

Workshop on  
**MARVELLOUS MANGROVES CURRICULUM  
IN BANGLADESH**



Brief Report

## Workshop on MARVELLOUS MANGROVES CURRICULUM IN BANGLADESH

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Implemented by



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## INTRODUCTION



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The Marvellous Mangroves (MM) Curriculum is a 350-page guidebook for schoolteachers, environmental clubs and higher level students to get intensive knowledge on mangroves through theoretical knowledge, hands on activities and visit to the wetlands including mangrove forests. The book has five chapters namely: All about Mangroves, Mangrove as Habitat, Human Impact on Mangroves, Exploring Mangroves and Making Changes. Each of the parts contain a detail introduction, fact sheets, illustrations, hands-on activities and field trips so that the students can get deep knowledge and conduct primary research on basic

science, different species, interdependency in the ecosystems, pollution and its impacts and the way to solve the problems.

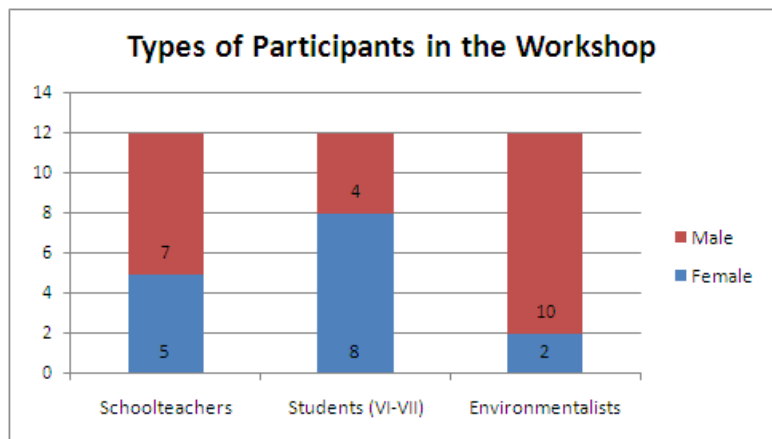


*Marvellous Mangroves Curriculum Implementation Team at CLEAN Office premises*

The curriculum is already proved its importance and adapted, replicated and is under implementation in Australia, Belize, Brazil, Canada, Cayman Islands, China, Guatemala, Honduras, Indonesia and Sri Lanka. Mr. Martin A. Keeley, currently the Global Education Director of Mangrove

Action Project (MAP) is the main author of MM Curriculum with teachers from different corners of the world. After the long journey the MM Curriculum had been introduced to Bangladesh in July 2013 when Martin Keeley visited Bangladesh and conducted a workshop under partnership with Coastal Livelihood and Environmental Action Network (CLEAN), a local organization focuses on biodiversity, climate change and agriculture for sustainable environment and livelihoods in coastal zone of Bangladesh. Mr. Martin Keeley also visited a school (Laudob Badamtala High School, Dacope, Khulna) to get knowledge on education system in Bangladesh.

Workshop on Marvellous Mangroves Curriculum in Bangladesh with the teachers, students and environmental activists started on 26th December 2014, Friday with participation of 12 students, 12 teachers and 12 environmental activists including the organizers from CLEAN. Among the participants, 14 were female and 22 male. The details of the participants are given in the graph.



Traditionally students leave their schools and get admission in colleges after 10 years of education. Considering this, students were selected only from Class-VI to Class-VII to participate in the workshop so that they can play role of leadership for at least three years to run students' Mangrove Clubs in the schools. At least one teacher from each school had science background among the participating teachers in the workshop to confirm their contribution in mangrove education in future.

CLEAN resource person Mr. Palash Das conducted the inauguration session of the workshop. He focused on the relationship of MAP and CLEAN briefly and introduced the guests, facilitators and participants of the workshop. The inauguration session of the workshop started with the opening speech of CLEAN chief executive Hasan Mehedi. He focused on the

curriculum development process and requested the participants to edit its content, language, stories, fact sheets and whatever they seem incorrect or difficult. Then MAP global education director Mr. Martin A. Keeley presented a PowerPoint on experience of CLEAN in the sector of forest and biodiversity. He also presented a video on Marvellous Mangroves Curriculum worldwide with subtitles in Bengali so that the participants can easily communicate with the mission and vision of the education guidebook. The video focused on



*A group of teachers and students are describing characteristics of leaves of a red mangrove tree*

emergence of child education on the mangroves ecosystem and MAP's activities to reach this purpose. The participants got a clear understanding on the workshop through inauguration session. Convener of Bonojibi Odhikar Suraksha Mancho, a civil society platform to protect forest people rights Mr. Sazzadur Rahim Pantha addressed the participants as honourable guest and he closed the inaugurating session with his speech.



*Participants of the workshop on Marvellous Mangroves Curriculum*

Rezaul Karim Zitu and CLEAN chief executive Hasan Mehedi conducted the sessions. In the first session Mr. Hasan Mehedi gave a description on four types of wetlands in Bangladesh - Haor (bowl or saucer shaped shallow depression, also known as a backswamp), Beel (billabong or a lake-like wetland with static water), Mangroves and Coral Islands. The teachers and students got a clear understanding of different types of ecosystems and water bodies from this session. Meanwhile, CLEAN staff member Utsargo Roy described the linkage and rationale between the MM Curriculum and National Curriculum of Bangladesh.

To deliver more clear information on the water bodies, Rezaul Karim Zitu



conducted a game on Water and again, Mehedi, gave a description on properties of water focusing on water cycle. Mr. Keeley further conducted two games on water cycle reality and

water cycle rap so that the participants can get idea on learning through enjoyment. The sessions enjoyed a lot by the participants.

Group of the Workshop	Name (Tree)	Name (Birds)
Group 1	Sundari ( <i>Heritiera fomes</i> )	Bon Morog
Group 2	Bain ( <i>Avicennia alba</i> )	Kadakocho
Group 3	Garan ( <i>Ceriops decandra</i> )	Tia
Group 4	Golpata ( <i>Nypa fruticans</i> )	Machranga
Group 5	Khalsi ( <i>Aegicera scorniculatum</i> )	Batan
Group 6	Keora ( <i>Sonneratia apetala</i> )	Gangchil

On afternoon, another session conducted on the role of mangrove species to the human being including water purifying, protection from cyclones, land stability, habitats for wildlife, economy and eco-tourism. After a long discussion on the Sundarbans contribution to Bangladesh, a session on 'Know the Mangroves' conducted by Martin and Zitu. In the session, the participants observed propagules, pneumatophores and leaves of mangrove trees collected by the students from nearby mangrove forest of their communities. They were served by an Identification Chart which gave them some interesting characteristics of the Sundarbans trees.



The exercise of food web in the workshop

In the creative hour of first day, a group of participants started drawing a canvas on Sundarbans mangrove forest. Another group started making net to catch zooplanktons and a group of students and teachers started rehearsal a drama on story of Mr. Frog's Dream from MM Curriculum book.

## 2ND DAY: 27 DECEMBER 2014, SATURDAY



Exercise: Students and teachers are checking how feathers work in the water

After a clear knowledge on water cycle and crucial role of water on mangrove ecosystem, the students and teachers participated in a session on ecosystem and interdependency of different species of mangrove forest. After giving details description on food chain and food web, Mr. Keeley invited all of the participants to join in a game on food web to give a clear understanding on how the human being are affected by destroying microorganisms and other species. The participants played the role of producers like phytoplankton, trees and grasses, and consumers like small and big animals. The participants also draw a food web on their worksheet after the role play. Through this game, the participants got information on interconnection between all species in a mangrove ecosystem.

The mangrove wetlands play a vital role as a resting place of birds. As a result more than 230 species of birds can be found in the Sundarbans mangrove forest. After giving a brief on Birds of the Sundarbans by Hasan Mehedi, Mr. Keeley described why wetlands are important for the birds and what roles are played by birds on the ecosystem. The participants asked a bunch of questions to know more about different types of birds especially the migratory ones. Mr. Keeley responded the questions and invited them to participate in a test on bird feathers. The participants tested how birds clean their feathers and keep them warm in winter.



*A girl student is mixing salt water in the container to see what happen when salt water and freshwater meet together.*

Earlier the session, the participants came to know that, birds produce some oil from their glands to clean-up water from their feathers. In this session, they got idea about the activists' responsibility when the birds fall into unnatural liquid like during oil spills. Participants expressed their hearty interest to know the lessons from this session. They also participated in a role play on Migration Maze and got clear understanding on the impacts of unwise human interventions on the migratory birds.

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On the afternoon, teachers and students participated in a new exercise to identify birds by



seeing their silhouettes and 'Fill the Bill' activity where they identify a bird species by seeing model foods in the mangrove ecosystem. They also identify the types of bills they use for which types of food taking.

In the evening the participants started preparation for field trip and enjoyed Bonobibi's Story, a legendary story about the beliefs and culture of the forest dependent communities. Later they watched

the drama of 'Mr. Frog's Dream' prepared by the students and mentored by Utsargo Roy. After playing the drama the actors and actresses sang a song about mangroves, which is written by them. Some of the participants also continued their drawing mural on the large canvas.

At 10:00 PM of the day, all participants and organizers took their room on the boat for 3-day-long field trip during the workshop.

### **3RD DAY: 28 DECEMBER 2015, SUNDAY**

After a brief recapitulation through Water Cycle Rap exercise and discussion on types of wetlands in Bangladesh, the workshop of third day started with a discussion on recent oil

spillage in the Sundarbans. An oil tanker sank in the Shela River of the Sundarbans on 9th December early morning and more than 350 tonnes of furnace oil slicked in the Sundarbans. Mr. Hasan Mehedi facilitated the session with focus on importance of an activist group for immediate action against all pollution. He emphasises on protecting the Sundarbans for very existence of the communities living in coastal zone of Bangladesh.



*A teacher is drawing on the large canvas to make a common painting of all participants*

In Harbaria Tourist spot, the participants identified mangrove species by using magnifying lenses and seeing propagules, pneumatophores and leaves of black, white and red mangroves. They got a clear understanding on Niche by touring around the forest area. The participants also watch and drew birds by using binoculars provided by the organizers. After a short tour in the forest, Martin facilitated a 'Sound Mapping' exercise in Harbaria Tourist Spot. The team identified a number of invasive and alien species in the tourist spot planted by the Forest Department of Bangladesh.

The participants noticed a lot of pollution in the tourist spot and asked about potential impacts of those polluting wastes. So, Mr. Martin focused on pollution in next session and gave them an idea on different types of pollution. The teachers and students participated in the open discussion and described about pollutions in Bangladesh like oil pollution, human wastes, factory effluents, run off etc. The discussion followed by an exercise named "Pollution Soup" which described how little drops of pollution accumulate in the mangrove wetlands and finally create a disaster in the basin area. They also oriented on cleaning process of the polluting materials.

In afternoon the participants started bird watching again and identified names of the birds. Then they started drawing their joint mural on large canvas. Some of them painted small pictures on paper. A group of participants joined to see documentary film on Sundarbans and mangrove ecosystems.

#### **4TH DAY: 29 DECEMBER 2014, MONDAY**

The team reached Katka wildlife sanctuary on 4th day morning. They watched birds from the boat and deer grazing on the riverbank of the Sundarbans. The participants get off from the boat to enter in the sanctuary to visit Jamtala Beach area. On the way and in the beach, they collected wastages left by the tourists and enlisted those for research and presenting to the media. On the middle of the way, Martin facilitated the Sound Mapping exercise once again. The students and teachers also identified birds and tree species and took note on their characteristics. They found several other species also like different species of crabs, fishes and small creatures.

The groups of teachers and students collected seawater and Rezaul Karim Zitu tested different aspects of water like Dissolved Oxygen (DO), Salinity, pH, Electric Conductivity (EC), Water Temperature and Total Dissolved Solid (TDS). Martin and Zitu discussed on water





*Martin is describing characteristics and role of a Sun Grass of mangrove ecosystem*

parameters and gave them idea on desired standard of water and what are the impacts of different parameters on different species. After getting clear idea on water quality through question and answer, the participants collected zooplankton and phytoplankton from seawater with their nets. Some of them got small crabs, snails and oysters also. They also collected those and carried to the boat for further testing by microscopes.

After getting back to boat, the participants tested sample water using different kits provided by Khulna University and MAP. They also checked water from pond situated in the sanctuary and found it was sweet wild animals used to drink it. The participants noted down different parameters of the water samples and identified which quality is fit for which creatures.

On afternoon, the participants set slides using microscopes in different groups and tried to find-out names and characteristics of the planktons they collected as sample from seawater. Martin A. Keeley and Rezaul Karim Zitu assisted them to conduct this activity. The participants were excited after identifying some species and drew their pictures on their copy book.

After identifying planktons the teachers and students visited another part of Katka wildlife sanctuary and identified some more trees and small organisms there. They noticed a salt-making house, ancient utensils and marks of houses which is under water now. The facilitators discussed about ancient history of inhabitants in the Sundarbans.

After coming back from other bank of Katka wildlife sanctuary, the participants again started setting their individual slides to see planktons using microscopes. Completing those, they joined in creative hours and joined drawing mural on big canvas.

## **5TH DAY: 30 DECEMBER 2014, TUESDAY**

The boat started towards another part of the reserve forest and reached Tambulbunia in the early morning. This place was selected as it is not a tourist area. So, the workshop participants got a solitary place to practice some exercises without any interruption. The participants entered in the forest early in the morning and re-examined mangrove propagules, pneumatophores and leaves. They also watched some crabs, mudskippers, birds, Gangetic dolphin, fishes, snails, ospreys etc. Martin Keeley again facilitated a Sound



*Students are collecting planktons from Jamtala Beach area using nets made by them*



*Students and teachers are using microscopes to identify planktons under assistance of Martin A. Keeley*

Map exercise here so that the participants could hear more wild sounds and identify them. The teachers and students also participated in another exercise named 'Explore the Footprints' and identified a number of small creatures beneath a footprint of the participants. Through the exercise, the students got idea about adversity of human impacts on the mangroves.

### Visit to Joymonir Ghol Village

After taking a short tea break all participants joined in a visit to Joymonir Ghol village, the nearest settlement from the place oil spillage in the Shela river of the Sundarbans. Teachers and students talked to the local people about the oil spillage, how they spent their time on that moment, how government played the roles and responsibilities and what roles the local inhabitants played to clean-up slicked oil from the river.



*The participants are discussing with fisher community members about their lives and livelihoods*

After the discussion with local people Martin and the participants met some Mawali (Honey collector), Bawali (Nypa Palm collector), and fisher folks family. They asked about their livelihood, natural and man-made disastrous events and problems in the forest management. Through this session the participants got a clear understanding on forest dependent people and lacks in forest management.

### Next Planning

After visiting Tambulbunia forest spot, the participants came back to boat and a session on the future planning started. The participants divided in 6 groups provided flip chart and marker to write down their plan on the paper to present before all participants. The shared different ideas including:

- a) Formation of a club with active participation of schoolteachers, students and environmental activists to carry over the activities given in MM Curriculum. They proposed some names of the proposed club like: (i) Mangrove Club (ii) Marvellous Mangroves Club (iii) Mangrove Science Club (iv) Nature Club and (vi) MAP Science Club.



*A girl student is trying to identify a small creature by her magnifying lens under a giant footprint*

b) Conducting regular workshop with the teachers and students so that they can develop themselves according to the latest information and scientific innovation on mangroves;

c) Providing scientific and education materials to the schools so that the teachers and students can conduct mangrove education and their own primary research;

d) Organizing different

sessions in schools on mangroves and basic science;

e) Conducting time to time visit to the Sundarbans for exploring mangrove species, primary research and cleaning up mangrove forest;

f) Organizing awareness building programs in the schools and community for sensitizing students, communities and policymakers;

g) Organizing press conferences to share student's findings, ideas and to create pressure on different stakeholders; and

h) Organizing annual gathering of mangrove clubs to share their ideas, innovations and model of works.



*A student participant, Nibedita, is discussing on next actions of proposed Mangrove Club*

MAP and CLEAN representatives discussed

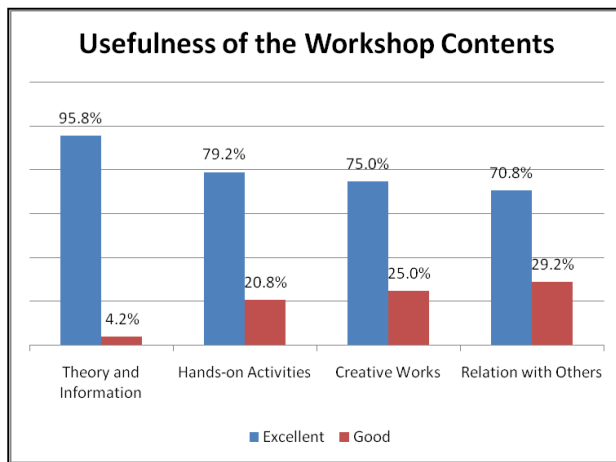
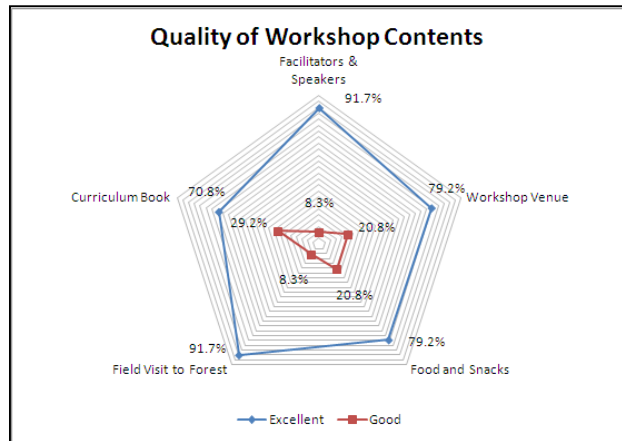
on each and every point of their presentations and assured them to try for doing all according to their suggestions.

## Evaluation

An evaluation session was organized after completion of planning session. The participants are provided by an Evaluation sheet to assess the conducted sessions, given information, curriculum book, creative works, venue and the facilitators, food and visit to the Sundarbans. They evaluated the workshop from two aspects - the quality and usefulness of contents of the workshop. The result of the evaluation is given bellow:

Among the participants, 91.7% ranked the Facilitators and Speakers as excellent while 8.3% ranked good in quality. In an average, the Facilitators got 3.92 point out of 4. 79.2% participants marked the workshop venue as excellent while 20.8% marked as good.

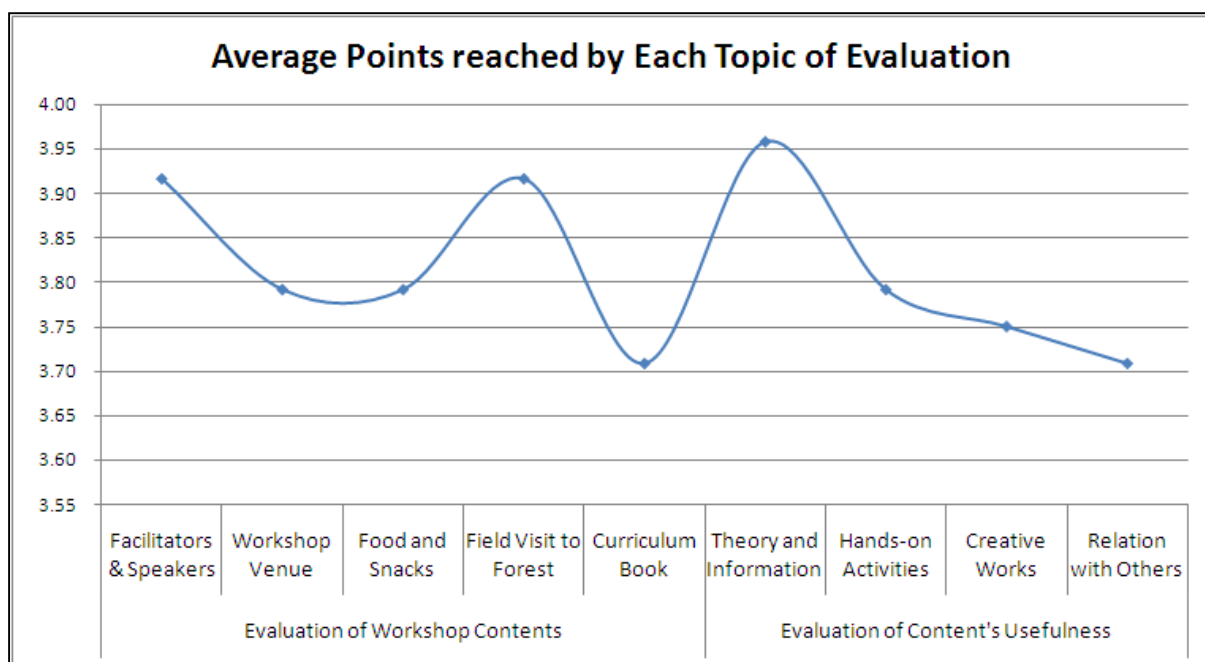
In an average, workshop venue got 3.79 points out of 4. Food and Snacks were excellent according to 79.2% participants while those were good according to 20.8% participants. In an average, Food and Snacks got 3.79 out of 4. The Field Visit to the forest also got 3.92 out of 4 points and 91.7% participants said that the visit was excellent while 8.3% said it was good. The MM Curriculum Book is excellent according to 70.8% participants while 29.2% said that it is good but not excellent. In an average, the book got 3.71 points out of 4.



According to evaluation of the participants, theory and information part was the strongest part of the workshop. 95.8% participants marked it as excellent while only 4.2% marked as good. It got 3.96 out of 4. The hands-on activities got 3.79 and 79.2% participants marked it as excellent while 20.8% marked as good. Creative Works were excellent according to mark of 75% participants while 25% said those were good with point of 3.75. 70.8% participants got excellent level of



happiness for new relationships with other teachers and students while 29.2% are good with those. It got 3.71 out of 4.



## CLOSING PROGRAM



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The closing program started after tea break in the morning on the rooftop. Representatives from the students, teachers, activists and guests addressed the closing program. They pledged to deliver the lessons learnt to their colleagues and friends in their schools and communities. A student, Swarna, facilitated a pledge to protect Sundarbans and mangrove species from all types of destruction. All the participants followed her and committed to do so. The teachers committed that they would start Mangrove Clubs in their schools as soon as possible. Among the organizers Utsargo Roy and facilitator Rezaul Karim Zitu addressed the closing program and assured the participants about supports from CLEAN. In his speech, SPS executive director Alamgir Islam Lablu paid his special thanks to the organizers and MAP, and expressed his best wishes to all of the participants. He also committed to expand his supports to the mangrove clubs from where the students will get real knowledge on nature and interaction between wildlife and human being.

In closing speech, CLEAN's chief executive Mr. Hasan Mehedi expressed his hearty thanks to the teachers, students, working team members and service staffs. He especially thanked Martin A. Keeley and his assistants for outstanding facilitation of the workshop and requested him to convey hearty thanks to MAP on behalf of CLEAN and all staff members. He requested the teacher to give lesson to their student such enthusiastic system. He encouraged students to learn their lesson by thinking not memorizing. He also requested the participants to establish the nature club as early as possible in their school arena.



*Mr. Alamgir Islam Lablu, Executive Director, Samaj Progoti Sangha (SPS) is addressing the closing program of the workshop.*

In his closing speech, Mr. Martin A. Keeley greeted all of the participants and described the students' crucial role in conservation and restoration of mangrove forest. He said that today's students would be the leaders and decision-makers in future. He hoped that these students will learn science not to pass in the examination but to love the nature and its components which are very important for human civilization. He requested to the students to understand science, think about the inter-relationship between all elements of nature and then learn about the topic. He again gave a brief on MM Curriculum and hoped that the book would be enough to support students and their teachers to know basic science and mangrove forest with enjoyment. He also paid his hearty thanks to CLEAN team for their outstanding hard work to make the workshop successful.

After Martin's speech, the 5-day-long workshop closed formally to see off all of the participants to their home.

## Workshop with Teachers and Students

26-30 December 2014 | Friday - Tuesday

### WORKSHOP SCHEDULE

Day 1: 26 December 2014, Friday

Time	Topic	Venue	Facilitator
09:00-11:00	<b>Inauguration</b> <ul style="list-style-type: none"> <li>▪ Introduction: Palash</li> <li>▪ Project Vision and Mission: Martin</li> <li>▪ Objectives of the Workshop: Mehedi</li> <li>▪ Guest Speech: Guests</li> </ul> <b>Guests</b> <ul style="list-style-type: none"> <li>▪ Conservator of Forest (CF), Sundarbans Region</li> <li>▪ Divisional Forest Officer (DFO), Sundarbans West</li> <li>▪ District Education Officer, Khulna or ADC-Education</li> <li>▪ Dr. Dilip Kumar Datta (KU), Sazzadur Rahim Pantha (CSS) and Gouranga Nandy (BBC)</li> <li>▪ Martin A. Keeley</li> </ul>	Regional Cooperative Training Institute, Boyra, Khulna	Hasan Mehedi
11:00-11:15	Tea Break		Palash Das
11:15-13:00	Self introduction Selection of student as teacher's partner (Mehedi) Distributing MM Curriculum books to the teachers and introduction to the curriculum & how it works (Utsargo Roy) <b>Coastal Ecosystems: (Hasan Mehedi)</b> <ul style="list-style-type: none"> <li>– Brief overview of 4 different systems</li> <li>– Q&amp;A on Systems</li> </ul> <b>Focus on Water:</b> <ul style="list-style-type: none"> <li>– Mystery Object (Zitu)</li> <li>– Properties of Water (Zitu)</li> </ul>	Regional Cooperative Training Institute	Martin A. Keeley Rezaul Karim Zitu
13:00-14:00	Lunch Break	Dining Room	Palash Das
14:00-15:30	<b>Focus on Water:</b> <ul style="list-style-type: none"> <li>– Saltwater/freshwater/estuaries demonstration – why important to Bangladesh (Zitu and Mehedi)</li> <li>– Water Cycle Relay (Martin and Zitu)</li> <li>– Water Cycle Rap (Martin and Zitu)</li> </ul>	Regional Cooperative Training Institute	Martin A. Keeley Rezaul Karim Zitu
15:30-15:45	Tea Break		Palash Das
15:45-17:00	<b>Types of Wetlands found in Bangladesh [Mehedi]</b> <ul style="list-style-type: none"> <li>– Review types and functions of mangroves: why important (cyclone protection, land stability, fishing, tourism, wildlife, water quality)</li> </ul> <b>Know the Mangroves [Identification using chart &amp; magnify glass]</b> <ul style="list-style-type: none"> <li>– Mangrove propagules, pneumatophores and leaves (teachers draw or paste into books)</li> </ul>	Regional Cooperative Training Institute	Martin A. Keeley Rezaul Karim Zitu
17:00-18:00	<b>Creative Hour: Art and Story Time</b>	Training Room	Martin A. Keeley

Time	Topic	Venue	Facilitator
	<ul style="list-style-type: none"> <li>– Continuing work on writing own story/song/rap about mangroves or creating a mangrove mural (small groups)</li> <li>– Mr. Frog Rehearsal</li> </ul>		Rezaul Karim Zitu
18:00	Closing of the day		Hasan Mehedi
20:00	Dinner	Dining Room	Palash Das

### Day 2: 27 December 2014, Saturday

TIME	TOPIC	Place (where you are now)	FACILITATOR
9:00-11:00	<b>Food Webs and Chains</b> <ul style="list-style-type: none"> <li>– Living web: basics and string game (Martin)</li> <li>– Design and food chain/web for mangroves (emphasise on detritus and invertibrates)</li> </ul>	Regional Cooperative Training Institute	Martin A. Keeley Rezaul Karim Zitu
11:00-11:15	Tea Break		Palash Das
11:15-13:00	<b>Birds that use wetlands in Bangladesh</b> <ul style="list-style-type: none"> <li>– Looking at feathers (lift off) [Martin]</li> <li>– Migration: What is it, how does it work?</li> <li>– Migration headache</li> </ul>	Regional Cooperative Training Institute	Martin A. Keeley Rezaul Karim Zitu
13:00-14:00	Lunch Break	Dining Room	Palash Das
14:00-15:30	<b>Looking at Birds</b> <ul style="list-style-type: none"> <li>– Migration Maze</li> <li>– Identify bird silhouettes: how different species function</li> <li>– How wings work (including effects of oil and water)</li> <li>– Fill the Bill (how birds eat!)</li> </ul>	Regional Cooperative Training Institute	
15:30-15:45	Tea Break		Palash Das
15:45-17:30	<b>Preparing for field trip:</b> <ul style="list-style-type: none"> <li>– Making fishing nets</li> <li>– Paper and crayon for sound map (each take their own)</li> <li>– Sound map activity</li> </ul> <b>Creative Hour: Art and Story-time</b> <ul style="list-style-type: none"> <li>– Mr. Frog's Dream (about migration)</li> <li>– Bonobibi story</li> </ul>	Regional Cooperative Training Institute	Martin A. Keeley Rezaul Karim Zitu
17:30-18:30	<b>Creative Hour: Art and Story Time</b> <ul style="list-style-type: none"> <li>– Continuing work on writing own story/song/rap about mangroves or creating a mangrove mural (small groups)</li> </ul>	Regional Cooperative Training Institute	Martin A. Keeley Rezaul Karim Zitu
20:00-21:00	Dinner	Dining Room	Palash Das
21:00-22:00	<b>Taking room in the boat</b> [the boat will start journey by 12:00 AM towards the Sundarbans and reach Hiron Point, the World Heritage Site at 11:30 next day]	From Training Centre to Boat	Palash Das Rezaul Zitu Utsargo Roy
00:00	Boat start towards Hiron Point		



### Day 3: 28 December 2014, Sunday

TIME	TOPIC	Place (where you are now)	FACILITATOR
08:00-09:00	Breakfast	Rooftop	Palash Das
09:00-11:00	<b>Types of Wetlands found in Bangladesh</b> <ul style="list-style-type: none"> <li>– Observing the oil spill [power point - Mehedi]</li> <li>– Issues: cutting, burning, shrimp farms, dredging, filling, pollution, construction, erosion</li> <li>– Cyclone Barrier</li> </ul>	Rooftop On the way to Hiron Point	Martin A. Keeley Rezaul Karim Zitu
11:00-11:30	Tea Break	Rooftop	Palash Das
11:30-13:00	<b>Know the Mangroves [microscope, magnify glass for detailing] [Martin &amp; Mehedi]</b> <ul style="list-style-type: none"> <li>– Mangrove propagules, pneumatophores and leaves (teachers draw or paste into books)</li> <li>– Creatures: Crab, Mudskipper, Birds, Dolphin, Fish, Snail, Osprey etc.</li> <li>– Mangrove colouring sheet (what lives where): concept of a niche</li> </ul>	Hiron Point	Martin A. Keeley Rezaul Karim Zitu
13:00-14:00	Lunch	Rooftop	Palash Das
14:00-15:00	<b>Creative Hour: Art and Story Time</b> <ul style="list-style-type: none"> <li>– Continuing work on writing own story/song/rap about mangroves or creating a mangrove mural (small groups)</li> </ul>	Rooftop/Hiron Point	Martin A. Keeley Rezaul Karim Zitu
15:00-15:15	Tea Break (in the session on rooftop)	Rooftop	Palash Das
15:15-17:00	<b>Pollution and Human Impacts</b> <ul style="list-style-type: none"> <li>– Review types of water pollution (oil, human and animal wastes, run-off etc.)</li> <li>– Detritus Tag</li> <li>– Pollution Soup</li> </ul>	Rooftop/Hiron Point	Martin A. Keeley Rezaul Karim Zitu
17:00	On the way to Katka wildlife sanctuary		
17:00-18:30	<b>Pollution and Human Impacts (continued...)</b> <ul style="list-style-type: none"> <li>– Oil Spill clean-up experiment: mangroves and sea-grass</li> <li>– Oil and Water on feather</li> <li>– Climate Change</li> </ul>	Rooftop	Martin A. Keeley Rezaul Karim Zitu
18:30-20:00	Movie show on the Sundarbans	Rooftop	Utsargo Roy
20:00-21:00	Dinner	Rooftop	Palash Das

### Day 4: 29 December 2014, Monday

TIME	TOPIC	Place (where you are now)	FACILITATOR
08:00-11:00	<b>Sanctuary and Beach Visiting</b> <ul style="list-style-type: none"> <li>– Introduction (Ocean conservancy &amp; Data analyzing)</li> <li>– Beach clean up and data collection (sources of the waste)</li> </ul>	Katka Sea Beach	Martin A. Keeley Rezaul Karim Zitu

TIME	TOPIC	Place (where you are now)	FACILITATOR
	<ul style="list-style-type: none"> <li>– Observing the animals and birds using binocular and Telescope</li> <li>– Review all the data</li> </ul>		
11:00-11:15	Tea Break	Rooftop	Palash Das
11:15-13:00	<b>Water Sample Testing</b> <ul style="list-style-type: none"> <li>– Observe water samples in microscopes, identify invertebrates, plankton etc. from current location</li> <li>– Draw images of invertebrates and planktons found</li> <li>– Water quality testing</li> <li>– Conduct a transect</li> <li>– Discuss results</li> </ul>	Katka Wildlife Sanctuary	Martin A. Keeley Rezaul Karim Zitu
13:00-14:00	Lunch	Rooftop	Palash Das
14:00-15:00	<b>Water Sample Testing (continued...)</b> <ul style="list-style-type: none"> <li>– Observe water samples in microscopes, identify invertebrates, plankton etc. from current location</li> <li>– Draw images of invertebrates and planktons found</li> <li>– Water quality testing</li> <li>– Discuss results</li> </ul>	Katka Wildlife Sanctuary	Martin A. Keeley Rezaul Karim Zitu
15:00-15:15	Tea Break	Rooftop	Palash Das
15:15-16:30	<b>Creative Hour: Art and Story Time</b> <ul style="list-style-type: none"> <li>– Continuing work on writing own story/song/rap about mangroves or creating a mangrove mural (small groups)</li> <li>– Prepare presentation of Data Collection</li> </ul>	Katka Watch Tower Area	Martin A. Keeley Rezaul Karim Zitu
16:30-18:00	<b>Review the Workshop and Evaluation</b> <ul style="list-style-type: none"> <li>– Suggestion for changes and additions</li> <li>– Possible future activities at classroom and school</li> </ul>	Rooftop	Martin A. Keeley Hasan Mehedi
18:00	Boat will start towards Harbaria Tourist Spot		
18:30-20:00	Documentary Film on the Sundarbans	Rooftop	Utsargo Roy
20:00-21:00	Dinner	Rooftop	Palash Das

### Day 5: 30 December 2014

TIME	TOPIC	Place (where you are now)	FACILITATOR
08:00-09:00	<b>Know the Mangroves (continued...)</b> <ul style="list-style-type: none"> <li>– Re-examine Mangrove propagules, pneumatophores and leaves (teachers draw or paste into books)</li> <li>– Creatures: Crab, Mudskipper, Birds, Dolphin, Fish, Snail, Osprey etc.</li> <li>– Water testing and transect</li> </ul>	Harbaria Tourist Spot	Martin A. Keeley Rezaul Karim Zitu
09:00	Boat starts to JoymonirGhol village		
09:00-09:30	Breakfast	Rooftop	Palash Das
09:30-11:00	<b>Closing Program</b> <ul style="list-style-type: none"> <li>– Presentation of stories and posters and Data</li> </ul>	Rooftop	Martin A. Keeley

TIME	TOPIC	Place (where you are now)	FACILITATOR
	– Administrative Issues		Hasan Mehedi Kushal Roy
11:00-13:00	Tea Break	Rooftop	Palash Das
11:30-13:00	Visiting Joymonir Ghol village (meet fishermen, Bawali [Nyphapulm] and Mouali [honey collector] family)	JoymonirGhol Village	Martin A. Keeley Hasan Mehedi
13:00	Boat will start towards Mongla		
13:00-14:00	Lunch Break	Rooftop	Palash Das
14:00	Boat will start towards Khulna		
14:00-15:30	<b>Closing Program (continued...)</b> – Wrap up and presentation of certificate and posters – Presentation of stories – Administrative Issues – See off the participants of 2 schools: Laudob-Badamtala High School and Mongla High School		Martin A. Keeley Kushal Roy Hasan Mehedi ShubornaDisa
15:30-16:00	Tea Break		
16:00-17:00	<b>Closing Program (continued...)</b> – Wrap up and presentation of certificate and posters – Administrative Issues		Hasan Mehedi Martin A. Keeley Teachers Students
17:00	See off all participants		

## Workshop on Marvellous Mangroves in Bangladesh

26-30 December 2014 | Khulna, Bangladesh

Organized by  
Coastal Livelihood and Environmental Action Network (CLEAN)

### LIST OF WORKSHOP PARTICIPANTS

SL #	NAME	POSITION	INSTITUTION
1.	Chinmoy Kumar Biswas	Headmaster	Abul Hossain Girls High School
2.	Mrinal Kanti Roy	Assistant Teacher	Abul Hossain Girls High School
3.	Joyeeta Biswas	Student, Class-VI	Abul Hossain Girls High School
4.	Triptee Bain	Student, Class-VIII	Abul Hossain Girls High School
5.	Rajib Kumar Bachhar	Assistant Headmaster	Channir Chak Collegiate School
6.	Biplob Kanti Mondal	Assistant Teacher	Channir Chak Collegiate School
7.	Dina Moni Sarkar	Student, Class-VI	Channir Chak Collegiate School
8.	Naimur Rahman	Student, Class-VIII	Channir Chak Collegiate School
9.	Shapna Rani Biswas	Assistant Teacher	Comrade Ratan Sen Collegiate Girls School
10.	Rumisa Khatun	Assistant Teacher	Comrade Ratan Sen Collegiate Girls School
11.	Tabassum Jannat Swarna	Student, Class-VI	Comrade Ratan Sen Collegiate Girls School
12.	Naima Jerin Meem	Student, Class-VI	Comrade Ratan Sen Collegiate Girls School
13.	Goutam Kumar Sardar	Assistant Teacher	Laudob Badamtala High School
14.	Kangkana Roy	Assistant Teacher	Laudob Badamtala High School
15.	Anik Sarkar	Student, Class-VI	Laudob Badamtala High School
16.	Nibadita Biswas	Student, Class-VIII	Laudob Badamtala High School
17.	Gabinda Kumar Biswas	Assistant Teacher	Surkhali High School
18.	Niranjana Kumar Adhikari	Assistant Teacher	Surkhali High School
19.	Sabbir Sheikh	Student, Class	Surkhali High School
20.	Bristy Bhadra	Student, Class	Surkhali High School
21.	Rohini Baran Roy	Assistant Teacher	TA Faruq School and College
22.	Rafiqul Islam	Assistant Teacher	TA Faruq School and College
23.	Jesmin Akter	Student, Class-VIII	TA Faruq School and College
24.	Zakaria Mahmud	Student, Class-VIII	TA Faruq School and College
25.	Martin A. Keeley	Education Director	Mangrove Action Project (MAP)
26.	Alamgir Islam Lablu	Executive Director	Samaj Progoti Sangstha (SPS)
27.	Hasan Mehedi	Chief Executive	CLEAN
28.	Palash Das	Resource Person	CLEAN
29.	Rezaul Karim Zitu	Education Coordinator	CLEAN
30.	Akbar Hossain Wridha	Resource Mobiliser	CLEAN
31.	Farjana Akter	Translating Author	CLEAN
32.	Shuborna Islam Disa	Fin & Admin Officer	CLEAN
33.	Utsargo Roy	Contributor to Book	CLEAN
34.	Nazmul Huda Palash	Contributor to Book	CLEAN
35.	Utsob Roy	Contributor to Book	CLEAN
36.	Sajib Chanda	Photographer	PRAN, Noakhali