	40	415
	% within Division	67.47	4.82	18.07	0.00	0.00	0.00	9.64	100.00
Mymensingh	Count	15	0	5	25	0	0	0	45
	% within Division	33.33	0.00	11.11	55.56	0.00	0.00	0.00	100.00
Rajshahi	Count	0	200	110	175	0	0	15	500
	% within Division	0	40	22.00	35.00	0	0	3	100.00
Rangpur	Count	5	1300	210	0	12	0	0	1527
	% within Division	0.33	85.13	13.75	0.00	0.79	0.00	0.00	100.00
Sylhet	Count	100	0	15	0	0	0	0	115
	% within Division	86.96	0.00	13.04	0.00	0.00	0.00	0.00	100.00
Grand Total	Count	1600	1580	509	270	16	4	55	4034
	% within Division	39.66	39.17	12.62	6.69	0.40	0.10	1.36	100.00

The percentage of Tara Tubewell decreased in almost every division from the last report due to the new technology i.e. Tubewell with Submersible Pump. The total percentage decreased from 19.86% to 12.62%. In previous observations Tube well with submersible pump was found only in Dhaka, Mymensingh and Rajshahi Division with a percentage of 77.17%, 64.78% and 34.86% respectively. Now the percentage found are 12.87%, 55.56% and 35.00% respectively. Overall percentage of Tube well with submersible pump decreased



from 30.90% to 6.69%. Ring wells were installed in Chittagong and Rangpur Division with a percentage of 0.40% compared to the total water points. 55nos. Arsenic Iron Removal Plants (AIRP) were installed in Khulna & Rajshahi Division. Figure-5 presents different type of tube wells in different divisions installed during the reporting period.

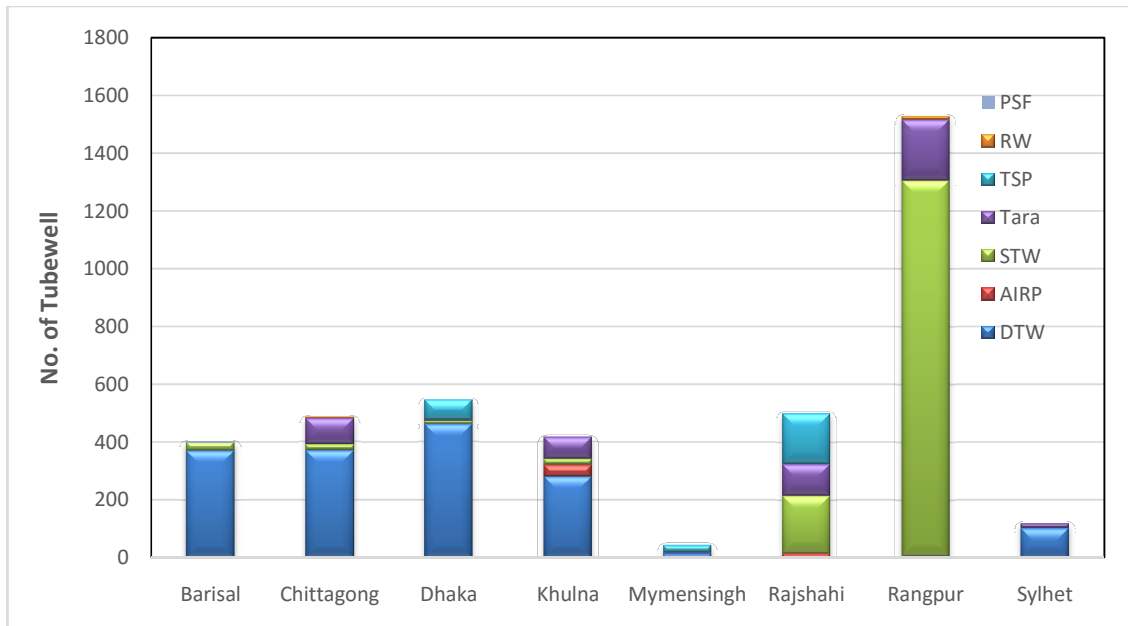


Figure 5: Division wise Water Points Distribution

8.1.1 Losses of Agricultural Lands:

During the preparation of site plan/ master plan it was the prime focus to ensure that in adoption of the new water supply facility does not preclude the use of existing agricultural lands. No loss of agricultural lands was received from the environmental screening survey conducted for the water points installed from January 2017 to June 2017.

8.1.2 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 would be referred to as 'Clean'.

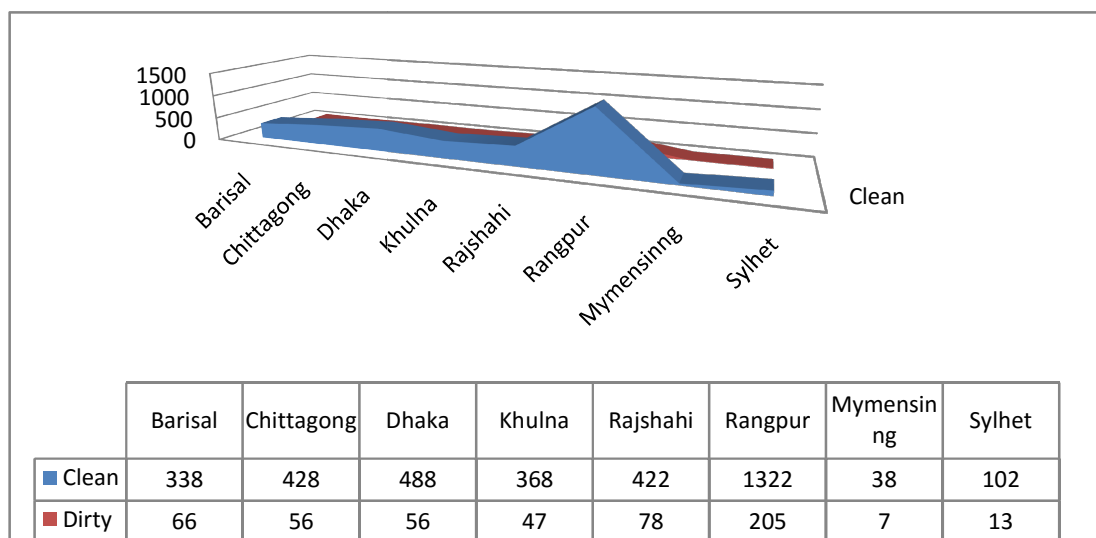


Figure 6: Division wise Environment of Water Supply Facility

In most of the cases environment have been found clean (86.91% of total 4,034). Out of 4,034 Water Points, environment of 13.09% are found dirty [Figure-7]. Water Points installed in Dhaka, Sylhet, Khulna, Rangpur, & Chittagong division have got mostly clean environment whereas, the worst condition (16.34%) is found in Barisal division. Though Barisal was found as worst condition division in last report also but the percentage is decreased. Worst case scenario for other divisions is in the range of 10.29-15.6%. Causes of dirty environment of water supply facility are improper drainage, growth of algae, dumping of waste near tube well, inadequate cleaning of platform etc.

Table 3: Environment of Water Supply Facility

Out come	Count/ Percentage	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Mymensingh	Sylhet
Clean	Count	338	428	488	368	422	1322	38	102
	Percentage	83.66	88.43	89.71	88.67	84.40	86.57	84.44	88.70
Dirty	Count	66	56	56	47	78	205	7	13
	Percentage	16.34	11.57	10.29	11.33	15.60	13.43	15.56	11.30

Mitigation Measures Suggested (MMS):

All the divisions have more or less minor environmental concerns. However, they were taken into consideration and mitigation measures were suggested during implementation and monitoring phase. Figure-7 & 8 shows that, because of taking mitigation measures during

planning and monitoring phase, Environment of water supply facility improves and thus reduces 98.44% of dirty environment.

It has been revealed that even after several caretakers' training, monitoring and routine maintenance, 1.56% of the water points sites were found unclean/dirty. However, the overall situation improves from the previous three of four submitted environmental reports (6%, 4% & 1.7% in the earlier reports) produced but close to the last report (1.45%).

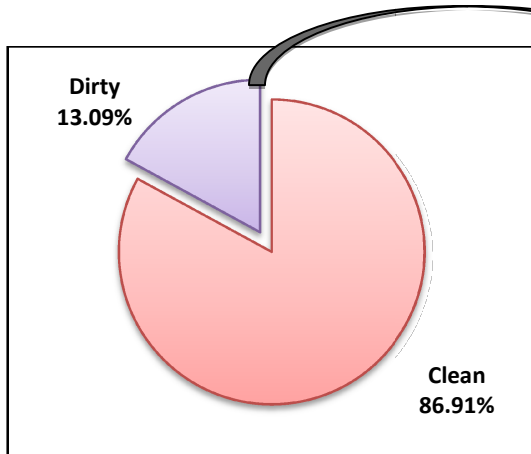


Figure 7: Environment of Water Supply Facility

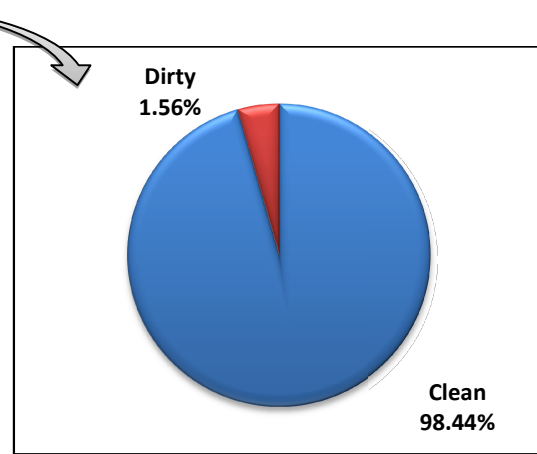


Figure 8: Impact after Implementation

8.1.4 Surface Water Pollution:

The water sources were installed in such a manner that they do not adversely pollute the surface water. The environmental screening of all 4,034 Water Points installed in between January 2017 to June 2017 revealed that they did not pollute any surrounding water bodies.

8.1.5 Facilities for Draining out of Water:

From the lessons learnt during the last four environmental reports, DPHE took initiative in solving the water logging problem by adopting different methods:

- 1) Piped out used water to the existing drains.
- 2) Construction of water collection basin having 50mm dia PVC washout pipe.

Table-4 shows the division wise scenario of water logging in the installed water points for the tenure January 2017 to June 2017. The schools of Barisal divisions were highest affected with water logging problem having a percentage of 6.68% out of total 404 water points installed in that division. Dhaka division were lowest affected with water logging problem having a percentage of 0.55% out of total 544 water points installed in that division. Other



divisions were found in a range from 1.45% to 5.44%. In the report for July, 2016 to December, 2016 Barisal was highest with a percentage of 6.8% of then installed water points whereas Dhaka was lowest with a percentage of 0.58%.

Table 4: Facilities for Draining out of Water

Out come	Count / %	Barisal	Chittagong	Dhaka	Khulna	Rajshahi	Rangpur	Mymensingh	Sylhet
Water Logging	Count	27	7	3	11	13	83	2	3
	%	6.68	1.45	0.55	2.65	2.60	5.44	4.44	2.61

As because, DPHE local office took initiative in solving the drainage issue, it has been observed that, the water logging problem is insignificant compared to the last three environmental reports. However, it is revealed that out of 4,034 water sources only 149 (3.69%) had the problems of water logging. The reasons observed are mainly 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 regular cleanliness program in the platform and drains.

8.1.6 Source of Water Supply:

During preliminary survey it was found that (Table-4), out of 4,034 schools 70.05% does not have their own water option. Of them 17.20% use the facility of their neighbourhood. The rest 52.85% does not have any option to collect water. Though 29.95% Schools have their own tube wells, yet those tube wells were found as non-functional or do not provide sufficient water during dry season.

Table 5: Source of Existing Water Supply

Sl. No.	Description of Existing Water Source	Nos.	Percentage
01	Tube well (non-functional/inadequate)	1208	29.95
02	Neighbourhood	694	17.20
03	No Water Source	2132	52.85
Total =		4,034	100

Mitigation Measures Suggested (MMS):

In order to address the issue of safe drinking water, water options were suggested and provided in all the schools as mentioned in Table 4. Accordingly tube wells were installed in different divisions as noted in Table 2 above.

DPHE tries to repair the existing tube well at first attempt. The 1,208 non-functional/inadequate tube wells as shown in table 4 were tried as well, but the attempt failed. Later on, new water points were suggested and installed as per suitable option.

8.1.7 Concern about water Quality:

During preliminary survey it was found that, out of 4,034 schools, 92 had concerns about water quality of existing sources. The concerns were mostly related to excess Iron and Chloride in drinking water. Based on geographic location and DPHE's experience, suitable water options were selected and subsequently provided in the schools as mentioned above.

Mitigation Measures Suggested (MMS):

After installation of new water point in the said 4,034 schools, laboratory tests were conducted to identify potential hazards of Arsenic, Iron and Chloride in water. The tests were done by the laboratory circle of DPHE and the reports are stored in the DPHE MIS database. [Copy of sample report is provided in Annex D of this report]. Figure below shows laboratory testing facilities of DPHE.



Figure 9: DPHE Zonal Laboratory setup for water testing

None of the said 92 newly installed water points by DPHE under PEDP-3 have any concern about water quality i.e., the arsenic, iron and chloride content were found below 50ppb, 10mg/l and 600mg/l (1000 mg/l in coastal belt) respectively. Tests were conducted in those schools during post monitoring phase by DPHE and third party appointed by DPE. The reports were found in the very closer range to the reports of DPHE laboratory test.

8.1.8 Arsenic, Iron & Chloride Contamination:

Out of 32,721 water sources (as shown in Table-1) as installed so far under this project, 512 had serious concern about water quality i.e., the arsenic, iron and chloride content exceeds 50ppb, 10mg/l and 600mg/l (1000 mg/l in coastal belt) respectively. The water quality of the installed water points in this tenure was found in allowable limit. Figure below shows the fact in details. As per MoU between DPE and DPHE, these water sources were not handed over to the primary schools.

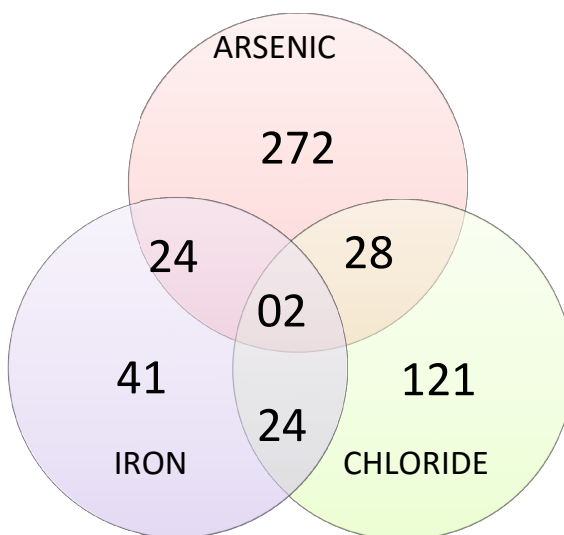


Figure 10: Arsenic, Iron & Chloride Contamination

Mitigation Measures Suggested (MMS):

In cases where arsenic/iron/chloride is found beyond allowable limit in installed water source, 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, AIRP etc. whichever is feasible.



Figure 11: AIRP & Sono Filter



In some cases 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 started implementing 'SONO Filter' As piloting DPHE implemented these options in the affected schools of Sylhet & Sunamganj district and AIRP in Meherpur, Chuadanga, Kushtia and Netrokona district. Figure of which is shown below.

8.1.9 Miscellaneous Observations:

During the implementation phase, two basic standards were maintained.

- 1) Ensure at least a distance of 10m between water points and leach pit/soak well/septic tank.
- 2) Ensure that the level of Platform is higher than the average flood level.

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

8.1.10 Summary of Observations:

For Water Options, it can be concluded that, the major concern is related to the environment of water supply facility and drainage of used water. Concerns due to quality of water and other factors are negligible because of the installation of new water point. Table 5 summarizes some other environmental issues observed during survey water points.

Table 6: Important Environmental Issues Observed

Issues/Environment Criteria	Findings from the Survey for all 4,034 TWs
Is the TW installed?	Yes
Is the existing TW working?	Yes
Is the handle of TW easy to operate?	Yes
Was TW water tested?	Yes
Is Arsenic<50ppb?	OK
Is Iron <5mg/l, for iron prone area up to 10 mg/l	OK
Is Cl≤600 mg/l, for coastal area up to 1000 mg/l	OK
Loss of agricultural land?	No
Negative effect on flora/fauna?	No
Conflicts with water supply right?	No
Health risk?	No

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 report in the MIS cell.



8.2 WASH BLOCK

Wash Block is serving as a unique unit of hygiene practice for the school children as well as for teachers. In our sense it has no bad impact on environment as it helps to promote hygiene as well as safe and clean school environment. Open defecations and urinal practices will be stopped and the washing facilities will ensure better health.

Table 6 represents the features of WASH blocks constructed in the primary schools of Bangladesh as per design. The male compartment is little larger compared to the female WASH block mainly because the inclusion of urinals. According to the design, sizes of male and female wash blocks are 164 sft and 136 sft respectively. Only except 2 urinals for the male WASH block, both have 3 toilets of which one is for the disabled children, 1 WASH basin, 1 foot washing system, 1 waste bin, Running Water Supply with Reservoir, Floor and Wall (3ft) Tiles, Mirror, Light and Ventilation etc.

Table 7: Elements of WASH BLOCK Provided

Male users' Wash Block(MT & BOYS)	Female users' Wash Block(FT & GIRLS)
Structural Features	
Size: 13'-6'' x 12'-1'' = 163SFT	Size: 13'-6'' x 10'-1'' = 136SFT
Separate entry	Separate entry
Floor and Wall (3ft) Tiles	Floor and Wall (3ft) Tiles
Sun Light and Ventilation as BNBC Code	Sun Light and Ventilation as BNBC Code
Proper electrification work as BNBC Code	Proper electrification work as BNBC Code
Sanitary Features	
2 nos. Urinals	
3 nos. Toilets (1 for disable students)	3 nos. Toilets (1 for disable students)
Foot Washing System	Foot Washing System
Waste Bin	Waste Bin
Hand Wash Basin	Hand Wash Basin
Mirror & Self	Mirror & Self
Towel Rail etc.	Towel Rail etc.
Water supply	
Running Water Supply with overhead Reservoir	Running Water Supply with overhead Reservoir
Tube-well with submersible pump	Tube-well with submersible pump
Disposal Features	
Septic tank and Soak well for adequate sewerage disposal	Septic tank and Soak well for adequate sewerage disposal
Special Features	
Child and user Friendly	Child and User Friendly
For disable students high commode and hand rail is provided	For disable students high commode and hand rail is provided
Ramp for disable students	Ramp for disable students
	Covered Bin & Rag cleaning facilities to address menstrual hygiene.



In total 1519 WASH blocks have been constructed in the primary schools under the PEDP-3 from January 2017 to June 2017. Out of these 1519 WASH blocks, 51 percent has been constructed for female users and the rest 49 percent for male users as shown in figure-13. It is however revealed from figure-14 that, 94% of total Wash Blocks have options for both Male & Female users (two types of wash block in same school), 5% are only female and 1% are only male.

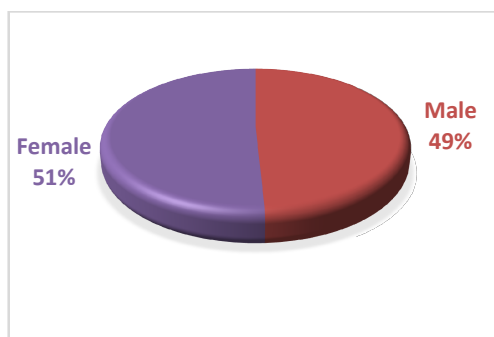


Figure 12: Distribution of Wash Block

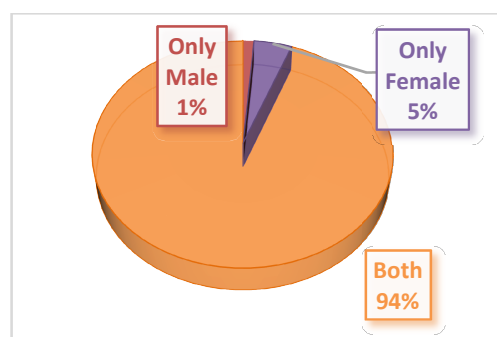


Figure 13: Detail Distribution of Wash Block

Table-8 shows division wise distribution of wash Blocks. It is apparent from the table that, most wash blocks have been constructed in Chittagong (522) division, whereas the situation is reverse in Sylhet (8) division.

Table 8: Construction of WASH Blocks in Different Administrative Divisions

Division	Total Districts within the Division	WB for Female Users		WB for Male Users		Total		Average No. Per District
		Count	%	Count	%	Count	%	
Barisal	8	102	50.25	101	49.75	203	100.00	25
Chittagong	10	265	50.77	257	49.23	522	100.00	52
Dhaka	13	128	52.67	115	47.33	243	100.00	22
Mymensing	4	81	51.59	76	48.41	157	100.00	26
Khulna	11	68	51.13	65	48.87	133	100.00	12
Rajshahi	6	100	48.54	106	51.46	206	100.00	34
Rangpur	4	24	51.06	23	48.94	47	100.00	12
Sylhet	8	4	50.00	4	50.00	8	100.00	1
Total	64	772		747		1519		24

In an average, 24 wash blocks have been constructed throughout the country from January 2017 to June 2017 which was 12 in last report. Dhaka, Khulna and Chittagong are the largest divisions in the country containing 13, 11 and 10 districts respectively. In three divisions, constructed WASH blocks are 243, 133 and 522 which are 16.00, 8.76 and 34.36 percent

respectively of the total WASH blocks constructed under PEDP-3 in this tenure. Average WASH blocks per district in these three divisions are 22, 12 and 52 respectively. The highest wash block per district is found in Chittagong division with 52 nos. whereas the lowest is found in Sylhet division with 1no. per district.

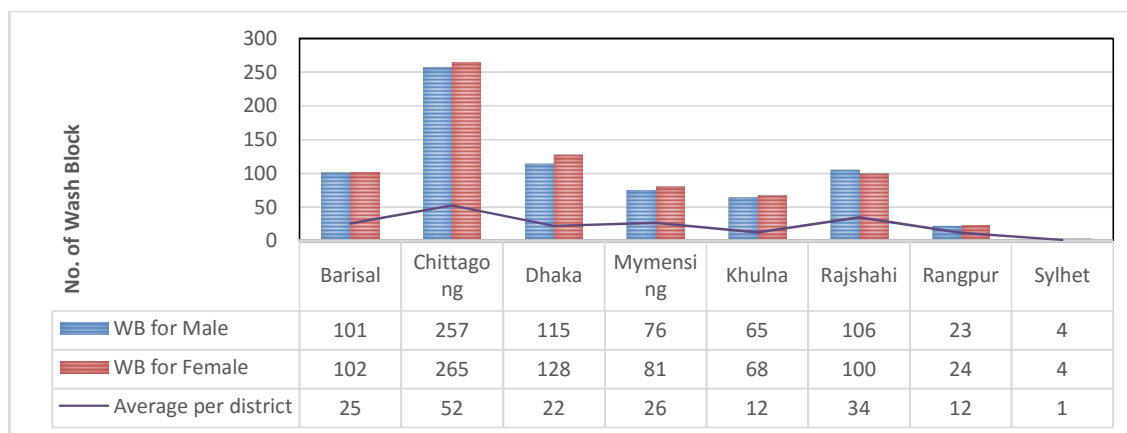


Figure 14: Division wise Wash Block Distribution

According to table 9, out of 1519 WASH blocks, only 2.76% has already been handed over to the schools. The rest 97.24% although already constructed has not yet been handed over until June 2017.

Table 9: Updated Status of Wash Block constructed in reporting tenure

Present status of wash block	WB for FT & Girls		WB for MT & Boys		Total	
	No. of WASH Blocks	%	No. of WASH Blocks	%	No. of WASH Blocks	%
Running	751	97.28	726	97.19	1477	97.24
Handed over	21	2.72	21	2.81	42	2.76
Total	772	100.00	747	100.00	1519	100.00

8.2.1 Type and availability of Existing Toilet:

As stated in Table-9, out of 782 schools, 45.80% did not have toilet facilities before. Though the rest 54.20% have toilet facilities, yet they were neither hygienic nor safe for the users. There are possible threats of spreading of pathogens and thus diseases.

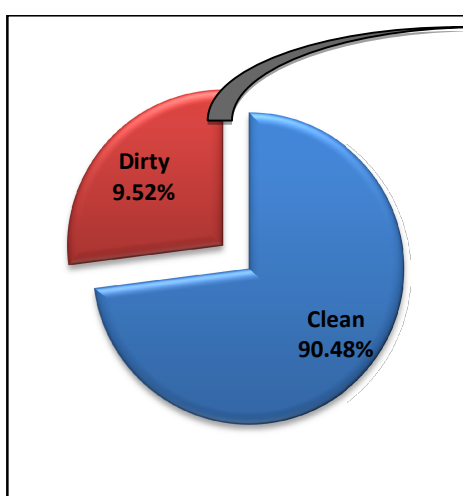
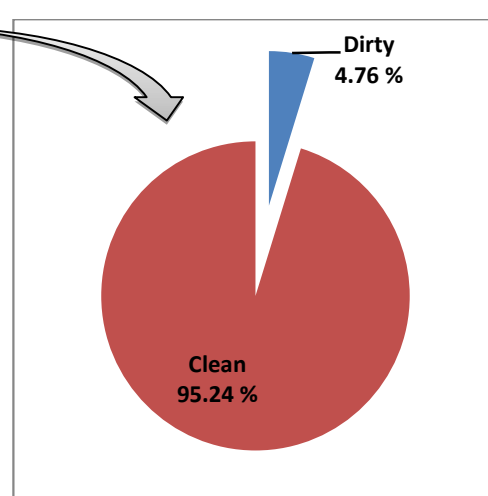
Mitigation Measures Suggested (MMS): In order to mitigate the problem related to lack of safe and adequate toilets, sufficient Wash Blocks were constructed in these schools as mentioned in Table-10 of this report.

Table 10: Existing Toilet Condition in Schools

Count/ %	No Existing Toilet	Single Pit Latrine	Double Pit Latrine	Total
Count	138	521	123	782
Percentage	17.65	66.62	15.73	100

8.2.2 Cleanliness of Wash Block:

It was found during the monitoring phase that, out of 42 handed over wash blocks, only 9.52% was dirty [Figure-16]. The major reasons of the unclean environment were less or no use of water, clogged drains, breaking of soil pipe, robbing of water tap, basin, pump etc.

**Figure 15: Cleanliness of Wash block****Figure 16: Impact after Implementation**

Mitigation Measures Suggested (MMS):

The schools having concerns about cleanliness, were taken into consideration and mitigation measures were suggested during implementation and monitoring phase. Upazilla level officers of DPHE such as Assistant Engineer, Sub assistant Engineer conducted through promotions and campaign in this regard. Figure-17 below shows that, Executive Engineer, DPHE, Bandarban is in a hygiene promotion campaign all the teachers of primary school. Figure-16 shows that, because of taking mitigation measures during implementation and monitoring phase, Cleanliness of Wash Block improves and thus reduces the percentage of dirty environment from 9.52% to 4.76% i.e. dirty environmental condition improves.



Figure 17: Executive Engineer, DPHE conducting Hygiene Promotion Campaign

It has been revealed that even after several caretakers' training, monitoring and routine maintenance, 4.76% of the Wash Blocks were found unclean/dirty in this tenure. This is a much improved condition in comparison to the earlier observed environmental reports. It is suggested that SMC should look after and pay proper attention in protecting the fixtures provided with Wash block and run regular cleanliness program.

8.2.3 Hand washing Facility:

None of the schools had hand washing facility prior to the construction of Wash Block. In wash block, hand washing facility is an in-built option and it was ensured at the time of construction of wash block. Moreover, steps have been taken to facilitate more hand washing facilities in the primary schools. In order to do so, wash basins with multiple water collection units were introduced. Water is collected by the installation of a deep tube well through submersible pump. Electricity is the key element to run such type of system. The water served in the water collection points are drinkable and free from pathogens and adverse ions. Figure-18 shows a multi-function water collection system. This system will not only enhance the hand washing facility but also help the student to solve their drinking water problem especially after mid-day meal.



Figure 18: Multiple user Hand Washing System

It was found during the monitoring phase that, even after providing hand washing facility, out of 42 handed over wash blocks, 4.76% (2 nos.) are out of operation. The major reason is theft of tap, submersible pumps etc.

Mitigation Measures Suggested (MMS):

DPHE ran extensive awareness program to the schools through its officers and staff. Moreover, during monthly and quarterly meeting officers from DPEO and UEO were informed about the scenario. During the post monitoring stage, it was found that, of the 4.76% wash blocks where hand washing facility was poor, improves and percentage drops down to 0% after mitigation measures taken from DPHE. It has to be kept in mind that, running water supply should be kept uninterrupted in order to continue the facility of hand washing.

8.2.4 Foot Washing Facility:

In each and every wash block, there exists a foot washing facility with a water point. During post construction monitoring phase, it was found that, of the handed over 42 WASH Blocks, all the foot washing facilities are running smoothly.

8.2.5 Construction Supervision & Quality Control:

Continuous construction supervision happens under PEDP-3 from DPHE by the officers from district and upazilla level. The main objective is to ensure that the construction is going on

based on approved layout plan and structural design without hampering the environmental and social safeguards. Figure-20 depicts the visit of DPHE's Engineer to a primary school from layout to roof casting including checking of major construction materials, checking of rebar binding and shuttering prior roof casting work.



Figure- 19: Construction Supervision From Lay Out to Roof Casting of Wash Block.

8.2.6 Production of Dust & Noise during Construction:

During the construction of wash block, there are four potential phases of dust generation.

- 1) During breaking of bricks
- 2) From Sand kept in open field
- 3) Preparation of mortar and Concrete
- 4) During casting work.

Since the volume of civil works related to construction is very low, generation of dust is also negligible. Moreover, prior to the construction works, following suggestion was made to the contractors.

- 1) Sands should be kept wet and kept covered
- 2) Dust produced from casting works to be removed instantly from site.



Because of the preventive instructions given prior to and during construction, almost no such events were observed.

WASH Block construction site has been taken as per the priority set in the comprehensive list approved by MOPME. It can be noted that the priority has been set following the number of students, availability of toilets etc. In future the construction site will be taken from live list prepared by validation process through software named PEPMIS (Primary Education Property Management Information System).

Construction of WASH blocks did produce noises but they are minimum and under tolerable limit. Major reasons of noise production are, use of mixture machine and vibrator machine during casting, during shuttering process, during tiles work etc. In order to overcome the situation and to keep the noise pollution under tolerable limit, Construction works related to noise were mostly done in weekends and after school hours.

8.2.7 Miscellaneous Observations:

Following table presents all the WASH Blocks constructed under PEDP-3 from January 2017 to June 2017 followed the environmental criteria as noted in the approved Environmental Guideline.

Table 4: Important Environmental Observations

Description	Findings	Male Users	Female Users	Total
Is the wash block user friendly	Yes	√	√	√
Provision for disabled	Yes	√	√	√
Running water supply	Yes	√	√	√
Washing facilities	Yes	√	√	√
Loss of agricultural land	No	X	X	X
Negative effect on flora/fauna	No	X	X	X
Deforestation?	No	X	X	X
Negative effects on ecosystem?	No	X	X	X



9.0 Lessons Learnt:

From the analysis of data found from Environmental Screening Forms for WASH Blocks & Water Points for the tenure the following steps should be taken to ensure quality and child-friendly infrastructure.

- 1) In the tenure the percentage of newly installed Tube well with submersible pump decreased from 31% to 7%. But due to the positive impact of multiple user water collection system by submersible pump, conversion of 2000 nos. previously installed TARA system Tube well from hand mode to mechanical mode is in progress. Because it was found more child-friendly and low maintenance required.
- 2) Government of Bangladesh is going to provide electricity connection in every GPS by 2018. In case of any GPS without electricity connection DPHE will arrange Solar system to ensure running water supply. It was found more environmental friendly.
- 3) Monthly intra-departmental co-ordination meeting in district level should be continued.
- 4) Quarterly inter-departmental co-ordination meeting in district level including UEO & DPEO representative should be continued.
- 5) Caretaker training during handover of Water Points and WASH Blocks should be continued.
- 6) Initiative should be taken increase the awareness among the Primary School students, teachers and states for hygiene practice, through campaign, workshop, leafleting, posturing etc.

10.0 Conclusions & Recommendations:

DPHE is the only government mandated department with a nation-wide institutional set-up for WASH. In every upazilla, DPHE has a full official set up headed by an Assistant Engineer (Civil) of twelve staffs comprising 1 Sub-Assistant engineer, 4 Mechanics, 5 other sanitation staff, 1 computer operator. Office of the Executive engineer, DPHE, in every district is fully dedicated to execute, maintain and monitor the work through Upazilla DPHE office.

DPHE has taken the responsibilities to ensure safe water supply, sanitation through WASH block or hygienic latrine for the students, teachers, staff and other potential users in the primary schools under the PEDP-3 project. Success of PEDP-3 depends on concerted efforts of various development and implementing partners such as DPE, LGED and DPHE. To



ensure safe water supply and sanitation for the school children and teachers are very significant as an important component for basic need and livelihood security.

Considering the importance of the component, DPHE may carefully deal with the following issues. For monitoring of any development initiative, targeted purpose and indicators are essential elements. MoPME with support from UNICEF has already developed “National Standards of Water Supply, Sanitation and Hygiene for Schools in Bangladesh”. Specific standards, their purposes and a set of indicators have been identified in this document. DPHE and DPE may use this document (particularly standards, purposes and indicators) for monitoring of water supply and sanitation issues being dealt by DPHE.

The MoPME document mentioned above also identified potential impact of WASH (Water, Sanitation and Hygiene education) in schools as

- (i) Improves children’s health
- (ii) Boost school attendance and achievement
- (iii) Promotes gender equality
- (iv) Reaches the community because ‘children are agents of changes’.

Considering the WASH impact in schools, DPHE had a strong focus not only to monitoring hardware components and its environmental screening but also to monitor software components particularly of health education, WASH practices, role of teachers and students in maintaining infrastructure set up not only the TW and WASH campus, but also in waste management and cleanliness of the campus.

With the routine, thorough, methodologically standard and result focused monitoring system it will now be possible to take corrective measures. As a result, expected benefits particularly at impact level may be achieved and expectation from the investment of scarce resource targeting WASH would be fruitful. However, in the monitoring process of DPHE, following particular measures needed further attention from DPHE and DPE.

- 1) One person should be appointed (on out-sourcing /part time basis) for each school (65000 manpower) to clean WASH Blocks regularly.
- 2) It is necessary to adopt a plan of monitoring as well as financial budgeting if any water source in primary schools other than PEDP-3 becomes defective. Similar plan is necessary for the tube wells within PEDP-3 project, where the defect liability period is over.
- 3) A need based maintenance Plan is required for the Wash Blocks after the defect liability period. A budget provision for routine maintenance of wash blocks and water source to be kept in favor of SMC.



- 4) It has already been found that the platform and drainage of a significant number of tube-wells are not satisfactory. The tube-well may discharge safe water but it is very much likely that due to unhealthy platform and drainage system tube-well and its water may be polluted. Preventive measures and awareness campaign should be run by SMC in regular intervals.
- 5) After installation of water sources and construction of wash blocks, the SMC has to ensure anti-theft measures to stop robbing of pump, water tap etc. for which the running water supply in Wash Block becomes interrupted.
- 6) Blanket screening of all the water points installed in primary schools is required, so that water quality can be monitored periodically.
- 7) The draft maintenance manual produced and submitted by DPHE require urgent approval and delivery to the schools. This would enable SMC to maintain the said infrastructures.



Annex A: New ESF Survey Format

Environmental Screening Format under PEDP-3 for Water Sources

District:

Upazilla:

Name of School:

School ID:

School Type:

Type of Water Sources:

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

Signature of SAE

Signature of AE

Signature of Executive Engineer



Environmental Screening Format under PEDP-3 for Wash Block

District:

Upazilla:

Name of School:

School ID:

School Type:

Type of Wash Block: MT+Boys / FT+Girls

Screening Questions	Base Line		Impact Without Intervention			Impact During Implementation			Impact after Implementation			Remarks
	Yes	No	+	-	N/A	+	-	N/A	+	-	N/A	
Environment of Existing Facility Good?												
Facilities for Draining out of Water Proper?												
Any Reported event of Spread of Pathogens?												
No. of Existing Toilet Adequate?												
Disposal of faecal waste safe?												
Disposal of liquid waste safe?												
Availability of Hand washing facility?												
Availability of Foot washing facility?												
Availability of Running water supply?												
Height of Wash blocks Appropriate?												
Any Loss of Agricultural Land?												
Any Negative effect on flora/fauna?												
Any provision for disabled?												
Is the wash block user friendly?												
Any negative effect on ecosystem?												

Signature of SAE

Signature of AE

Signature of Executive Engineer

Annex B: Tube well Case Study:

Case Study-01

Project	Third Primary Education Development Program (PEDP-3)
Name of School	Dolo Government Primary School
District	Habiganj
Upazilla	Sadar
Handed over	April, 2017
Caretaker Training	April, 2017
Monitoring from DPHE Local Office	Frequently during Installation
Post Construction Monitoring from Focal Point's Office	June, 2017

After installation of tube well, DPHE local office monitor the water quality and also will monitor functionality, use and cleanliness of the water supply facilities for at least two years after the handing over of the facility. If the water quality parameters are within allowable ranges, the tube-well is treated as a successful one. Then the platform including drainage is constructed as per standard design & specification. Tube well was installed in this school in 2017. During visiting time functionality of the tube well and cleanliness of platform was found ok and drainage facility was also monitored it was found ok. DPHE local office took initiative in solving these issues. Mechanics along with concerned contractor facilitated the drainage system and improved the environmental condition. However, even after taking mitigation measures, if the school drainage remain congestion. Then it is hence suggested that, SMC needs to look after this issue and run regular cleanliness program in the existing drains.



Figure-20: Water Source



The following aspects were considered during monitoring .

- Functionality of the tube well;
- Cleanliness of the platform and drains;
- Emergency contact to DPHE local office shortly

During post evaluation phase in June, 2017 the findings were found satisfactory and the water source was found functional.



Annex C: Wash Block Case Study:

Case Study-01

Project	Third Primary Education Development Program (PEDP-3)
Name of School	Bagmara Government Primary School
District	Moulvibazar
Upazilla	Kamalganj
Handed over	March, 2017
Caretaker Training	March, 2017
Monitoring from DPHE Local Office	Frequently during construction and twice (March & May, 2017) after construction
Post Construction Monitoring from Focal Point's Office	June, 2017

Wash Blocks for MT & Boys and FT & Girls were constructed in the above mentioned school during November, 2016 to February, 2017. The wash block was handed over to SMC. During Care Taker training regular cleaning and process how to clean of WASH Block was discussed. It was found during the first monitoring phase that WASH Block was dirty. The major reasons of the unclean environment were less use of water, clogged drains, breaking of soil pipe, robbing of water tap, basin, pump etc. The schools having concerns about cleanliness, were taken into consideration and mitigation measures were suggested during implementation and monitoring phase. The WASH Block has been monitored 2nd time after 2 months of hand over. It was found that The WASH Block was found clean. It is however suggested that SMC should look after and pay proper attention in protecting the fixtures provided with Wash block and run regular cleanliness program In each and every wash block, there exists a foot washing facility with a water point. Figure below shows the pictures were taken before cleaning and after cleaning during monitoring phase.

At the time of handover to SMC, Sub-Assistant Engineer, Kamalganj, Moulvibazar took initiative in giving caretaker training to the school. During caretaker training, following issues were covered:

- a) Proper use of wash block
- b) Hygiene practice
- c) Cleanliness & maintenance aspect
- d) Emergency contact to DPHE local office shortly



Figure 21: Before Cleaning



Figure 22: After Cleaning



The post monitoring visit on June, 2017 by SAE of Kamalganj Upazilla shows that the school is following the maintenance scheme properly.

