Enhance Youth Capacities on Gender Sensitive Climate Change Adaptation towards Sustainable Water Management in the Chitra-Nabaganga Area Water Partnership, Narail

Activity Report: January to June 2016







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Executive Summary

Climate change has crucial impacts on water resources and other environmental components. Moreover, its impacts are increasing day by day which lead scarcity of safe water availability. Bangladesh is one of the most climate vulnerable countries of the world. Climate changes and its impacts have been showing alarming adverse affects on safe water resources. But, safe drinking water is the basic right of every citizen and is vital for improving health. In adopting the Sustainable Development Goals (SDGs), countries have pledged to universal and equitable access to safe and affordable drinking water for all by 2030. Successful climate change adaptation and mitigation require appropriate knowledge, skills and behavioral change which can be provided by education.

The study was implemented by EPRC in financial collaboration with Bangladesh Water Partnership and Global Applied Network- South Asia (Garnet-SA). This is a small study to improved knowledge and builds capacity of youth from selected four secondary schools about the impacts of climate change and its adaptation and mitigation in safe water management and its use perspectives inside the Chitra- Nabaganga AWP at Narail district. The study included class room training followed by essay competition and information exchange workshop on "climate change adaptation and sustainable safe water management" among the school students. The class room training issues included: climate change (CC) and its impacts, adaptation to CC impacts, sustainable safe drinking water, water safety and its management, knowledge about water disinfection method during flood etc.

This study found that knowledge about water disinfection methods during flood, such as boiling arsenic free water (not contaminated water) and using chlorine solution for water disinfection improved to about 35% in end-line from baseline survey, significant at p: <0.0001. Level of knowledge improved significantly about preparedness for safe water during flood, sources of As free water, causes of climate change and its possible impacts at p: <0.0001. In some essays students included information on safe water technologies and their O&M during flood and normal situation. The integration of training and essay competition encouraged the students to further study the books as well as think about the lectured materials and collect information from other sources to prepare the essays.

Narail is the extended coastal area by highly arsenic contamination of ground water and salinity; deterioration its vulnerability risks to climate change impacts. Moreover, its impacts are increasing day by day which lead scarcity of safe water availability. The school text books include basic knowledge about the issues and have limited information about the real local contexts. The overall rates of improvement of knowledge among the students in final survey were significant as compared to those in the baseline survey. The rates of improvements, however, varied disproportionately over the various issues. The rate of improvement was low on some important issues, such as operation and maintenance of the safe water technologies, CC adaptation and other issues. Overall, about 1095 students were directly and indirectly benefited by the educational intervention of the project.

BWP-GWP and other development partners should be encouraged to undertake this kind of educational intervention in all parts of the country.

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List of Abbreviations

AWP Area Water Partnership

BWP Bangladesh Water Partnership

CN The Chitra-Nabaganga

COP The Conference of the Parties

DEO District Education Officer

EPRC Environment and Population Research Centre
GARNET-SA Global Applied Research Network-South Asia

GHG Green House Gas

GWP Global Water Partnership

IPCC Intergovernmental Plan on Climate Change

MDG Millennium Development Goal

MoEF The Ministry of Environment and Forest

NAPA The National Adaptation Programme of Action

NGO Non Government Organization

REDD Reducing Emissions from Deforestation and Forest

Degradation

SMC School Management Committee

UNFCCC United Nations Framework Convention on Climate

Change

USEO Upazila Secondary Education Officer

Introduction

1.1 Background

Climate change is progressing and will have widespread effects on human life and natural systems. Climate change is a key causative factor in increased heat waves, flooding, droughts, intense tropical cyclones, rising sea levels and loss of biodiversity. The IPCC scientists have provided tangible evidences on climate change due to increased human activities and development. The average number of disasters caused by natural hazards has increased in the last 20 years from 200 a year to more than 400 today and this is predicted to increase by as much as 320 percent in the next 20 years. There are two main strategies to address climate change: mitigation and adaptation. Mitigation focuses on interventions to reduce greenhouse gas (GHG) concentrations through measures that cut GHG emissions or move carbon out of the atmosphere, which can range from investment in clean energies to forest conservation. On the other hand, Adaptation – reducing the vulnerability of natural and human systems to the impacts of climate change and adapting to a changing climate through adjustments in social, ecological or economic systems – is also essential (Allison, 2010 and Das, 2010). SDG set target-13.3 for "improve education, awareness-raising and human and institutional capacity on climate change mitigation, adaptation, impact reduction and early warning by 2030".

"Education alone cannot achieve a more sustainable future; however, without education and learning for sustainable development, we will not be able to reach that goal" –UNESCO

Children are powerful agents of change, and studies have found that many children can be extraordinarily resilient on the face of significant challenges. Providing children with empowering and relevant education on disasters and climate change in a child-friendly school environment can reduce their vulnerability to risk while contributing to sustainable development for their communities. Goodman et al. (2011) suggest REDD (Reducing Emissions from Deforestation and Forest Degradation) projects as a critical strategic opportunity. They recommend school-based integrated educational approaches which empower young people to build better future through life-sustaining values, practical skills and knowledge (HEART, 2013). Successful climate change adaptation and mitigation require appropriate knowledge, skills and behavior change that education can provide. Specifically, education can enable individuals and communities to make informed decisions and take action for climate resilient sustainable development. Two major climate treaties, the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol, have articles calling on governments to support education for climate change. This is complemented by the focus on education and knowledge as a priority for risk reduction within the Hyogo Framework for Action: Building the Resilience of Communities and Nations to Disasters, 2005-2015 (Allison, 2010).

The coastal areas of Bangladesh is different from rest of the country not only because of its unique geo-physical characteristics but also for different sociopolitical consequences that often limits people's

access to endowed resources and perpetuate risk and vulnerabilities. Coastal areas include coastal plain islands, tidal flats, estuaries, and offshore waters. It extends to the edge of a wide (about 20 km) continental self. This coastal area represents an area of 47,211 km2, 32 percent of the country's geographical area (Shamsuddoha and Chowdhury, 2007).

According to the Fourth Assessment Report of IPCC, South Asia is the most vulnerable region of the world to face the climate change impacts. The international community also recognizes that Bangladesh ranks high in the list of most vulnerable countries on earth. Bangladesh's high vulnerability to climate change is due to a number of hydro-geological and socio-economic factors that include: (a) its geographical location in South Asia; (b) its flat deltaic topography with very low elevation; (c) its extreme climate variability governed by monsoon which results in acute water distribution over space and time; (d) its high population density and poverty incidence and (e) its majority of population being dependent on crop agriculture which is highly influenced by climate variability and change. It will create new negative impacts in almost all sectors, in addition to complicating and intensifying those existing problems (Abu Hassan *et al.* 2012). Despite the recent strides towards achieving sustainable development, Bangladesh's potential to sustain its development is faced with significant challenges posed by climate change. It is therefore of utmost importance to disseminate and educate about climate change impacts and mitigation among school students.

The National Adaptation Programme of Action (NAPA) is prepared by the Ministry of Environment and Forest (MoEF), Government of the People's Republic of Bangladesh as a response to the decision of the Seventh Session of (COP7) of the United Nations Framework Convention on Climate Change (UNFCCC). Inclusion of climate change issues in curriculum at secondary and tertiary educational institution (MoEF, 2005).

There are approximately 70,000 primary schools and 17000 secondary schools in Bangladesh. More than 20 million students are enrolled in the primary school. According to an UNICEF assessment in primary schools about 53% have functional safe water tube well and the rest does not have any option or have non-functional options. Moreover, there are alarming questions about the quality of drinking water and hygienic practices existing in many schools of Bangladesh (arsenic, salinity, bacteriological and other contamination) [Hoque *et al.*, 2011].

Safe drinking water is the basic right of every citizen and is vital for improving health and in alleviating poverty. In adopting the Sustainable Development Goals (SDGs), countries have pledged to universal and equitable access to safe and affordable drinking water for all by 2030" -SDG 6.1. Bangladesh is a diarrhea epidemic prone country and contaminated water related epidemics are common. Health Statistics indicate that approximately 342 children are dying every day for causes which are associated with exposure to contamination risks related to lack of safe drinking water. Therefore, it is important and urgent that climate change adaptation related to sustainable safe drinking water be promoted in all sectors and through all major partners/institutions. Schools have been identified as a

main partner in promoting surface water and drinking water, health and other basic issues, in addition to the fact that it needs of capacity building.

This report presents results of a brief study on Enhance Youth Capacities on Gender Sensitive Climate Change Adaptation towards Sustainable Water Management in the Chitra-Nabaganga Area Water Partnership, Narail District Bangladesh.

1.2 Objectives

The objective of the present study is to enhance capacity of school youths from the selected four secondary schools focusing gender response CC adaptation towards sustainable water management inside the Chitra - Nabaganga AWP at Narail district.

The specific objectives are:

- i) improve knowledge among the school students (youths both boys and girls) about gender response climate change adaptation and sustainable water management through class room training and workshop;
- ii) enhance knowledge of local organization members;
- iii) arrange a information exchange activities through essay competition among the students of the selected schools; and
- iv) disseminate the essay competition outcome thru a district level workshop.

Methodology

2.1 Design

The project design adopted educational intervention based on observational longitudinal method. The selected safe water management and climate change issues include: climate change (CC) and its impacts, adaptation to CC impacts, sustainable safe drinking water, water safety and its management, methods of water disinfection during flood. Combined qualitative and quantitative methods of data collection were implemented. Field activities of the project were carried out over a period of six months. A schematic diagram of the project profile is given below:

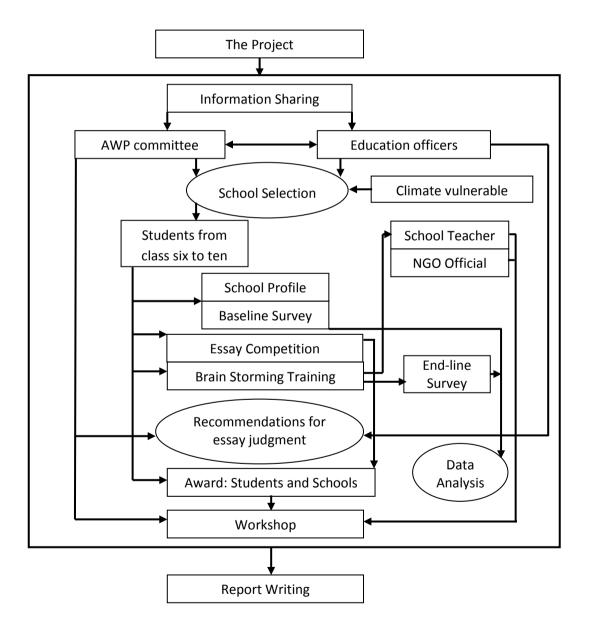


Figure 2.1: Schematic diagram of the research methodology

2.2 Study Area

The project was conducted at selected four schools located inside Chitra-Nabaganga AWP in Narail Sadar sub-districts under Narail district. The project areas are presented in the Figure 2.2. Reportedly both the social and environmental situations of the selected sub-districts are vulnerable.

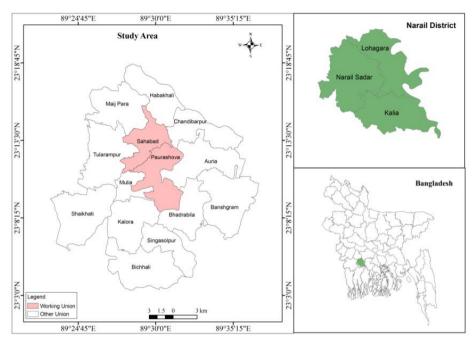


Figure 2.2: Locations of the study areas

2.3.1 Method of School Selection

Four schools have been selected inside Chitra-Nabaganga AWP in Narail Sadar under Narail district based on consultation with district education officer and sub-district secondary education officer. The four schools represented areas at risks from arsenic, salinity and flood problems. The headmasters of the schools were contacted about their interests before finalizing the schools. Selected schools are –

- a) Paura Secondary School;
- b) Rupganj Secondary Girls School;
- c) B.R.D Adarsha Secondary School; and
- d) Shahabad Secondary School.

Total number of the student of the schools is about 1095 including 32.0% boys and 68.0% girls. There are 53 teachers including 30 male and 23 female.

2.3.2 Educational Intervention

The educational intervention mainly included lectures and demonstration among students at selected schools through training. Total 480 students including 200 boys and 280 girls and 18 teachers of the selected four schools were participated in the class room training. The class groups were six to ten in

each school. The training session included climate change (CC) and its impacts, adaptation to CC impacts, sustainable safe drinking water, water safety and its management, methods of water disinfection during flood.

A day long workshop entitled 'Climate Change Adaptation and Sustainable Safe Water Management'; Chitra-Nabaganga Area Water Partnership in Narail District was organized among students, teachers, guardian, area water partnership committee members, District Education Officer, Upazila secondary education officer, NGO personnel and media representative. The workshop was divided into 2 sessions such as (a) discussions and recommendations, and (b) prize giving ceremony. Training manual and guideline provided by EPRC were used during the training period while Multi-media were used during the workshop.

2.3.3 Monitoring and data collection

A baseline and end-line survey was carried out in every school. Baseline and end-line surveys were done among 100 students (25 from each school). The information was collected on the basis of multi-disciplinary variables, such as knowledge on safe water, water disinfection during flood, impacts of climate change, hygienic latrine, etc. The survey was conducted among the students of class six to ten. Randomly five students have been selected for baseline survey from each class. Advanced statistical software Statistical Package for the Social Sciences (SPSS) 17.0 and Microsoft Excel were used for data management and analysis.

2.3.4 Workshop

A workshop on 'Climate Change Adaptation and Sustainable Safe Water Management: Chitra-Nabaganga Area Water Partnership in Narail District' has been organized under the study activities with the technical support of GARNET-SA in 17 August 2016 at Narail Sadar. Nominated first, second and third position awarded students in essay competition, best school, other schools and all other students were awarded in the workshop. EPRC personnel presented keynote paper in the workshop on climate change adaptation and safe water management. Moreover, students asked their various queries about the issues in the open discussion session to the expert panel and filled up their gaps.

2.4 Main Activities

The main activities of the project included:

- School selection and planning for the intervention with the concerned teachers, DEO, USEO,
 AWP committee and EPRC local staff;
- Conducted baseline and end-line survey on the level of knowledge and related practices among the students of the selected four schools;
- Announced essay competition in the selected schools;

- Developed of educational materials e.g. training manual, presentation based on EPRC documents;
- Planned and implemented training/educational session among the students and teachers;
- Collected the essays written by the students from the schools;
- Evaluated the collected essay and selected first, second, and third position among the participants as well as best school and other school from the participated schools;
- Arranged workshop on the climate change adaptation and safe water management in the Chitra-Nabaganga Area Water Partnership in Narail District;
- Presented paper in the workshop and awarded prize to the first, second, and third position holder essay competitor students and other students as well as best school and other schools;
- · Conducted data coding, entry, cleaning and analysis;
- · Prepared progress and end-line report;

2.5. Management

The project was implemented by EPRC. EPRC is a multi-disciplinary research, education, training and networking non-government and not-for-profit organization. Its vision is to redress the sufferings of the poor people through appropriate management/development of water, hygiene, sanitation, agriculture, forestry, energy, food, disaster risks, education, health and social scopes in local, regional and global levels. The strategic objectives include research and development of knowledge, technology, human resources, natural resources, institutions, monitoring and evaluation policy in its fields of interests. It has been working in the fields of environment, water, education, agriculture, hygiene, health, food security, disaster risks management and its related social and policy issues. In addition, EPRC supports and co-educates post graduate students from Universities in Bangladesh and other countries.

Results and Discussion

3.1 Characteristics of the Selected Schools

The project has directly and indirectly educated about 1095 students and 53 teachers. The selected schools were from flood, arsenic contamination and salinity problem areas of Narail Sadar sub-district of Narail. The following Table summarizes the characteristics of the schools.

Table 3.1: Summary of selected characteristics of the project schools

SI.	Cahaalmama	# of Stu	udents
No.	School name	Boys	Girls
01	Paura Secondary School	159	165
02	Rupganj Secondary Girls School	0	287
03	B.R.D Adarsha Secondary School	92	130
04	Shahabad Secondary School	104	158
	Total	355	740

All the four schools were secondary non-government high school with MPO registration. In total there were about 1095 including 32% boys and 68% girls. The selected sub-district and schools are exposed to the risks for arsenic contamination and salinity in ground water as well as flooding. Indeed, all schools located inside the Chitra-Nabaganga Area Water Partnership (CN-AWP).

3.2 Level of knowledge

a) Water disinfection

Nothing makes clearer the importance of water than a large disaster; clean, fresh water becomes more valuable than gold. It's easy to forget that without water, we can't survive. 60 percent of our body is water, in fact for infants, water makes up about 80 percent of their body, so it is even more vital they have access to clean drinking water (Carlo Morelli, 2006).

Total 100 and 100 students of the selected four schools were interviewed in the baseline and end-line survey respectively. Knowledge about water disinfection methods during flood, such as boiling arsenic free water (not contaminated water) and using chlorine solution for water disinfection improved to about 35 percentage points in end-line from baseline survey. The improvement significantly differed in end-line from baseline at p: <0.0001 (Table 3.2).

Table 3.2: Water disinfection during flood (three responses)

Responses	Baseline (%)	End-line (%)	P-value
N	100	100	
- boiling As free water	45	80	<0.0001
- using chlorine solution	14	49	<0.0001

b) Preparedness for safe water during flood

Disease transmission from contaminated water occurs principally by ingesting water. Water disinfection is accomplished most effectively with a chlorine-containing chemical.

Table 3.3: Preparedness for safe water during flood (three responses)

Responses	Baseline (%)	End-line (%)	P-value
N	100	100	
- keep chlorine solution in house	3	63	<0.0001
- keep plastic container in house	12	33	0.0007
- keep water pot beneath the soil	10	16	0.29
- remove TW head and plugging mouth	7	42	<0.0001
 keep dry wood/cooking materials for boiling in house 	0	24	<0.0001
- raising TW pipe	10	28	0.002
- keep alum (fitkari)/bleaching powder in house	22	70	<0.0001

Thus, keeping chlorine solution is an important preparedness method of getting safe water during flood. Knowledge about the preparedness methods of getting safe water during flood such as keeping chlorine solution in house improved to about 63% in end-line survey from only 3% in baseline. The improvement significantly differed in end-line from baseline at p: <0.0001 (Table 3.3).

c) Sources of As free water during flood

About 19 percent surveyed students didn't know the methods of getting arsenic safe water during flood. Final survey result disclosed that surveyed students from the selected schools are known rain water (73%) and deep tube well (41%) water as the way of getting arsenic safe water during flood at present. Class room training among the selected schools has improved the level of knowledge of the students about sources of arsenic free water improved significantly at <0.0001.

d) Causes of climate change

Students of the selected schools were asked about the cause of climate change during baseline and end-line survey. It is explored that half of the students didn't know why climate is changing or causes of climate change. Only 14% student indentified increasing nature of Green House Gases (GHG) is the main cause of climate change while it is improved to 92% in end-line survey. The improvement is significantly differed in end-line from baseline at p: <0.0001 (Table 3.4).

Table 3.4: Causes of climate change (three responses)

Impacts on agriculture	Baseline (%)	End-line (%)	P-value
N	100	100	
- Increase of Green House Gases (GHG)	14	92	<0.0001
- Deforestation	22	94	<0.0001
- Others	28	1	<0.0001
- Don't know	52	0	<0.0001

e) Impacts of climate change

Knowledge about impacts of climate change is improved significantly (p: <0.0001) after class room training conducted among the students of the selected schools. Knowledge about the impacts of climate change such as saline water intrusion improved to about 28% in end-line survey from almost 'nil' in baseline. The improvement is significantly differed in end-line from baseline at p: <0.0001 (Table 3.5). The detail information regarding the responses about the possible impacts of climate change in Bangladesh is presented in table 3.5.

Table 3.5: Impacts of climate change (multi responses)

Impacts on agriculture	Baseline (%)	End-line (%)	P-value
N	100	100	
- Increase flood frequency and intensity	4	84	<0.0001
- Increase drought	14	91	<0.0001
- Increase arsenic in ground water	0	43	<0.0001
- Saline water intrusion	0	28	<0.0001
- Increase cyclone frequency and intensity	21	27	0.406

3.3 Essay Competition

An essay competition was organized among the students of four selected schools of Narail district. The selected topic of the essay was 'climate change adaptation and sustainable safe water management'. The essay was of 800 words. Students from the classes of 6 to 10 of the selected schools took part in the essay competition. The total number of 75 students took part in the essay competition (Table 3.6). Among them 2 first and 2 second students (one from vi-viii class and one from ix-x class) were awarded first prize (prize money and crest) and 10 were awarded crest for securing 3rd position (five from each class group). The best and other participated schools were awarded with crest.

Table 3.6: Participants in essay competition

Name of School	Class		Overall
	6-8	9-10	
N	46	29	75
Shahabad Secondary School	14	9	23
Paura Secondary School	15	10	25
B.R.D Secondary School	15	10	25
Rupganj Secondary Girls School	2	0	2

Total 75 students were participated in essay competition from the selected four schools including Shahabad Secondary School 23 (boys-8; girls-15), Paura Secondary School 25 (boys-7; girls-18), B.R.D Secondary School 25 (boys-8; girls-17), and Rupganj Secondary Girls School 2 (girls-2) (Table 3.6).

Table 3.7 shows class group and school wise winner in essay competition. Among the participated four schools, Shahabad Secondary School got one first, one second and one third prizes; Paura Secondary School got one first, one second and six third prizes; B.R.D Secondary School got two third prizes; and Rupganj Secondary Girls School got one third prize. Paura Secondary School was selected as the best school in the essay competition based on number securing first, second and third prizes and vote of the essay evaluation committee.

Table 3.7: Essay competition result

Name of Schools	Class Group		Grade	Score
	6-8	9-10		
Shahabad Secondary School	1c	1a, 1b	1a+1b+1c	1+3+2=6
Paura Secondary School	1a, 1b,2c	4c	1a+1b+6c	3+2+6=11
B.R.D Secondary School	1c	1c	2c	2
Rupganj Secondary Girls School	1c	-	1c	1

Note: a=first=3, b=second=2, c=third=1

3.4 Workshop

The workshop was arranged to exchange and share the knowledge and build up the capacity of young school children, teacher, NGO personnel about climate change, its adaptations, mitigations, sustainable safe water management and its usage perspectives. In total 37 participants including the DEO, USEO of Narail; Chair of Area Water Partnership, Narail; Media Professional, NGO representatives, Headmasters, other teachers, students and guardians of four selected schools of Narail district participated in the workshop.

The main objectives of the workshop were (1) to discussion on workshop topic: Climate change adaptation and sustainable safe water management by the resource panel; and (2) to give prizes

among the winners students of selected four schools situated inside the basin of Chitra and Nabaganga who took part in the essay competition.

Md. Abubakkor Siddik, Assistant Research Coordinator, EPRC has presented the key note on Climate change adaptation and sustainable safe water management. In his speech, Mr. Siddik mentioned that the global warming is one of the main causes of climate change. He pointed out that Bangladesh is one of most vulnerable climate change affected country of the world and as a result of climate change the average temperature of Bangladesh is in an increasing trend which is alarming for the living and



plant of the world. Mr. Siddik mainly focused on salinity, cyclone, flood, sea level rise, arsenic, drought and its association with climate change as well as consequence on sustainable safe water management and possible strategy for overcoming the problems. He has shown several drinking water technologies to be used during flood or non-flood period.

The participants highly appreciated the research activities carried out by EPRC in collaboration with BWP. They strongly recommended to continue the training program over the year for sustainable improvement in those schools and to extend this program to other schools as well.

Conclusion and Recommendations

Overall, about 1095 students were directly and indirectly benefited by the educational intervention of the project. The level of basic sustainable safe water management & Climate Change Adaptation and its related functions were found poor before the intervention. The study reconfirmed that rates of knowledge, attitude and practices (KAP) about Climate Change Adaptation and Sustainable Safe Water Management as well as its related issues among the students and teachers can be improved significantly (p: <0.0001) after simple educational intervention as observed earlier.

4.1 Conclusions

The following main conclusions can be drawn:

- i. The overall rates of improvement of knowledge among the students in end-line survey were significant as compared to those in the baseline survey. The rates of improvements, however, varied disproportionately over the various issues. The rate of improvement was low on some important issues, such as operation and maintenance of the safe water technologies, CC adaptation and other issues.
- ii. The students were not more aware about sustainable safe water management before the intervention. They had some knowledge about climate change and its impacts as included in their text books. Both the level of knowledge improved significantly after the educational intervention.
- iii. The teachers, members of school management committee and District Education Officer, Upazila Secondary Education Officer, local NGO representative appreciated the result of the educational project. Media coverage the district level workshop showing the importance the project and the issues.

4.2 Recommendations

The main recommendations are as follows:

- 1) School should create awareness inside its catchment through student cabinet and user group.
- 2) The teachers should establish and monitor safe water & technology management facilities at the schools and encourage the students to maintain WSPs properly.
- 3) The schools with government and non-government partners should arrange competition regarding climate change, safe water management, homestead waste management, hand washing/sanitation on environment, hand wash, sanitation and other designated days.
- 4) IEC material is needed for creating awareness at school level.
- 5) Next phase of this program should undertake in Kalia Upazila, proposed by DEO, USEO, Chair AWP, and participants.

BWP-GWP and other development partners should be encouraged to undertake this kind of educational intervention in all parts of the country.

Reference

- Abu Hassan, M. Wazed, Sufia Khanam and Bilqis H. Amin. 2012. Environmental Health and Climate Change Adaptation Capacity Building among Schools in Disaster Prone and Arsenic Affected Area, Narail, Bangladesh. Submitted to BWP.
- 2. Allison Anderson 2010. Combating Climate Change through Quality Education. Policy Brief 2010-03. Global Economy and Development at Brookings. The Brookings Institution, Washington, Dc 20036.
- Carlo Morelli, 2006. Disaster Preparedness: How to Get Safe Drinking Water in an Emergency. Available at: http://ezinearticles.com/?Disaster-Preparedness:-How-to-Get-Safe-Drinking-Water-in-an-Emergency&id=135286
- 4. Das, P.K., 2010. Climate Change and Education Bangladesh. Available at www.preventionweb.net/files/16355_climatechangeedbangladesh.pdf
- 5. Health & Education Advice & Resource Team (HEART), 2013. Helpdesk Report: Educational Systems and Climate Change.
- 6. Hoque, B.A., Khanam, S and Salam, 2011. Action Research and Training Programs on Sustainable Development of Basic Environmental Health. Research Report of EPRC and submitted to Tide Foundation, USA.
- 7. IPCC, 2007. IPCC Fourth Assessment Report: Climate Change 2007. Available at:https://www.ipcc.ch/publications_and_data/ar4/syr/en/mains1.html
- 8. Ministry of Environment and Forest (MOEF), 2009. The National Adaptation Programme of Action (NAPA), Government of the People's Republic of Bangladesh.
- Shamsuddoha, M., and Chowdhury, R.K., 2007. Climate Change Impact and Disaster Vulnerabilities in the Coastal Areas of Bangladesh. Available at http://www.unisdr.org/files/4032_DisasterBD.pdf

Appendix-I

Conducted training session under the project

















Appendix-II

Organized training workshop under the project



Chief Guest: Mr. Naresh Chandra Das, District Education Officer, Narail



Chair: Mr. Md. Rawsan Ali, Principal of Birsresto Nur Mohammed College, Narail and Chair of AWP



Sepcial Guest: Md. Fazlul Haque, Upazila Secondary Education Officer, Narail Sadar



Key note by Md. Abubakkor Siddik, Assistant Research Coordinator, EPRC



Teacher Participation in Open Discussion



Teacher Participation in Open Discussion





Essay Competitor Speech on the topic



Best School



First: Nine-Ten Group



First: Six to Eight

Appendix-III

List of participants in the workshop

SL	Name	Desig.	Organization	Mobile No
	Naresh Chandra Das	DEO	District Education Officer	01927655761
02	Md. Rowshan ali	Principal &	Principal & Birsrestho Nur Mohammad Collage 0	
		Chairperson	Area Water Partnership (AWP)	
03	Md. Fazlul Haque	USEO	Education Office	01715635294
04	Md. Abubakkor Siddik	Assist. Research Coordinator	EPRC, Dhaka	01680277317
05	Khohinur Akter	Executive Director	NNUS	01715668420
06	Md. Shohel Rana	Director	KSS	01716121794
07	Ruhul Kuddus	Project Coordinator	ASS, Narail	01710785115
80	Taposh Kumer Guha	Program Officer	Nobanna	01922625125
09	Sopon Kumer Das	District Representative	The Daily Bhorer Pata	01739251515
10	Md. Al Amin	District Representative	Jay Jay Din and Somajer Khotha	01712275204
11	SM Zia	District Representative	Amader Orthonity	01917240799
12	Tapan Kumar Biswas	Head Mmaster	Rupgonj Secondary Girl School	01911655601
13	Shibpad Paul	Assist. Teacher	B.R.D Adarsha Junior High School	01931811898
14	Md. Shoriful Islam	Assist. Teacher	Shahabad Secondary School	01913348516
15	Birendro Nath Bosak	Head Master	Shahabad Secondary School	01724958828
16	Khohinur Akter	Assist. Head Master	Pauro Secondary School	01718870370
17	Pankaj Roy	Assist. Teacher	Pauro Secondary School	01921500293
18	Alif Hossain	Student	Pauro Secondary School	01927893720
19	Moriam Khatun	Student	Shahabad Secondary School	01925330475
20	Hera Khanom	Student	Pauro Secondary School	01927893720
21	Arpa Khatun	Student	Shahabad Secondary School	01775277332
22	Rani Biswas	Student	Rupgonj Secondary Girl School	01911655601
23	Md. Farhad Shaikh	Student	Shahabad Secondary School	01794271014
24	Shatabdi Paul	Student	B.R.D Adarsha Junior High School	01931811898
25	Shirina Akter Srabony	Student	Pauro Secondary School	01937860955
26	Rocksana Aktar	Student	Pauro Secondary School	01864042705
27	Arpita Paul	Student	B.R.D Adarsha Junior High School	01931811898
28	Sobuj Sheikh	Student	Pauro Secondary School	01982447113
29	Basona Roy	Student	Pauro Secondary School	01733464833
30	Srabony Alom Happy	Student	Pauro Secondary School	01936044030
31	Mita Biswas	Student	Pauro Secondary School	01720459128
32	Md. Mohidul Islam	Student	Victoria College	01956159331
33	Md. Farhad	Guardian	Shahabad Secondary School	
	Lipi Begum	Guardian	Shahabad Secondary School	
35	Md. Amzad Hossain	Area Coordinator	ASU Project, EPRC, Gopalganj	01713901829
36	Md. Nurunnabi	Union Supervisor	ASU Project, EPRC, Gopalganj	01740591461
37	Md. Alhaj	DemocracyWatch		01700596060