

PROCESS DOCUMENTATION

Programme to Conserve the Urban Biodiversity of West Bengal With School Students

Supported by



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With inputs from Diti Mookherjee and Indrajit Mullick

AIM OF THE DOCUMENTATION

The main aims of the documentation are:

- To document the process that was followed in the implementation of the *Programme to Conserve the Urban Biodiversity of West Bengal with School Students*.
- To understand the various steps in fulfilling the objectives of the programme
- To identify the areas that may require special attention, so that they can be in mind when the programme is implemented again in the future.
- To understand the scope of the programme and how it affects the target audience
- To prepare the grounds for the development of a module for environmental education so that the programme can be implemented repeatedly and by different people.

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THE PROGRAMME

Background

The *Programme to Conserve the Urban Biodiversity of West Bengal with School Students* had its beginnings in Diti Mookherjee's active involvement in nature study programmes conducted by ASED² and other organizations. The success of these programmes convinced her that this knowledge could well be extended to reach out to children with limited exposure and opportunities to explore nature.

The *Programme to Conserve the Urban Biodiversity of Kolkata with School Students* was launched in October 2004 when Diti Mookherjee received the first grant from the Rufford Small Grants for Conservation UK. She initiated the first phase of the programme with the support of the ASED team. Subsequently the grant was renewed for the *Programme to Conserve the Urban Biodiversity of West Bengal with School Students, 2007-08* and a booster grant was awarded in December 2008. Each stage of renewal will henceforth be referred to as a phase. The programme is currently in its third phase.

A brief description

The programme essentially involves a series of interactions with a select group of students in each of the chosen schools and through these interactions exposing the children to the fascinating biodiversity that surrounds them. Through slide shows, field trips guided by environmentalists, nature games and lively discussions the children are encouraged to appreciate the wonder of nature and subsequently develop their own field action projects.

The projects give the students a first hand experience at conservation and motivate them to believe that even the smallest effort can make a significant difference. It is envisaged that when ASED moves out, the schools will continue to implement the original projects involving subsequent batches of students in them.

The programme involves students in middle school aged between 12 to 14 years and covers both government and private schools. On an average, individual students get the opportunity to be a part of the programme for one year.

AIMS

The overall aim of the project is to make school students aware of their natural urban heritage and promote efforts to conserve it.

² ASED, the Association for Social and Environmental Development is a non-profit making organization with the work objective of biodiversity enhancement through public awareness, action research and people's participation.

The specific aims are:

- To use an action-based approach to create a basic understanding of biodiversity and the inter-dependence of various species.
- To promote urban biodiversity conservation in West Bengal with school students
- To encourage students to contribute to biodiversity conservation actively.
- To give students with an inherent interest in the environment and its conservation a platform to explore their world and contribute positively to its preservation.

DEVELOPMENT OF THE PROJECT SINCE 2004

In the first phase 14 schools from Kolkata were recruited to the programme. The schools were well distributed over the city and were chiefly government or government sponsored in nature. At this time the programme was called *Programme to Conserve the Urban Biodiversity of Kolkata*, as its scope was limited too the city itself.

In the second phase the involvement and performance of the 14 schools was reviewed and a decision was made to continue with only those schools which had shown genuine interest and where the school authorities were supportive of the efforts of the students. Consequently the 14 schools were pared down to 5. It was also felt that the programme could reach out to students outside Kolkata and accordingly 2 schools from Durgapur were recruited for the second phase. At this time the project was renamed *Programme to Conserve the Urban Biodiversity of West Bengal* as it had now extended its reach beyond the limits of the city.

In the third phase, one of the 5 Kolkata schools was reluctant to continue and so was replaced with a school from Howrah. At present there are 4 schools in Kolkata, 1 in Howrah and 2 in Durgapur involved in the project.

PHASE 1: 1 year



Chart 1: Flow chart showing the phases of the programme

IMPLEMENTING TEAM:

The team which implemented the programme consisted of:

- **The Team Leader:** Visualizes and oversees the whole programme. Makes the initial contact with the schools. Acts as the primary contact for the school authorities. Orients the Core Group on the school projects. Develops resources that the schools can use during the programme.
- **Coordinator:** Maintains a regular dialogue with the school and the student participants. Organises the various events connected with the programme (slide illustrated talk, field trips, project sharing workshop, etc.). Visits the schools regularly and monitors the progress of the school projects. Acts as the liaison between the school and the Project Team. Makes available such resources as the school may request or need (e.g. Seeds, reference material, expert advice, etc.)
- **Panel of Experts:** A group of 3-4 persons who are authorities on various aspects of biodiversity. They are a vital part of the field trips and the talks the students are exposed to. The panel is also consulted whenever any school project needs their professional expertise.
- **Schools:** A group of interested teachers coordinates and guides the activities of the students on behalf of the school. They liaison with the programme coordinator to develop their school projects and elicit the support of the organisation and its panel of experts whenever they need it.

The ASED project was headed by Diti Mookherjee. It was coordinated initially by Samya Basu and later by Pratik Ghosh and then Indrajit Mullick with the able support of Kushal Mookherjee , Member National Board for Wildlife and State Wildlife Advisory Board West Bengal. The expert panel constituted Kushal Mookherjee, Susmita Basu and NN Chatterjee, all environmentalists.

STEP-BY STEP IMPLEMENTATION OF THE PROGRAMME

Step 1: Selection of Schools

Aim: To create a select group of schools that will participate in the programme

The schools are selected on the basis of the following criteria:

- **Location:** The presence of school grounds or proximity to open spaces helps when field trips are being organized. School authorities are also more likely grant permission for the trips if transport costs and time available for the trips are kept at a minimum.
- **Distribution:** Schools are chosen from different parts of Kolkata and later Durgapur so that various locales can be represented and the program can address a variety of issues. Having different localities represented in the programme allows the various facets of the vast biodiversity to be brought to light. It also makes for an interesting project sharing session at the

end of the year when students get to learn about the biodiversity in other parts of their city and state.

- **Level of Interest:** The support and involvement of the school authorities and teachers is vital to the success of the programme. Thus schools where the principal is encouraging and supportive of the students' efforts and those where the programme is viewed as an opportunity for the students to broaden their horizons are given priority. An assessment of the school's previous involvement with environment programmes can help gauge how successfully their students can be involved. Schools which are looking to build on earlier experiences as well as schools which do not have much access to programmes of this nature usually prove to be eager participants. Schools which are already deeply involved in environment activities may be avoided in order to avoid duplication of effort.
- **Classification of School:** Schools run or sponsored by the Government are given greater importance as the students of these schools have fewer opportunities for such exposure as compared to private schools. A few private schools who were greatly interested in the programme can be included.

Step 2: Approaching the Schools

Aim:

- ***Appraising the school authorities of the details of the programme and creating an interest in adopting it***
- ***Assessing the level of interest of the school***

Once a number of schools have been shortlisted, the Team Leader and Coordinator approach the school authorities. The head of the institution is appraised of the details of the programme and relevant documents describing the project and the implementing agencies are handed over for consideration.

This first contact is vital in determining the interest level of the school. It is also important to clarify at this stage the varying roles that each of the partners will play in conducting the programme. For example that the project will be an initiative of the school and that the organisation (ASED) will play a supporting role.

Step 3: The Agreement

Aim: *Setting the parameters for future interactions*

Once the school has satisfied itself that this is a programme they want to be involved in they sign an agreement with ASED. The agreement sets out in detail the various components of the programme and the responsibilities of the various partners. Copy of agreement annexed.

By this stage the school will have had time to mull over the details of the programme and will have an idea of how they want to carry it forward. It is thus important that any questions that the school or organisation has at this time be addressed clearly in order to avoid future misunderstandings.

Step 4: Slide Illustrated Talk

Aims:

- ***To help a large group of students understand the concept of biodiversity and interdependence of species***
- ***To give the students an exposure to the vast biodiversity of West Bengal***
- ***To address questions that students may have on the topic***
- ***To allow interested students decide whether they would like to participate actively in the project.***



A popular aspect of the programme the slide illustrated talk provides the students with their first glimpse into the fascinating biodiversity of the state. The slides breathe life into concepts that many students encounter only in their text books and make a long lasting impact on the children. The combination of slides and discussion helps give the children a fuller idea of the importance of biodiversity.

Kushal Mookherjee, wildlife expert, conducts the slide illustrated talk on behalf of ASED and highlights the biodiversity of West Bengal Scheduled in the school itself, the talk is attended by middle school students selected by the school. It usually lasts for an hour. Some schools choose only students from Class 7 while others might involve both Classes 7 and 8.

The talk is followed by an intense question-answer session and lively discussions, inevitable with a classroom full of curious youngsters!

The date(s) for the slide illustrated talk is decided beforehand by the teachers and the coordinator. Arrangements are made for slide projector and screen (could be provided by either the school or the organisation), a room that can be darkened and a sound system and microphone in case a large number of students attend. The choice of student groups is left to the school. It is mandatory that the teachers who are going to work on the subsequent stages of the programme be present during the slide illustrated talk.

In organizing the slide show the following points can be kept in mind:

- ***Large number of students:*** *The slide illustrated talk works best with a moderate number of students (up to 50). In case larger numbers are proposed by the school, the talk could be held on more than one day with different groups.*
- ***Teacher-in-charge:*** Having the teacher-in-charge present ensures that the discussions initiated at the talk can be carried on as the programme develops. Further the coordinator and

resource person are then free to interact with the students without having to maintain order and discipline.

- **Interaction time:** The time set aside for interaction needs to be sufficient so that the students have time to open up and talk and the resource person is able to answer queries in depth. Taking into consideration factors like the number of students, the venue, etc. will ensure that the school and coordinator can set up a mutually agreeable time that will benefit the students to the maximum. This is all the more significant because most of the children will not continue in the programme after this session and so this talk could be their only chance to learn more about the biodiversity of West Bengal.

Step 5: Selection of Core Group

Aim: To choose a group of the most interested students who will conceive and implement an action based project to conserve biodiversity

The teacher(s) designated to coordinate the student project team select 25 of the most interested students to form a core team. This group also includes the teachers who will motivate and guide the team.

The concept of an action-based project is introduced to the core group, who are then encouraged to come up with ideas of what is relevant and practical to them

The choice of students for the core group can make or break the project! A group of enthusiastic and interested youngsters can take the project far and ensure that it sustains itself in the future. Interest and not academic performance needs to form the basis of selection.

At this stage discussions can also be held regarding the different kinds of projects that may be possible for their students. Some schools may lack exposure and experience with practical hands-on projects. So such discussions would be beneficial and help determine how much support the school might need in this regard.

Step 6: Local Field Trip

Aim: To help the students appreciate the biodiversity in their immediate surroundings.



A local field trip is organized so as to give the core group an idea of what the term “biodiversity” encompasses. Guided by an expert they examine their immediate surroundings and look at all the various species of plants and animal life which co-exist side –by-side. This field trip is often the students’ first attempt at observing and recording the biodiversity around them. With the trained eye of the expert making even the ordinary extraordinary,

the students discover wonder in their every day surroundings.

The trip could be within the school grounds or in neighborhood, depending on the location of the school. In cases where the school is located in the heart of the city, a near-by park may be chosen as the venue. Ideally, the location should have dense vegetation with a concentration of plant and animal life.

During the trip the students each receive a booklet describing the concept of biodiversity and details of the biodiversity found in West Bengal. It also contains tips on how to identify various aspects of biodiversity and a bibliography of books on the subject

It is important that the local field trip is organized soon after the slide illustrated talk so that the students are able to relate the two experiences while maintaining the excitement of discovery.

Step 7: Visit to a Biodiversity Hot Spot

Aim: To allow the students to experience biodiversity in all its glory and in a more detailed manner

Similar to the local field trip, this excursion is wider in its scope. The students visit a location termed a “hot spot” because it has an intense concentration of biodiversity within it. Locations could be botanical gardens, wildlife or bird sanctuaries, large water bodies, etc.

The right “hot spot” can maximize the learning opportunities for the children. A location which covers a large area and has a concentration of various forms of plant and animal life will allow the children not only to observe various species but also understand and appreciate the inter-dependant relationship they share.



The core group is accompanied on this trip by both the coordinator as well as a few naturalists. The children first undertake a nature walk, making observations and learning about the various facets of



biodiversity from the experts. They then congregate at one spot to play nature games like The Web of Life and Who Am I? Quizzes and discussions keep the students enthralled and interested.

This opportunity is also utilized to discuss the project that the core group is planning to undertake. The experts are able to offer their suggestions and the students can discuss any dilemmas or questions that

they may have regarding the project.

Step 8: Project Formulation

Aim: To design an action based project that the students can participate in with the aim of contributing to the conservation of biodiversity in West Bengal

Under the guidance of the coordinator and core group teachers, the students plan out a project that they can undertake for the rest of the year. The project will help the children understand the issues of conservation and gain first hand knowledge of the biodiversity in their own environment.

The idea of the project would have taken root during the previous step and during this phase the coordinator helps the core group translate their ideas into a workable format. This project planning stage of the project helps the students focus on the task at hand. They are able to look at the practical aspects of putting their plan into action and sort out any bottlenecks beforehand so that their progress is not hampered.

The coordinator visits the school several times to discuss the ideas, work out resources and reiterate all that the students have learnt so far. By discussing various alternatives and bringing varied resources to the board the coordinator can ensure that the project does not get limited to making charts and collecting data. Experts can also be brought in if the school so desires to help explore various possibilities and narrow down their choices.

By the end of this phase the students will have planned their project, prepared a work plan and acquired the relevant permissions from the school authorities. They are now ready to launch their project.

Step 9: Monitoring of Ongoing Project

Aim: To keep the projects on track and provide support, as may be needed

Once the project has been planned and a work plan is put in place the core group starts putting their ideas into practice. The core group teachers provide any guidance that is required and help the students maximize their experience.

The most interesting and important part of the project is now underway! The coordinator visits the school regularly to monitor the progress and provide any support in terms of resources and advice that may be required. The visits help to keep the students motivated and ensure that the projects are proceeding without hindrances.

Step 10: Project Sharing Workshop

Aim: To allow the students to share their experiences with other schools and showcase their projects

To interact with students from various localities and places and learn from their experiences

By the end of the cycle the core group would have progressed substantially with their projects. Since most of the projects are planned as on-going activities which will accommodate subsequent batches of students, it is not expected that the projects would have come to an end. The project sharing workshop thus provides a platform for the students of various schools under the programme to come together and share their experiences so far. Not only can they showcase their progress but students



can also learn from each other and incorporate new ideas into their activities.

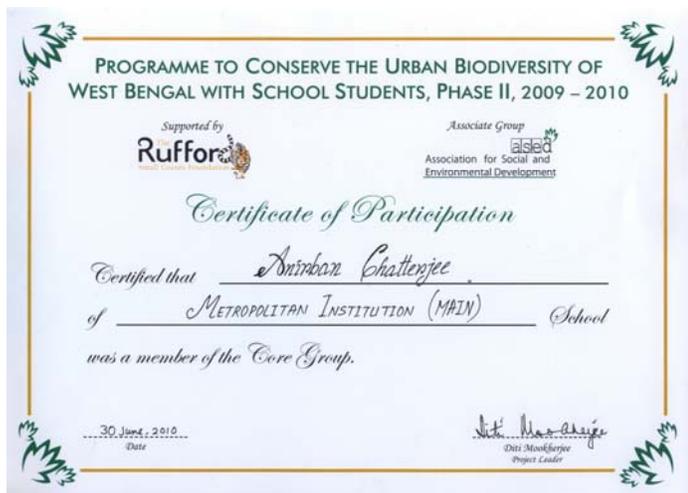
The workshop is organized in a conveniently located hall or auditorium and is held over a single day. It starts with special guests speaking about biodiversity and related issues and continues with a slide presentation of the various projects that have been undertaken so far. Each school then takes the stage and speaks about their project. Some time is allowed after each presentation for discussions.

The project sharing workshop acts as a great incentive for the students and teachers alike. It provides an interesting platform for learning and encourages lively discussion among the students. The preparations for the workshop need to start well in advance. Some schools may need ideas on how to exhibit and showcase their work, especially if they want to do it innovatively. The coordinator plays an important role in guiding the students in this regard. If required sessions on project exhibition can be planned, bringing in resource persons who can help the children go beyond hand drawn charts to showcase their work.

The workshop schedule could also include interesting speakers, short films, games, quizzes or activities to make it interesting for the assembled students and giving them various platforms to intermingle.

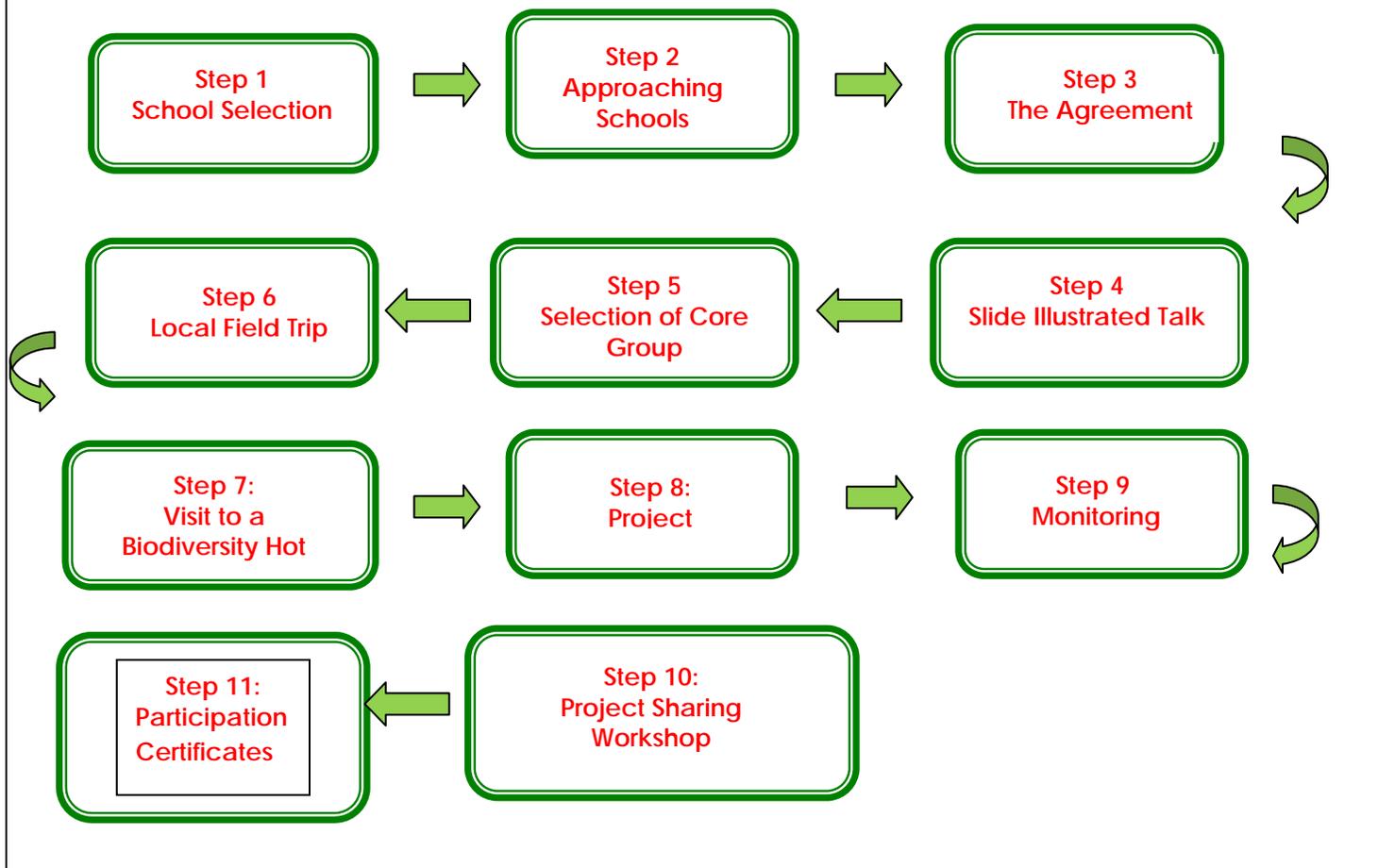
Step 11: Participation Certificates

Aim: To give the Core Group members recognition of their contribution to biodiversity awareness and conservation



At the conclusion of the Project, participation certificates are given to all the Core Group students in recognition of their efforts.

A Diagrammatic Summary



SUSTAINABILITY

After the project sharing workshop, the core group starts winding up its activities and prepares to orient a new core group into the project. This group will go through the same process as their seniors. However when it comes to project planning they will work on ways by which they can take the existing project further and build on the work of their seniors.

BENEFITS

By involving enthusiastic youngsters and encouraging them to become conservationists, ASED's *Programme to Conserve the Urban Biodiversity of West Bengal with School Students* has the potential to start an entire movement among the student population. Each of the three groups involved in the process, viz. the school, the students and the implementing organization all benefit in various ways in this programme.

For the school, the programme offers an opportunity to set up an on-going school project on biodiversity conservation with expert help and guidance. Through the implementing agency, the school gets access a vast array of resources which it can then use to run the project in the best possible way and get the maximum possible benefit for its students.

The students learn to formulate and implement a conservation project. The experience helps them to take environment education out of the school books and into the realm of reality. With exciting and proactive projects the students also learn that every effort at conservation can reap benefits for the world we live in and even as students they are able to make a difference.

The implementing agency's focus is to use the programme to develop a growing band of young people who are aware of the biodiversity around them and the issues that are connected to it. They can then become agents of change themselves and spread the message of conservation far and wide.

The programme also allows the organisation to develop a model for biodiversity conservation for the youth and test out its feasibility in a monitored environment.

CONCLUSION

The process recorded above has been developed over the last six years that Diti Mookherjee and ASED have been implementing the its *Programme to Conserve the Urban Biodiversity of Kolkata with School Students* and the *Programme to Conserve the Urban Biodiversity of West Bengal with School Students*. Many lessons have been learnt on the way and the original plan has been modified and adjusted whenever the situation has demanded it.

By being flexible and leaving space for new ideas to be incorporated along the way, the programme has been able to address the various needs of its student beneficiaries in an effective manner.

The process is not sacrosanct and is still evolving through experience and experimentation. The foundation has been laid firmly and it is now time to take it into another realm.

Annexure 1

REGISTRATION FORM for

Programme to Conserve the Urban Biodiversity of West Bengal with School Students

School:
Address:
Telephone No:
Fax:
E-mail:

We agree to participate in the "Programme to Conserve the Urban Biodiversity of West Bengal with School Students" being conducted by the Association for Social and Environmental Development and supported by the Rufford Small Grants, UK.

We have been a part of the "Programme to Conserve the Urban Biodiversity of West Bengal with School Students" held in 2007-2008. We agree to continue with the project work that was initiated by the Core Group during this period.

We will also participate in the activities as per the schedule given below:

<u>Activity</u>	<u>Time</u>
Sensitization Programme in School	Dec to April
Interactive Slide- illustrated Talk on "Biodiversity of West Bengal"	Jan 09
Appointment of new members of Core Group	Jan 09
Local Nature Trip with Core Group	Feb to March, 09
Visit to Biodiversity Hotspot with Core Group	March to April, 09
Project Work and Follow Up	May, 09 to Dec, 09
Sharing Workshop, Report Submission	Dec, 09 to April, 10

We agree that 25 students and 2 teachers from Classes 7 and 8 of our school will be the Core Group as per the Programme guidelines.

The two teachers appointed for the Core Group are:

Name: _____ **Signature:**

Contact Number:

Name: _____ **Signature:**

Contact number:

Signature:

Principal

School Seal:

Name

Date:
Place:

Annexure 2

Examples Of Some Projects Undertaken by Schools

- Survey on the status of water monitors and campaign to preserve their habitat
- Local Awareness campaign and tagging of trees in the school
- Maintenance of school garden
- Medicinal plants garden
- Study of local biodiversity and tree plantation

ASED

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Programme to Conserve the Urban Biodiversity of West Bengal with School Students

**Evaluation by
Abdul Hannan, Soumita Basu, Sujit Sinha**

11June, 2010

Abdul Hannan, M.SW, has worked as health supervisor for rural projects for 15 years. He has also carried out a pilot project to bring about synergy between child education, local village government, and NGOs.

Soumita Basu, PG Dip Journalism, has worked briefly as a broadcast journalist and has been involved with social research and documenting best practices in the development sector for several years

Sujit Sinha, Ph.D Chemistry, has been involved with alternative education and sustainable agriculture experiments in rural and urban areas for the last 20 years.

The Project

Diti Mookherjee, as Project Leader along with a team from ASED has been working on biodiversity conservation with school students of 4 schools in Kolkata, 1 in Howrah and 2 in Durgapur with funding support from Rufford Small Grant. This phase of the programme is 18 months long and follows two phases which were also funded by Rufford Small Grant under the name of “*Programme to conserve the urban biodiversity of Kolkata City with school students*” in October 2004 and “*Programme to conserve the urban biodiversity of West Bengal with school students*” in 2007.

Our main task was to evaluate the present phase of the programme by visiting the participating schools, discussing in details with the Core Group students and teachers, interviewing all the ASED staff members associated with the project, assessing the materials provided by the programme and attending the project sharing workshop. The evaluation was spread over a period of 2 months between 14th April and 10th June, 2010.

The main aim of this phase of the ASED programme was:

- a) Increasing awareness about biodiversity conservation in all the schools and especially the 2 schools in Durgapur by providing technical inputs. To increase biodiversity awareness among the people of Durgapur.
- b) Institutionalize the school projects for the 5 Kolkata schools since this is the third phase of intervention and start the withdrawal process so that the schools can continue with their own projects with minimum support from ASED.
- c) Promote networking among the 7 schools through e-mail, website and visiting each other’s school projects.
- d) Promote networking of the 7 schools with government and other agencies.

The evaluation looked at the following:

- A. Sensitization and Knowledge of biodiversity among the students
- B. Teaching Aids and Methods used
- C. The role of Teachers
- D. Specific activities related to biodiversity taken by the schools
- E. Integration of the programme within the school curriculum and routine
- F. Sharing and networking within and among the participating schools
- G. Larger networking and links with works of other agencies
- H. Increasing Awareness of the local people

Schools visited by the evaluation team are (**details attached as [Annexe 1](#)**):

1. Durgapur Taraknath High School, Durgapur
2. Metropolitan Institution (Main), Kolkata
3. Childrens’ Foundation School, Kolkata
4. Sarengabad Jajneshwari Pathshala Girls’ High School, Kolkata
5. Surendranath Girls School , Santragachi, Howrah
6. Ananda Ashram Girls High School , Kolkata

Note: One of the seven participating school, Sagarvanga Government Sponsored High School, Durgapur, have dropped out of the programme.

A. Sensitization and Knowledge of Bio diversity among the students

Achievements and Issues

The students of the core group and the teachers-in-charge have an understanding of what biodiversity means and the possible effects of losing this biodiversity. While interacting with the students it was seen that they were not restricted to memorised definitions of biodiversity as might be found in the text books. But they brought out the meaning as understood by them in their own words. Students of all the school could explain the relation between plants and their importance in human life

As expected, there was disparity in the levels of knowledge seen at the various schools (just like bio-diversity). Schools like Durgapur Taraknath High School, Metropolitan Institution (Main), Children's' Foundation School, Sarengabad Jajneshwari Pathshala Girls' High School had basic understanding of biodiversity and promptly talked about food chain while relating the importance of biodiversity. But they always also talked about oxygen levels in the air. Though students of Surendranath Girls School were also aware of the concept of biodiversity, they couldn't relate it with any example or any everyday issue. Ananda Ashram Girls High School, on the other hand, had commendable idea of bio diversity and could explain the concept with concrete examples of the importance of biodiversity linking it to pollination, soil conservation, water level conservation, crop diversity, etc. This level of knowledge in the students of Ananda Ashram Girls High School may be due to both ASED's efforts as well as the extensive work on various environment related issues the school is otherwise also known for. This school has once reached the national level and once the state level at the National Children's Science Congress. Also, in most schools, students were more focussed on the importance of plants and trees in the environment, while the role of the animals need more discussions. To some extent, there was the predictable confusion between overall Environmental issues and the issue of Biodiversity.

Our overall impression is that whatever ASED has done has got many children and some teachers excited about the issue of biodiversity ; and generally made them competent in observation , outdoor work, some hands on work, writing charts and displaying, making presentations, working in groups. So the ground is fertile to move to the next stage.

Recommendations for future:

The next step will be to broaden and deepen the concept of biodiversity and relate it more intimately to student's own life and environment. Then they can more actively start thinking of the need for conservation of biodiversity.

1. Introduce the diversity found within any one species. For example, different varieties of rice or potatoes or tomatoes or bananas or apples, food which the students can immediately relate to.
2. Talk of biodiversity in plants and animals influenced (both encouraged and discouraged) by humans. We humans have bred many kinds of plants as well as animals for particular characteristics. Mango is a very good example and so are domestic dogs. Such orientation will help the students think more deeply on the issue. *(Simple and enjoyable survey work can be given to students including some "research" to find out about particular varieties , what is so special , why they like them etc for both the above two points)*
3. Give specific real life examples on the consequences of the loss of biodiversity .This could also include the strong criticism of planting only eucalyptus in social forestry programmes for many years and its various ecological and social dimensions.
4. Orientation on biodiversity may also include issues and debates like genetic modification, BT cotton , BT brinjal, patenting life, etc. These are recent debates and are largely covered

by the media regularly. If the children can refer to such issues as part of their work, they will understand better and will be motivated towards 'finding out' more about such topics. *Dividing the class and asking them to argue both sides of the issue by collecting arguments from media can itself be a very enjoyable and learning activity.*

5. Extend orientation to practical ideas and practices of biodiversity conservation. Special emphasis may be given to traditional conservation practices, like that found in Kokkare Bellur. This shall also help the children appreciate traditional knowledge and practices, which they might be able to use as well.. This is particularly important because of the significance of 'local' specificities for biodiversity.

B. Teaching aid and methods used

Achievements and Issues:

The project has published a booklet on Biodiversity of West Bengal for the core groups. This book has some interesting information but the students found it too difficult to read, and it was even difficult to use by the teachers-in-charge.

The main learning methods used was an introductory slide show, exposure visits to hotspots like the Botanical Garden and walks around the neighbourhood of the school. The slide show was conducted by Kushal Mookherjee at the very beginning and students who were most motivated by the slide show became a member of the core group (up to 25 students). They played the game "web of life" to explain how whole of nature is interconnected and the destruction of one link can jeopardise the whole web. Children's' Foundation School has a nice song on biodiversity which they sing often in school.

Recommendations for future:

This aspect of the programme needs most amount of efforts in the future.

1. Use of stories, songs and poetry might be more effective for children to understand and internalise the concept of biodiversity. The stories may include the reports of consequences of biodiversity failing like in the case of the Great Irish Potato Famine (1740-1741), stories on endangered species, non availability of salt tolerant rice after cyclone AILA in Sundarbans or deep water rice after flooding and general loss of diversity of rice within India. Few stories on efforts towards biodiversity conservation, both traditional practices and current efforts that are being made. There is a nice catchy song on "saving" Kolkata by Anjan Dutta, although not specific to bio-diversity, which can be introduced. *In fact, students can be asked to write stories, poems and songs on bio-diversity and that can be quite an exciting activity and provide Teaching Aids for Biodiversity classes in future.*
2. The pedagogy: The form of orientation and sensitisation has to be more engaging and creative. Instead of only a lecture mode, more discussions and debates may be encouraged so that the students are also made to pro actively think about the issue. Hence the lesson plans should be made such that the children are able to engage in both actively 'doing' and actively 'thinking' about the process. *An example is given in [Annexe 2](#) which has some crucial pedagogic elements --- use of story which is always very attractive to children and they understand issues much better; the story has elements with which children are familiar; it is open ended so that children have to think and be creative; there can be multiple answers encouraging debate and discussion..* ASED can take the help of other resource organizations to develop such pedagogically interesting materials. And as mentioned above, the teachers and students can also get into the act of creating such open ended stories.
3. Manual: It can be very useful for the teachers if ASED could give a manual of various activities that can be done for biodiversity education. A very good one already exists ---

the Activity guide produced by National Children's Science Congress, India. The 15th National Science Children's congress 2007 was specifically on biodiversity. In fact discussing that manual, after giving it to all teachers, itself would provide a host of ideas to the schools. That manual is fortunately available in both English and Bengali.

4. Films may be used to raise awareness on biodiversity. Properly chosen they will be both entertaining and illuminating. And if worksheets can be given to make children do more thinking and creative activities and exercises related to the film, then there will be a greater impact on the students.

TERI has a few award winning films on biodiversity. More can be found at Centre for Environment Education (CEE), Centre for Media Studies (CMS), among others. There is a film on the traditional conservation of birds in village Kokra Bellur

5. Field Study Recording: Ananda Ashram Girls High School, Children's Foundation and Sarengabad Jajneswari Pathshala Girls' High School have specifically asked for training in field study methods and documentation. The teachers felt that learning this is very important. Some filled up field study tables should be provided to guide teachers and students
6. Games: Many students and schools wanted more use of games as teaching aid like the one used for "web of life".
7. Teaching Aids from Others: Ideas from various organisations and websites that discuss teaching learning materials can be surfed. There will be some teachers who are comfortable doing this. So a task force consisting of a person from ASED and some internet savvy interested teachers can be formed to do the necessary surfing, downloading. These will have to be translated and adapted as per local conditions Some of these sources are :

- a. Indian Journal of Environmental Education is a refereed journal, dedicated to the publication of researched articles in the field of environmental education and methodologies. This is published by C.P.R. Environmental Education Centre (CPREEC), a Centre of Excellence of the Ministry of Environment and Forests (MoEF), Government of India, established jointly by the Ministry and the C.P.Ramaswami Aiyar Foundation . This annual journal can be downloaded from (<http://cpreec.org/pubperiodicals-indjournal.htm>).
- b. There are many websites with a particular focus on helping teachers in the process of developing exemplary lesson plans : (http://www.hotchalk.com/index_new.html) and (<http://www.lessonplans.com/>) for teachers and student from kindergarten to class 12th.
- c. Activities and materials used and encouraged by North American Association for Environmental Education may be adapted for the West Bengal Schools. These can be downloaded from (<http://eelink.net/pages/EE+Activities+-+Biodiversity>)
- d. National Geographic has created an educator's guide. To observe 2010 as the International Year of Biodiversity, they have also made a few good teaching learning materials (TLM) for biodiversity in schools. The Educator's guide can be downloaded from National Geographic's website (<http://www.nationalgeographic.com/wildworld/pdf/educators.pdf>) along with other interesting IEC materials on their website (<http://www.nationalgeographic.com/wildworld/educators.html>).

If such interesting materials and lesson plans are tested and ready, many schools can be oriented and they can pick and choose what they would like to do. Then quite a few schools will be able to do it themselves with the minimal amount of encouragement and support.

C. The Role of Teachers

Achievements and Issues:

Some of the teachers are quite motivated and interested. Most, but not all, who are involved are geography teachers. In all schools, teachers felt that they should have got more intensive inputs separately from the Project Team. They were not satisfied with just being present when resource persons came and did something with the students, or just attending joint meets once a year where their students made some presentations.

Recommendations for future:

Increasing the capacity and empowerment of teachers is the most important task

1. A written concept note of the project should be ready in both English and Bengali to be given to all the teachers and principals getting involved. Care should be taken to give this to any new teacher getting involved as sometimes, teachers do change.
2. In any future project, the first event should be a separate orientation for teachers involved. Here the concepts, project ideas, past experience should be shared with them. They should be given enough space to think and come up with their own questions and ideas. And also be involved in planning the whole project to give them a sense of ownership.
3. Such events for teacher's experience sharing and brainstorming should be held every three months.
4. See also D below for lesson planning workshop with teachers.
5. Teachers involved should be facilitated to exchange telephone numbers, emails (if they have), and regularly interact with each other.
6. Teachers should also be "allowed" to call ASED directly, instead of going through Heads, in case of any need or clarification.
7. If possible the quarterly meeting should be held in a separate school by rotation so that everyone gets to see the work done by other schools, and there is some kind of peer monitoring.
8. Research, innovations have to be encouraged; those who can do internet search have to be facilitated to do so.

D. Activities done by the schools

All the schools made a presentation of their work at the project sharing workshop at Birla Planetarium on the 22nd of April, 2010. All of them had made charts which had names of a few plants and animals, their scientific names, phylum, class, family, and sometimes, their characteristics including medicinal and other use.

Most of the animals mentioned were the common ones like dog, cat, cow, crow, mosquito, fly, which the students are already familiar with. This was good as it meant children with help of teachers had to go and find out these things and would probably need some "reference work". Metropolitan Institution (Main) also made a Herbarium. The plants catalogued were also only few of the local species found. Just cataloguing the common plants and animals can be a starting point which may soon be made into an exhaustive cataloguing of school and neighbouring plants and animals. This would add more value to the work. The students might also come across many unfamiliar species and would involve much more investigation, observation, recording, reference work, asking knowledge centres like ASED and Biodiversity Board. For example, an organisation has already catalogued all the trees in the Southern Avenue area of Kolkata. Taking an initiative, Ananda Ashram Girls High School had plans to label all the trees with their common and scientific name in their locality from World Environment Day on 5th June this year.

Sarengabad Jajneshwari Pathshala Girls' High School did an interesting project on conserving *Water Monitor Lizard* (*Varanus salvator* / go-shap), a reptile found in Bengal which is now one of the endangered species. They designed and conducted a water monitoring project in and around a new high rise residential complex in the locality. They observed all the water animals, specially the Go-Shap - their eating habits, how many they are in number, their daily routine, etc. The students drew maps before and after the residential complex was built, and sent the before-after map to the Department of Environment, who in turn sent it to State Biodiversity Board . The people from the residential complex and the Board sat together to discuss how the building was detrimental to the biodiversity conservation of the area, especially for the already endangered Go-Shap. After a lot of discussion and brainstorming, a space for bio conservation within the residential complex was created. This space was kept untouched by the residents of the complex and this created a liveable environment for the Go-Shap.

Ananda Ashram Girls High School worked on biodiversity within the school campus. They also planted a gourd flower and observed its growth carefully, trying to save it from various natural problems as well as from other students of the school who maybe tempted to pluck it. They started a garden in the school and also encouraged students to have one at home, especially of herbal medicines. As part of biodiversity survey, they made a map of the school, mapped the greenery, location of trees and the concrete parts, and wrote the scientific names of the trees. They later improvised on this project on their own and identified all the trees on NSC Road, where on NSC Road are they, which tree attracts more animals/birds, recorded the difference between such bio diversity on the main road and in the lanes. NSC Road is one of the longest roads in Kolkata, on which the school is situated.

Surendranath Girls School observed the life circle of butterfly, planted trees and plants at school and at home, especially of herbal medicines. They also did an interesting project of preparing organic manure by using worms.

Recommendations for future:

1. Making maps has to be encouraged as the 3 schools who did this found maps to be very useful in learning about their local biodiversity. The students had fun while making it and these maps could be referred to for many other projects as well, which was very motivating for the students.
2. ASED can help the schools to make an exhaustive list of all the plants and animals in their locality, instead of recording a few already known ones.
3. Apart from only cataloguing, making a neighbourhood tree map may be useful, specially where trees are quite scarce and might be cut down for “development” like around Metropolitan Institution (Main).
4. Documenting “what changes have taken place with respect to Biodiversity in the locality” can be quite interesting for the students. The primary method of data collection can be interviewing few old residents of the locality. This is fun and hones various skills.
5. There will be a better impact on learning if the children are encouraged to identify specific local problems or threats to biodiversity. Based on this, if possible, they can also initiate some “action”. From the work by Sarengabad Jajneshwari Pathshala Girls' High School on “go shap”, it can be seen that children have been more engaged in the issue by such activity and have also been more motivated than others.
6. All the schools suggested that ASED should take more regular feedback on their project and see the impact. There can be a quarterly review of the work. For this purpose, ASED can also give some kind of worksheet/evaluation sheet to the teachers. These will help them

- a. To see if there is an increase in awareness in the students.
 - b. To identify the project gaps. Evaluate ASED's working methods, worksheets, etc.
 - c. In motivating the children.
7. The students and maybe many teachers were too focused on scientific names. But that was not at all the purpose of ASED's intervention. So in future ASED has to be careful of schools attaching undue importance to certain facts –issues.
 8. All the school asked for more project ideas from ASED. *As mentioned in B3 above, the "15th National Science Children's Congress 2007 manual" is full of ideas and should be obtained and circulated in future.*

E. Integration of the programme within the school curriculum and routine

Achievements and Issues

Principal of Ananda Ashram Girls High School explained how they have such a rich background of environment education in their school, "We teach according to the EVS syllabus. We try to adapt all the projects, including ASED projects within the fold of the EVS syllabus. This way the project doesn't demand more time and is a part of the curriculum."

Teachers of most schools visited, voiced similar opinion that the programme will be much more effective if it is integrated with the syllabus. It will be more helpful for the students for their studies as they will be able to better relate to the textbooks while doing the practical work and vice versa.

The other advantage would be that understanding "biodiversity" through activities will not remain a special focus for a specific core group, but everyone will participate in knowing and acting on one of the most crucial issues for our existence today .

This integration sounds easy, but none of the other schools have been able to do such a smooth job.

Recommendations for future:

It is extremely important that ASED, in a joint workshop with teachers, identifies all the chapters of all subjects to see where "bio-diversity" is already mentioned or there is a scope for introducing the various concepts of "bio-diversity". Then utilize that opportunity to bring in the related lesson plan, materials and activities. This will require an intensive workshop of 5-6 days broken into several instalments of 1, 2, 3 days . Ideally there should be a follow up workshop of 3 days after a year of trying out these lesson plans to do appropriate modification. But ASED should also involve experts in pedagogy, material development like DRCS, Shikshamitra in these workshops. Fitting things into the school routine is not such an easy matter because of various constraints but once that is done, the chances of widespread replication increases dramatically.

[Annexe 3](#) gives few examples of the chapters in the textbooks of class 7 and 8 of West Bengal School where there is scope of such integration, although bio-diversity is not specifically mentioned. This term has been used in Environment books of Classes IX – XII.

F. Sharing and networking within and among the participating schools

The main form of sharing has been the annual fair or workshops where the schools present their projects. However, due to limited time the schools cannot get into an in depth discussions, debates on recent issues or brainstorm over any project idea.

Recommendation:

1. Schools should be encouraged to visit one another and their project sites. Students of Children's Foundation expressed an interest to the evaluation team and to their principal to go and see the work of Sarengabad Jajneshwari Pathshala Girls' High School. ASED may help them plan and schedule such a visit.

Dissemination of the knowledge on biodiversity is generally seen to be restricted within the core group. Children have been sharing with their classmates and friends who are interested. Such informal sharing by students are also only restricted to their classmates and few chosen friends. Better sharing is seen where the core groups have been able to use the platform of the Eco clubs of their school.

Recommendations:

1. Use of news boards: Children should be encouraged to keep a news board at a common place in the school. They should collect news items on biodiversity from various sources. This can be interesting for the students and also raise awareness of all the students beyond the core group. To initiate this, ASED might themselves have to supply the news items from various sources for a few months till the students get hooked and feel interested enough to do it themselves.
 - a) A good source of news is a site maintained by CSE on environment, with a special section on biodiversity that is collected from over 15 national dailies (<http://indiaenvironmentportal.org.in/taxonomy/term/3486?page=1>)
 - b) Newsletter of "India Together" can also be a good source. They have a special section on biodiversity under environment page. (<http://www.indiatogether.org/environment/biodiv.htm>).
2. Documentation of the learning from this programme across all the phases has been suggested by Ananda Ashram Girls High School. They also suggested that ASED can publish a booklet detailing all the projects taken up by the participating schools. This will help the schools to replicate the work in the future. It can also be used as resource material for other schools and can be a good tool for sharing. If a certain school project is very interesting it can also be video documented for future reference, sharing among schools and also in other schools outside the purview of the programme where it can act as a good IEC material.
3. Filming ASED's slide presentation on Biodiversity in West Bengal given by Kushal Mookherjee can be a good IEC resource for any school introducing biodiversity to their students.

G. Larger networking and links with works of other agencies

Achievements and Issues

It is now well recognised that biodiversity is one of most crucial issues for the coming generation. Therefore, effort to start children thinking about the issue as early as possible is important. For ASED to play an effective role in this spreading of biodiversity education, they must *have widespread collaborations with many agencies*. ASED is already linked to State Biodiversity Board. And this Board has collaborated in the Go-Shap project done by Sarengabad Jajneshwari Pathshala Girls' High School. ASED is also quite linked with the NGO DRCS specialising in environmental education. In three of the schools, namely, Metropolitan Institution, Children's Foundation and Ananda Ashram Girl's High School, both

ASED and DRCSC have intervened since April 2008. There could have been more collaboration with DRCSC on actual lesson planning and materials. ASED is already quite closely linked with WWF.

Recommendations for future:

1. Collaborations with Kolkata based NGOs DRCSC, Shikshamitra and others to develop lessons and materials (and evaluations) as already mentioned in Section D above (along with school teachers).
2. Provide crucial inputs based on own experiments, lessons, materials to agencies which are responsible for eco-clubs in various schools, specially Paschim Banga Vigyan Mancha .
3. Develop links with SCERT who are responsible for syllabus and teachers training of all government schools.
4. Strengthen relations with State Biodiversity Board as to an extent their mandate overlaps with this project. See below

West Bengal State Biodiversity Board, <http://wbbs.gov.in/activities.html>

* Conducting biodiversity related workshops for different target groups viz., school, college and university students, teachers, researchers, scientists, policy makers, BMC members, industries, farmers, breeders, holders and creators of indigenous and traditional knowledge.

* Publications on Biodiversity of the State: The Board has published a number of books, booklets, pamphlets, brochures and posters for communicating various biodiversity information and messages for the common people, school, college and university students and the scientific community

This is the project list of the bio diversity board:

<http://wbbs.gov.in/projects.html>

* The project “Conservation & documentation of wild biodiversity in Bethune College Campus (2009-10)” can be explored to see if it can be adapted for schools.

* The project “Diversity, Distribution & Ecology of Butterfly communities of West Bengal” may be used for training purposes.

5. Network with similar projects across India to exchange ideas and collaborate.
 - a) Join UNDP solution exchange on environment and school education to get an idea of what is happening all over the country and then get linked to some of the institutions doing similar work. (See <http://www.solutionexchange-un.net.in/se.html>)
 - b) The GEF Small Grants Programme (SGP) has over 131 projects on biodiversity across India since 2001 (<http://www.sgpindia.org/Thematic-area-wise-projects.html>). An outline of one of the GEF SGP project is given below.

Manav Sadan Vikas Sanstha (MSVS), Mumbai, Maharashtra

“Promoting Local response for Biodiversity Conservation through Establishment of “Centers of learning” in secondary schools of Ratnagiri & Sindhudurg districts of Maharashtra”

Grant Amount: Rs. 8, 00,000

The goal and purpose of the project is to promote local response for the demonstration of conserving biological diversity through involvement of school children. The project proposes to promote local response of the school children for conserving the natural resources of Ratnagiri and Sindhudurg District, to involve various techniques, such as survey of flora and fauna of the regions, demonstrate the conservation of ecologically important (endangered species) plants through establishment of gardens of medicinal plants in and around the schools and create public awareness through formal and non formal methods among various strata of the society, about the importance of environmental protection.

6. Have more active links with nodal agency Centre for Environmental Education (CEE), Ahmedabad. They are running a diploma programme for teachers in Environmental Education. (See http://www.greenteacher.org/?page_id=110)
7. Maintain links with WWF India .They are observing the International Year for Biodiversity - 2010. There are options of sharing pictures. Children can send in pictures of their work (definitely efforts like Sarengabad) and be published by WWF. They would carry credits every time the picture is used. (See http://www.wwfindia.org/about_wwf/)
8. This linking up and then maintaining those links should not be the exclusive task of ASED staff. There should be a teacher’s group which will gradually take over this responsibility. This is quite crucial as otherwise ASED will be totally overwhelmed.

H. Increasing Awareness of the Local people

Students of Ananda Ashram held an awareness programme where they invited the parents and local people and shopkeepers during the Environmental week in 2008.

Sarengabad Jajneswari Pathshala Girls’ High School took a lot of information on the locals while collecting data for their project. This process helped the students to increase their awareness levels by building a relation with the locals.

Recommendations:

1. A student from Children’s’ Foundation also thought of starting a neighbourhood group with friends around their home and explore the area, find out about the local plants/animals, know more about them.
2. Local people may be involved while doing the “historical change in biodiversity” survey

Annexe 1

Evaluation Visits schedule

Name of Place visited	Date and time of Visit	Persons met
ASED, Kolkata office	16 April 2010	Diti Mukherjee, Kushal Mukherjee, Indrajit Mullick, Susmita Basu
Durgapur Taraknath High School, Durgapur	19 April 2010,	In separate discussions with; Tarun Kumar Panja (Geography), Principal. And 25 students of the core group (all boys)
Birla Planetarium	22 April 2010, 11 am-3pm	To attend the sharing workshop
Surendranath Girls School, Satragachi	26 April 2010, 3.05–4.05 pm	Joint interaction held with teachers in charge, Manjulika Naskar (Pure science teacher); Nandita Chakraborty (Arts teacher), and 50 members of the core group
Sarengabad Jajneswari Pathshala Girls' High School, Kolkata	03 May 2010, 2.05–3.05 pm	Joint interaction held with Teachers in charge of the core group is Sanghamitra Majumder (Geography teacher), Kamalika Ghosh (Geography teacher) and Moly Roy (Life science teacher) and 23 students from the core group.
Children's Foundation School, Kolkata	04 May 2010 10.30 am – 12.10 pm	Joint interaction with teacher in charge Chhabi Sinha (Biology teacher), Sutapa Chakraborty (Principal) and all ten present core group members – 5 girls and 5 boys.
Ananda Ashram Girl High School, Kolkata	05 May 2010, 2.30–3.45 pm	In two simultaneous discussions with the teachers and students: Sushmita Mukherjee, core group in charge (English teacher), Krishna Banerjee (Geography teacher), Sharmistha Bhattacharya (Principal) 12 students from the core group
Metropolitan Institution (Main), Kolkata	20 May 2010 2–4 pm	Joint interaction with teachers in charge Subhrakanti Roy (Life Science & education since beginning), Swapan Kumar Ghosh (Chemistry) and 10 of the 12 students (boys) of current core group.
ASED, Kolkata office	26 May 2010, 3-5 pm	Diti Mukherjee, Kushal Mukherjee, Indrajit Mullick, Susmita Basu for more information and sharing of evaluation results till then.

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Annexe 2:

For example, the concept of variety and diversity within a particular species, and the consequences of such biodiversity failing can be explained thus,

It was around seven in the morning and the market of Kokilpur village was bustling with activity. People are selling all different kinds of fruit and vegetables – lush green spinach and bright red tomatoes! And giving them company sits potatoes and papaya and pumpkin. In the middle sits the rice family. They are many many kinds. The rice family is very interesting – they all look quite different from one another! Some are small, some are thin and some looking brighter than the others. And they all had a different kind of special quality about them that no one else had and all of them also had a special friendship with different people. Like, if you asked the farmers, they would tell you how one member of the family were friends with rain, and even if there is rain and flood, this member of the rice family would always be safe, and another member was especially friendly with salt. This way each member enjoyed a unique special friendship.

Like many others in the village, Ravi used to grow many such members of the rice family and sell them in the village main market. One day, a greedy businessman from the town came and told Ravi that if he left this family of rice and instead start growing one kind of rice which no one knew about, it was not found naturally in the area and the businessman made it in his lab through an experiment.

Ravi was very confused. He didn't know what to do. He was a poor farmer and earning triple the money will help him send his son and daughter to a good school. Also, he can buy good clothes and food for them, which he can't now. It was difficult for Ravi to decide. Ravi went to his friends to ask what he should do?

If you were Ravi's friend, what would you have advised Ravi to do? With what reasons would you explain that to Ravi?

(Give the students 15 minutes to write. After the students have written it, continue...)

Ravi's other friends also gave him different advise. There was no agreement among his friends. This confused Ravi even more. But one day, his wife told him that for their children, Ravi should start growing the rice the businessman has given him, even if Ravi doesn't know much about the crop and is not sure of it. This will secure the future of their children. 'It's just rice after all! Can it be that bad??' she argued.

This rice did triple his income. Seeing this, all other farmers also wanted to grow only that kind of rice. But the old school teacher of the village started telling everyone that this will only harm them in the future. The money they will get only momentary, they will lose a lot of things in the long run.

Farmers from the nearby village also heard of the Ravi's triple income and wanted to grow the same rice. The businessman also wanted that all other farmers of Kokilpur village and its neighbouring villages to grow only that laboratory rice. The old school teacher wanted to stop everyone from doing the same thing. But he couldn't go alone. So he needed help.

Do you agree with him? Why? If you were the old school master what would you have done now? How would you have spread the word and convince the farmers to stop growing that laboratory rice?

(Give the students 15 minutes to write. After the students have written it, continue...)

But the old school master couldn't spread the word. He couldn't even convince any of the farmers in Kokilpur village. So soon, all the farmers were only growing the laboratory rice. The big rice family slowly died. Only the laboratory rice was living but one day it started raining very heavily and soon it was flooded. The laboratory rice started feeling sick in the flood but it didn't know what to do. It was not friends with the rain and floods. Even the farmers didn't know what to do. Soon, the laboratory rice died too. All the farmers started crying, as there was nothing to sell in the market, there was nothing to eat. The old school teacher cried the most. "I told you not to stop growing the other rice family members! But no one listened," the old school teacher cried. But still a few farmers couldn't understand why the old school teacher was saying this.

If these farmers came to you to know why the old school teacher was saying this, how would you explain it to those farmers?

If you also lived in Kokilpur village, what would you do now?

(Give the students 15 minutes to write. After the students have written it, continue...)

Note: At the end of this exercise, the story of how the Cyclone AILA wrecked the agriculture of West Bengal for three consecutive years can be told. Details of how this wreck could be avoided if the traditional saline resistant rice variety was still found, how just one variety of high yielding rice is found instead of the diverse of traditional rice varieties, the consequential agricultural difficulties and food shortage. With a recent incident like Cyclone Aila that had hit West Bengal in 2008, the students will be able to relate to the issue better.

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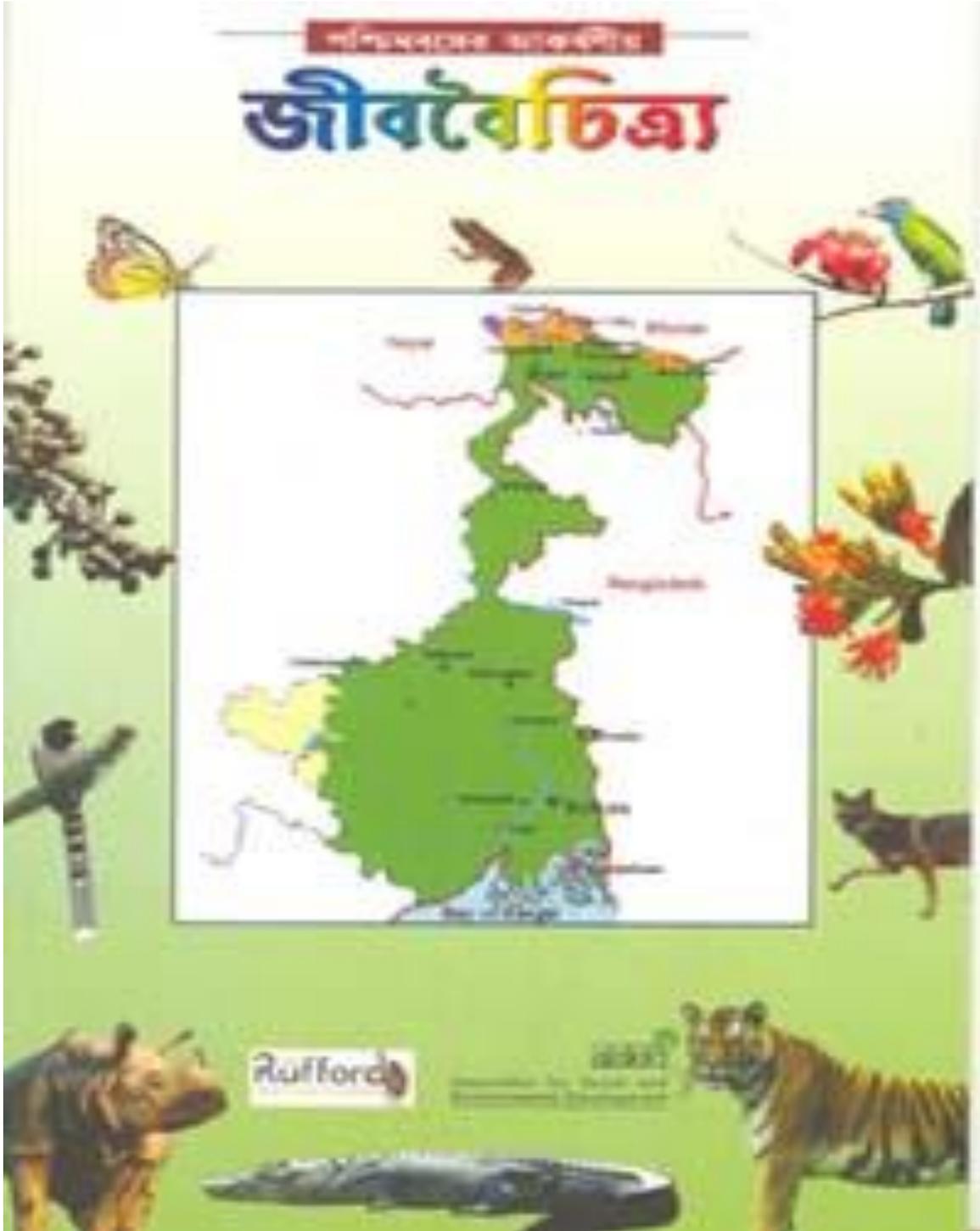
Annexe 3:

Few examples of chapters in the textbooks of class 7 and 8 of West Bengal Schools where the concept of biodiversity can be introduced

Class, Subject, Chapter	Chapter Details
Class 6, Life Science, Chapter 4	Man and his environment <ul style="list-style-type: none"> • Primary and external formation of plants and animals • Observation with easiest experiment of plants and animals
Class 7, Life Science, Chapter 3	Outline idea and importance of the following plants and animals: <ul style="list-style-type: none"> • Plants: Paddy, wheat, maize, pea, masur, jute, cotton, Sal, coconut, mustard • Animals: Honey bee, Silk work, fish, poultry birds • Medicinal plants: Neem, tulsi, Penicillium, sarpagandha, cinchona • Disease producing animals: Mosquito, house fly, dog
Class 7, Life Science, Chapter 4	Concept of characteristic features of plant and animals groups: <ul style="list-style-type: none"> • Outline idea of plant and animals groups (mention three identifying characters of each group and cite two examples mentioning scientific names in each group) • Plants: Flowering – Gymnosperm, Angiosperm – (i) monocot (ii) dicot, Non flowering – Algae, Fungi, Bryophyta and Pteridophyta • Animals: Invertebrates – Protozoa, Porifera, Cnidaria, Ctenophora, • Platyhelminthes, Aschel knithes, Annelida, Arthropoda, Mollusca, Echinodermata. • Vertebrates – pisces, Amphibia, Reptilia, Aves and Mammalia
Class 7, Environmental Science, Chapter 2	<ul style="list-style-type: none"> • Response of living beings to changes in environment - adaptation in plants and animals • Modification of environment by human beings to protect themselves against changes and meet their needs • Effect of human activities and population growth on agriculture, harnessing of energy, housing, industrial development and other areas of consumption and social activities (an elementary idea). • Consequences of human activities – stress on land use, water sources, energy and mineral resources; forests, ocean life; environmental degradation • Role of individuals in maintaining peace, harmony and equity nature; good neighbourly behaviour; use and misuse of common property resources
Class 8, Environmental Science, Chapter 1	<ul style="list-style-type: none"> • Ecosystem – interaction between living and non – living components, structure and function; • Energy flow through ecosystem (food – chain, food webs); examples of terrestrial and marine food – chains; • Balance in nature – importance of ecosystem
Class 8, Environmental Science, Chapter 3	Harnessing Resources: Agriculture and animal husbandry – impact on environment

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Cover page of Booklet in Bengali published in this phase of RSG Programme



Report on Project Sharing Workshop 2010



Programme to Conserve the Urban Biodiversity of West Bengal with School Students

*Held at the Seminar Hall, Birla Planetarium, Kolkata
On April 22, 2010*

Organized by



Supported by



Schedule

Time	Activity
10.00 am	Registration
10.30 am	Welcome Address by Ms. Diti Mookherjee, Project Leader and CEO ASED
10.35 am	Inauguration Programme
10.40 am	Address by Chief Guest, Mr. Arijit Banerjee , IFS, Senior Environment Officer, Dept. of Environment, Govt, of West Bengal
10.50am	Address by Special Guest, Dr. S.N. Ghosh , Sr. Research Officer, West Bengal Biodiversity Board, Govt. of West Bengal
11.00 am	Slide Illustrated Talk on “Glimpses of Urban Biodiversity of West Bengal and the ASED Project on Conserving West Bengal’s Urban Biodiversity”. By Mr. Kushal Mookherjee, Member, State Wildlife Advisory Board, West Bengal and Resource Person, ASED
11.15 am	Address by Dr. Ajit Banerjee , EX-IFS and Ex-Senior Forestry Specialist, World Bank. Executive Committee ASED
11.25 am	Project Work Presentation by Schools
1.05pm	Lunch Break
1.45 pm	Project Work Presentations continue
2.05 pm	Interactive Session – Group Discussion & Open Forum on “What we can do together”
2.50 pm	Way Forward & Vote of thanks

Introduction

Another school year has come to a close and with it, students working on their “Biodiversity Projects” have also wound up their work for this phase. It is now time to look back on the year’s activities and evaluate how far objectives have been achieved and chart out the way forward for the coming year.

The project sharing workshop is organized every year as a culmination of the year’s activities. It provides a platform for the various schools under the Programme to share their experiences and learn from each other.

This year 5 out of the 7 schools under the project attended the event. Durgapur T.N. High School sent apologies for their absence.

Welcome Address

Diti Mookherjee, Project Leader and CEO, ASED began the day’s program by welcoming the participants and introducing the special guests. She stressed that one of the main aims of this project was to provide an opportunity for students who love and enjoy nature to find out more about their world and add to their knowledge base.

The three special guests who graced the occasion were *Dr. Ajit Banerjee, Mr. Arijit Banerjee, Senior Environment Officer, Government of West Bengal and Dr. Soumen Ghosh, Senior Research Officer, West Bengal Biodiversity Board, Government of West Bengal* After the welcome address the guests were presented with token gifts by the students.

Inauguration

The programme was inaugurated formally with each participating school contributing to complete a poster entitled “Together We Can”. Each school came up to the podium and stuck a cut-out of a hand to the poster. The cut-outs were marked with the name of the school



Dr. Ajit Banerjee then took the stage and welcomed all the participants. Clarifying that the day's discussions would centre on urban biodiversity, he spoke about effect of agriculture on biodiversity and traced its development from when man practiced shifting agriculture to the introduction of machines and the agricultural revolution. He highlighted how man had eventually realized that clearing forests for cultivation was harmful and how several western countries like Sweden and Canada had incorporated

wooded areas and forests even within their cities.

Unfortunately India has lagged behind in this regard and consequently the richness of its biodiversity has been affected. Dr. Banerjee stressed that there needed to be two areas of focus: first, to preserve the existing biodiversity and second, to find ways to increase it. To illustrate his point he forwarded the example of how there is conclusive proof that Kolkata was once a part of the Sunderbans, whereas now it is far away from the forest.

Address by Chief Guest, Mr. Arijit Banerjee , Sr. Environment Officer, Govt. of West Bengal

Mr. Banerjee urged the participants to take some time out of their busy lives to simply notice their surroundings and thus learn about the biodiversity that surrounds us all every day. He stressed that change was possible only



when good habits were inculcated into daily life and individuals learnt to act every day rather than only on special days designated for the environment.

Mr. Banerjee also encouraged the students to link the subjects they studied in school rather than treated them as isolated topics. In this way they could learn much about their world .He concluded with a wish that all the participants would grow up to be lovers of nature.

Address by Special Guest, Dr. Soumen Ghosh, Sr. Research Officer, West Bengal Biodiversity Board, Govt. of West Bengal

Dr. Ghosh highlighted the importance of action alongside knowledge in the course of preserving biodiversity. It was not enough to know about the biodiversity but also vital to act on that knowledge, he stressed. While looking at the larger issues it is easy to forget that there is much to be done in our immediate surroundings, he pointed out.



Dr. Ghosh commended the students on their projects and encouraged them to view this experience as more than just a classroom exercise. He stressed that no action was too small and even as students their actions could have far reaching effects, as in the case of Sarangabad and the water monitors. There, the students were successful in bring the plight of the water monitors in their area to the attention of the relevant authorities, resulting in appropriate action being taken and the habitat of the water monitors being preserved. Dr. Ghosh urged the students to follow this example and highlight the problems in their particular areas so that they could be brought the attention of the relevant authorities.

Dr. Ghosh also spoke of the role of the Biodiversity Board in preserving the biodiversity. He promised the students the support of the Board in their endeavors and encouraged them to raise their voices to preserve their futures.

Diti Mookherjee concluded the introductory session by urging the students to act if they came across instances of natural habitats being destroyed. She pointed out that it was not necessary to start a revolution....merely bringing the issue to the notice of relevant authorities was often enough.

Slide Illustrated Talk By Mr. Kushal Mookherjee On “Glimpses Of Urban Biodiversity Of West Bengal And The ASED Project On Conserving West Bengal’s Urban Biodiversity.”

Using beautifully shot slides, Mr. Mookherjee highlighted the diverse terrain of West Bengal and the resulting rich biodiversity. He then gave an overview of the project with illustrations from each of the participating schools.

Project Work Presentations by Schools

Moderated by Indrajit Mullick, Field Coordinator, ASED

Bakshara Surendranath Girls High School (BSGHS)



The students of this school had decided to document the biodiversity seen around their locality. The findings were presented by Bipasha Palit and Sangita Dhara.

The girls began their presentation by defining biodiversity. They then spoke of the flora and fauna they had observed, using charts to illustrate their findings. Among plants they had studied several medicinal plants like tulsi, neem, nayantara, etc. Mosquitoes, flies, kingfishers, butterflies, snakes, fish, cats and dogs were some of the animal life they had catalogued. The students also presented a map of their school compound.

During the question-answer session that followed, the girls were asked for scientific names of some of the living things as well as the commonality between mosquitoes, flies and butterflies. Kushal Mookherjee suggested that the students could enhance their study by finding out the exact names of the butterflies and snakes seen by them. He also advised them to think about a project focusing on the Satraganchi Jheel which is close to their school.

Children's Foundation School (CFS)

The presentation of the Children's Foundation School was divided among the students, with each student speaking on one aspect of the topic. Ria Maity, Jayshree Vyas, Rishita Dewan, Gauri Sharma, Shoumasish Halder, Bikramaditya Naskar, Debayan



Mukherjee, Sayantan Das and Rajanya Chakraborty made up the group of presenters.

After introducing the concept of biodiversity and underlining its importance in the present day, the students spoke of some of the biodiversity that can be seen in and around their school. The gradual destruction of biodiversity, its effect in the long run and conservation strategies were some of the other topics the students touched upon. The presentation concluded with an appeal to the audience to join hands in conserving the existing biodiversity.

On prompting by the audience the students specified that their project had involved collecting data from the school neighborhood and studying the various forms of plant and animal life they had come across. They had also grown potted plants in their school.

Dr. Ghosh suggested that the students focus their attention on preserving the plants they have sown and think about cleaning up dirty ponds in their area. It was important to act continuously rather than undertake isolated efforts, he stressed. Diti Mookherjee added that it was important to go beyond collecting data and focus on studying the accumulated information and thinking about ways in which the different species could be protected. Other suggestions from the audience included identification of problems related to the biodiversity of the locality and starting a medicinal herb garden.

Metropolitan Institution (Main)



The presentation was made by Sourav Pramanick, Pabitra Ghosh, Shuken Das, Debnath Das and Saswata Maity.

Using charts and a scrapbook the students demonstrated how they have listed the various life forms in their area and grown some medicinal plants. They had also conducted experiments to study the beneficial nature of trees. One such experiment involved placing thermometers under a tree and under an umbrella and then coming to the conclusion that the temperature under trees is less and therefore that trees have a cooling effect. The students also presented some herbarium sheets that they had prepared in order to study various leaves.

During the Q&A session it was suggested that the students plant more trees, in pots as they were situated on a busy thoroughfare. On hearing that the students face a problem with watering the plants during school holidays, Dr. Banerjee suggested that students who lived nearby could each take a pot home to tend during the holidays. A staff member of the Sarangabad school reminded the student that it was crucial to dig the soil around the plants in addition to watering them. He pointed out that too much watering could be fatal to the plants.

Sarangabad Jyaneshwari Pathshala Girls High School (SJPGHS)

The students from SJPGHS have continued with the project on water monitors which their seniors had initiated. They thus took this opportunity to present an update on the project to the assembled audience. The presentation was made by Purba Chatterjee, Anuradha Mitra and Rinky.



The trio of presenters began by giving an introduction to water monitors, focusing on their nature, diet and habitat. They pointed out some of the threats being faced by this animal with their habitat being taken over by large housing projects. The girls also displayed a chart which illustrated their sightings of water monitors over the last

year in relation to their school compound. The girls spoke of the several field trips that they have made and shared their observations about the water monitors made on these trips.

During the Q&A session the students were asked if they were able to identify individual water monitors by their physical characteristics, to which the girls

replied in the affirmative. Someone suggested that they could then name the individuals which would give them greater identity! Questions were also asked about the value of the animal's skin and whether it had any commercial use. The girls pointed out that the skins of these creatures were often used to make items like bags and decorative pieces.

Ananda Ashram Balika Bidyapeeth

The group from Ananda Ashram began their presentation by stressing on the theme for the day: Together We Can. They spoke of how their united efforts had helped the project grow over the years and made it an integral part of their curriculum, rather than an isolated effort. Sangeeta Chowdhury, Rinika Das, Dola Chakraborty and Sunetra Das presented on behalf of the school.

The school trains their Eco-club members to become peer educators. It also works with several organizations other than ASED, to make the most of their experiences. Interestingly, the biodiversity project has been integrated into the school curriculum and the students no longer run it as an individual project.

With no particular project to present, the students thud chose to speak about their recent visit to the Chintamoni Kar Bird Sanctuary in Narendrapur. Kushal Mookherjee had been their guide on that occasion. The group had consisted of 53 students and 7 teachers. The trip helped to highlight the importance of such spaces in city planning the group stressed.



Following a break for lunch, Ananda Ashram continued their presentation by speaking of some of the small projects that they had undertaken in the past year. One such project helped them understand how the various parts of the environment are linked and how the impact of damage to any aspect of it will have far reaching effects on the other parts. Another project involved studying the school grounds and listing the various life forms that exist there.

A third project was growing and tending a vegetable garden. The group made particular reference to the pumpkin plants with its male and female flowers. The students had observed its growth and also learnt how to prevent it from being destroyed by insects. They expressed regret that their juniors had not been able to keep up

the garden!

The students had also grown a garden of medicinal plants. The garden included plants like tulsi, kalmegh and neem. They also spoke of their efforts to rescue a jamun tree that fell during Cyclone Aila last year. They have tried to restore the tree and have also created awareness among their peers about the importance of looking after it.

There were no particular questions for Ananda Ashram , though a lively discussion ensued when a student from the audience questioned the necessity of killing so many insects to protect one little pumpkin plant!

Interactive Session

The first half of the interactive session was moderated by Sujit Sinha of Swanirbhar. Before initiating the discussion, Mr. Sinha spoke about an evaluation that he and his team were conducting of the project. He explained the aim of the exercise and the process it would follow, stressing the importance of the views of students and teachers involved in the project.

Mr. Sinha kicked off the interactive session by asking the children to narrate any funny incidents or instances where they had been scolded by their teachers in the course of conducting their projects. This broke the ice effectively and soon stories about getting lost in the forest, monkeys creating pandemonium in the school and disgruntled parents were vying with each other for attention!

Another interesting discussion centered on whether water monitors would make good pets. The conclusion was that the animal is too ferocious and intelligent to be tamed.

Mr. Sinha had several suggestions for interesting ways to liven up the school projects. He wondered whether the students could keep a pet in school. Making up and collecting songs about biodiversity, documenting the changes in the immediate surroundings by speaking to elders in the locality and studying how such changes are affecting the entire environment were some of the suggestions that he offered. The students of CFS did their bit by singing a song about the environment.

The second part of the interactive session was conducted by Shubhadyuti of DRCSC. She prompted the students



to speak about their hands-on experience in watching nature in their school compound. Suhadyuti spoke about making artificial nests for birds to lay eggs in and about identifying and tackling energy conservation within the school. She pointed out that most of the schools had spoken about trees and plants which were common and easily found. She suggested that they add to their lists by looking for unusual plants and trying to identify them

Kushal Mookherjee suggested that the best way to identify plants and animals was to take detailed notes while sighting it. Besides a description such notes could include the time and place of sighting. These notes could then be used for identification by consulting the internet, books on the topic or an expert on the subject.

Diti Mookherjee concluded the day's proceedings with a vote of thanks to all the participating schools, students and teachers and guests. She encouraged the schools to be vocal about their views on the project when they met Mr. Sinha during the evaluation.



PROGRAMME TO CONSERVE THE URBAN BIODIVERSITY OF
WEST BENGAL WITH SCHOOL STUDENTS, PHASE II, 2009 – 2010



Certificate of Participation

Certified that Anirban Chatterjee
of METROPOLITAN INSTITUTION (MAIN) *School*
was a member of the Core Group.

30 June, 2010
Date

Diti Mookherjee
Diti Mookherjee
Project Leader



Conserving the Urban Biodiversity of West Bengal through action projects by middle-school students



With the increasing trend of urbanization in the developing world, there is a need to step up efforts to conserve urban biodiversity. Diti Mookherjee and her team from Association for Social and Environmental Development (ASED) are demonstrating how middle school students can be involved in preserving the urban biodiversity of West Bengal, India.

The Project

- 🌿 Core Groups of 25 students of Grade 7/ Grade 8 and 2 teachers trained on biodiversity observation and recording through slide illustrated talk, nature games and booklet, local field trip, visit to a Biodiversity Hotspot.
- 🌿 Core Groups choose a school based project, provided technical and networking inputs by ASED team.
- 🌿 They spread the message of conservation among other students, teachers and community.

- Local plant biodiversity study, planting and/or maintaining a school garden including medicinal plants.
- Awareness among local people.
- 🌿 Networking with schools, Forest Department and NGOs.
- 🌿 Advocacy



Achievements

- 🌿 Presently working with 4 schools in Kolkata, 1 school in Howrah and 2 schools in Durgapur, 700 middle school students trained since 2004.
- 🌿 School projects on:
 - Survey on the status of the endangered Water Monitor (*Varanus salvator*) and campaign to preserve its habitat



Survey conducted by Sarangabad Jajneswari Pathsalja Girl's High School revealed that the habitat of the Water Monitor is under threat from a large private housing project and a Government Sports Complex. This has been brought to the attention of the Department of Environment and a directive has been issued to protect the habitat while conducting the projects.

Challenge

Sustainability of school projects after ASED intervention is over.

