IGBP in Bangladesh in Context of Global Environmental Change

by Dr S D Chaudhuri

THE research related to LOICZ will assess the follow-ing factors and their implication for biochemical cycles and sustainable management of coastal resources.

Research studies may include:

(a) Human abuse of estuarance areas, such as overfishing, oil pollution, entrification etc leading to undestrable impacts on coastal areas. Many of the current studies in the coastal areas are sporadic and scientifically piecemeal. Since many of the coastal changes are interlinked and studies of biotic and interbiotic forms (together with human settlement), this require comprehensive and integrated studies and can be initiated and coordinated by IGBP in Bangladesh.

(b) Sedimentation rate of major rivers in the coastal area;

(c) Salinity levels and their impact on biomass flux particularly in Sundarbans and Esturian.

d) Exotoxicatogy : how does toxic waste products effect marine organics matter? This will require studies on pollution released from urban, agricultural chemicals and industrial action and will require data for predictive purpose.

e) Sea level rise :

Global sea level change is not a new phenomenon but its measurement is far from simple. The difficulties in measuring sea level is that land moves as well. In some areas it is sinking, in other areas it is rising. The major causes are thermal expansion of water in response to warming. Besides polar snow melt since little ice age is contributing also to sea level rise. Once calculation has put the range from 10 cm to 30 cm while others put it from 20 cm to 70 cm rise by 2070.

Rising sea level will have disastrous effect on human settlement and the entire coastal economy. The impact of large dams and other structures on Bangladesh major rivers, regulating water run-off which may lead to dramatic decline in sediment load and will have accelerated rate of change in sea level. It is necessary to study the coast-line stability and its interaction with global sea level change, coastal vegetation etc taking into consideration accelerated episodic storms and floods. LOICS studies will help develop a modelling programme that will be based also on satellite (remote sensing) data, and linked with other coastal projects, to enable National Committee IGBP to develop reasonably accurate prediction for formulation of coastal, management policy by government on scientific basis.

International Global atmospheric and chemistry project

The objective of this project is to determine and understand the process and significance of increasing levels of green-house gases such as Co2, methane (CH3) Nitrons oxide etc in the context of their natural source and sink. The main focus of this project will be measurement of emission of methane from wet land paddy fields. In view of high intensity of rice cultivation in Bangladesh involving some four classes of paddy namely Aus, T, Aman, bradcast deep water Aman and Boro paddy (cultivated throughout the years) it is assumed that Bangladesh wet paddy land is contributing substantial of methane in the atmosphere.

Joint Globe Ocean Flux Study

The objective is to investigate the complex biological and chemical process that regulate the oceanic and transformation of carbon. This project was not tackled by IGBP but it may be done by NOAMI.

The International Geosphere-Biosphere research programme is one of the most ambitious interdisciplinary research effort on global change ever undertaken by scientific community. The causes and consequences of global change are matters of common concern for all humanity and such studies transcend north-south and intra-regional political and geographical divisions. The START concept was initiated with a view to bringing about global interlinking of Regional Research Centres under IGBP with following objectives :

(i) to promote appropriate interdisciplinary studies on a regional basis;

(ii) to help developing countries in improving their analytical skill in global research;

(iii) in training involved scientific personal in developing countries in global research, through practical training under experienced IGBP Scientist in Global Change Research Programme. For example how do regional changes in land use, energy production or industrialisation or urban development alter regional atmosphere composition, regional water resources and local ecosystems structure. How can such changes within a region or in combination with other regions affect bio-geochemical cycles and physical aspects of climate on a global scale. A regional network consisting of regional research centres, research sites are be set up in Asian region and that have already been approved by the Asian scientists. For the present a Regional Research Centre for South East Asia is to be set up in Thailand with research sites to be identified by concerned countries. Such a regional research centre for South Asia may also be formed, if necessary, in future. Such a regional research centre will be extremely useful for Bangladesh which can train up a large number of their scientists in global research and data analyses with assistance from the regional centre.

Biodiversity and genetic resource management

Biological diversity has been eroding at a faster rate in recent years than ever before and the crucible of extinction is believed to be the tropical forests of which a part lies in Bangladesh. Of the approximately 10 million species, that live on earth tropical forestry account for about 50 to 90 per cent. At the current extinction, scientists estimate that 60,000 of wild plant species of the world's 2,40,000 species and even higher proportion of insects and vertebrate will be lost to mankind during the next thirty years. The direct mechanism of species loss include habitat loss, in the introduced species, over-exploitation of living resources, pollution, global climate change and agricultural, industrial and land uses.

In the context of Bangladesh, biodiversity has economic significance in the sense that the country has already lost many of its primeval forests in Chittagong Hill Tracts and Sylhet which were home to some wild relatives of cultivated and economic species and herbal medicines. Illegal felling and mindless exploitation have already taken their heavy tolls. In our future quest to add new qualities to our cultivators on rice, jute etc in terms of disease and drought resistance, to environmental stress, the wild on indigenous cultivated species could have been invaluable. As we go for HYV and standardised varieties, we are losing large number of local varieties which have flexibility of sustainable yield even in adverse conditions. In deep water areas there are over 100 local cultivars many of which have ability to elongate in rising flood water while standard varieties do not been these abilities. Similarly many unexplored new economic species have disappeared. Same applied to appreciated indigenous medicinal plants, the value of which is now being increasingly appreciated. We must make systematic effort to survey all our unknown and known, species and take early steps through survey by botanical and agricultural teams to preserve them intact or at least preserve their geoplasm in gene banks.

Constraints

There are a number of serious constraints from which developing countries particularly least developed countries like Bangladesh suffer.

These are:

1) Lack of effective research infrastructure;

2) Lack of highly trained research scientists particularly in the field of inter-disciplinary areas of envjronment research;

3) Inadequate research equipment and of research, journal on environment;

4) Less opportunity to visit environmental research centres abroad.

5) Lack of encouragement to attend research seminars workshop etc particularly those related to IGBP core project due to shortage of foreign exchange;

6) Absence of government fund for research, particularly in new areas of environmental research.

As far as Bangladesh is concerned the most serious problems that eats up government fund is population control and alleviation of crushing poverty.

International donors like the World Bank environmental facilities, Asian Development Bank, USAID and other agencies could help in supporting environmental research.

(This is the concluding part of a two-part feature.)

Mt Pinatubo's Threat to Last Years

by Abby Tan from Manila

The February eruption of Mt Mayon only further clouds prospects for an environmental recovery in the Philippines, already hit hard by the fallout of Mt Pinatubo. Forest and sea will be affected by tonnes of fallen ash from Pinatubo for years, reports Gemini News Service, making the two-year old disaster far worse than once expected.

THE explosion of the Mt Pinatubo volcano, after having devastated Central Luzon and changed world temperatures, continues to destroy new areas of the Philippines.

Since its massive explosion in June 1991, *lahars* (mudflows) are still a threat to forests, animals and even the coastal marine life on the eastern part of the main Luzon island. And the effects are likely to remain for years, say experts.

"In geological time range, we're speaking of thousands of years," said Edwin Domingo, chief land geologist at the Department of Environment and Natural Resources (DENR). DENR's chief marine geologist. "If you don't dredge now, the lahar goes faster. Either way, corals and marine life will be sacrificed. It is a question of time." The question is whether to help nature accelerate the mudflow or to wait it out.

Mt Pinatubo erupted from a 600-year slumber. Hence, the amount of material spewed has buried Central Luzon in ash, rendering it a wasteland.

To be precise, Mt Pinatubo spewed out two trillion cubic metres of deposits of which less than 30 per cent have been washed down in two rainy seasons hence. Experts expect 10 years for the mudflow to be completely washed down and Central Luzon can be declared stabilised.

Natural Resources Secretary Angel Alcala, a former marine researcher, said reefs produce 20 to 30 tonnes of fish per square kilometre each year. The Bureau of Fisheries and Natural Resources put the economic loss of 8,903 hectares of corals already destroyed at $43 million in lost income to fishermen per year.

Bravo said he was still studying wave currents and conducting off-shore drilling to find out how fast the mudflow is smothering the reefs. Dead reefs are spreading north to Lingayen Gulf, also a rich fishing ground.

Mt Pinatubo has completely changed Central Luzon's geomorphology, its physical landscape, and affected the vegetation and animal life.

"The river systems have changed course, valleys have been filled, lowlands risen and vegetation at lower areas affected," said Domingo, the DENR geologist. "We still don't know what is going to be the final landscape, until it has settled."

Indeed, things are changing every day. Current monitoring has not detected any drastic changes in quantity or quality in the ground water system.

Wildlife sanctuaries in the marshlands of Lingayen may be affected as those in Zambales and Manila Bay are already touched by mudflow.

The forest around the slopes of Mt Pinatubo fortunately seems to have recovered quickly, thanks to heavy rain immediately after the eruption and a strong rainy season a year later, which washed away ash.

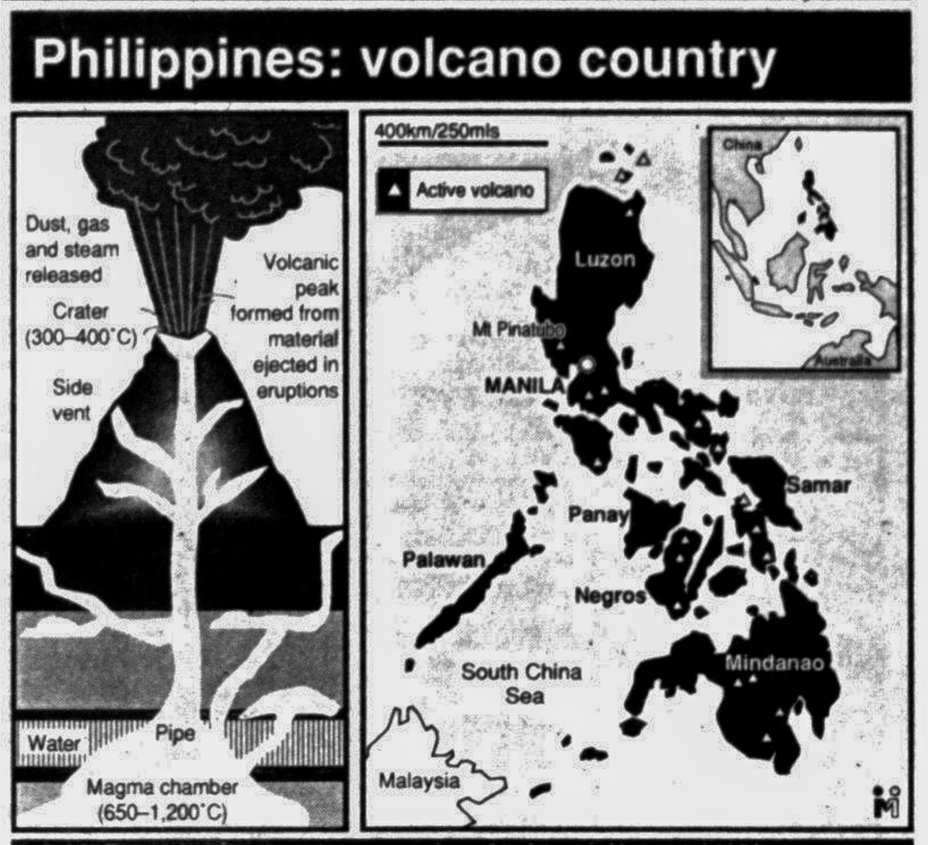
But it is still a no-win situation: The heavy rains were a blessing for the forest's recovery, but they caused thundering mudflows which washed away whole communities, displacing thousands of people.

Also, animals have suffered. The DENR said the number of animals seemed to have shrunk due to a shortage of vegetation for foraging. "Animals are dying on the streets, like deers, boars dogs and birds," said Domingo.

Philippine experts say Mt Pinatubo was more disastrous in environmental damage than the March, 1991 Exxon Valdez oil spill off the shores of Alaska in the United States. That disaster was a single event, whereas mudflow from Mt Pinatubo recurs annually, exacerbating the damage to plants, trees, animals and coral reefs.

Evangeline Gastillo, who heads a team of experts, said five out of 11 species were tested in ash-laden soil and stood out well. This makes the re-greening of Central Luzon possible.

About the Author : ABBY TAN is a Singaporean journalist specialising in economic and political affairs. She has been based in Manila since 1977.



A Sign of Welcome and Luck

It is not only the people of Zaire who are suffering during the current political instability, the continuity of longterm WWF conservation efforts has also been put at risk. One of the projects which has had to be 'frozen' until the situation improves, involves an environmental magazine for children. The latest edition has been prepared, but cannot be printed at present. ***Sandra Mbanefo*** *visited the country just before the riots erupted in late September.*

HEY, reaforestation man, give us Kachech-e! Give us Kacheche!" hundreds of children shouted, running after a WWF education van, in Sake-Kimoka, a village in eastern Zaire.

Kacheche is the name of the African wagtail, a locally protected bird, commonly found in this region. It is recognized as a bringer of luck and welcome.

However, these children were not asking for birds. They were asking for an environmental children's magazine, Kacheche, produced by WWF for secondary school children living near the famous 800,000ha Virunga National Park.

"The Kacheche magazine is distributed around the Virunga National Park and the Kahuzi-Biega National Park, which lies further south," said Jaap Schoorl, WWF Project Executant. "There is plenty of enthusiasm."

Produced annually, Kacheche is financed by WWF and the Deutsche Geseilschaft fur Technische Zusammenarbeit (GTZ). It has a distribution of 70,000, and last year, 2,500 children wrote letters to the editor — some in response to a regional competition.

The magazine's 16-20 pages are filled with colourful illustrations and cartoons. A "Teachers Page" lists possible classroom activities and ideas on integrating Kacheche into the regular school curriculum.

Kacheche is one of many awareness-raising projects in the region. In 1988, for example, WWF established an environmental education project near Sake-Kimoka village. The aims of the programme are to enlighten school children on environmental issues through educational materials, including environmental films and slides shown in local schools. It also organizes field trips into the Virunga National Park — home to some of the world's last remaining mountain gorilla.

In addition, the education project provides seminars to other community groups, encouraging them to establish tree nurseries in an effort to meet their need for wood. This will ease the population pressure on the park's montane forest.

The education van made its way slowly along the bumpy road, and came to a halt at the village football field. Out jumped Mumpfano Kyamenyirwe, a WWF education worker. He grew up not far from Sake-Kimoka, and after teaching in a local primary school for a couple of years, joined WWF's education programme.

Married with three children, this 31-year-old teacher is well known in most of the villages surrounding the southern sector of the Virunga National Park. "We give between two to four film-shows a month", he explained.

"Whenever we arrive at a new place we show a film. That is our introduction."

With the help of colleagues, he set up a 16mm film projector powered by a portable generator. The film screen was stretched above the top of the vehicle, and as they hurried to finish preparations before nightfall, children excitedly jumped around in happy expectation of seeing their first 'moving picture show'.

"I think they are going to tell us about God or something!" one young boy exclaimed, thrilled by all the unusual activity in the village. That night, there were close to 800 people crowded around the projector. As the film "Deforestation and Reafforestation in Africa" began, the crowd cheered their approval. The film was in French, so Mr Kyamenyirwe simultaneously translated the script into Kiswahili, the local language.

He translated with gusto, throwing in a few jokes here and there — much to the crowd's delight. The film lasted over an hour, and provided a colourful introduction to the problems of deforestation and erosion.

Another film which has often been shown is a documentary on mountain gorillas. Last year, close to 54,000 school children were introduced to environmental issues through audio-visual presentations.

The project team has been working with 167 secondary schools, and they have also offered courses for teachers on how to incorporate environmental issues into the curriculum. In addition, awareness-raising with environmental courses and tree planting activities have been an important part of the project.

The last edition of Kacheche focused on tree planting. In 1990, a "Tree Week" was organized in Goma, the largest town bordering the southern sector of Virunga National Park. During that week, close to 3,000 trees were planted in school nurseries. During another campaign, boy scouts planted close to 8,000 trees on Mount Goma.

"The films have allowed people to become interested in things outside their normal sphere of activity," Mr Kambale Musavuli, a secondary school teacher said. "My students did not understand the importance of planting trees. It was through Kacheche that this became clear!" — WWF Features


WWF/Sandra Mbanefo

The children of Sake-Kimoka village in Zaire cluster excitedly round the WWF education van, before the showing of a documentary on deforestation in Africa.

The Kacheche magazine, funded by WWF and the Deutsche Gesellschaft für Technische Zusammenarbeit, aims to raise environmental awareness in school children in Zaire. "Let's plant trees!" said the illustration on the front cover of the last edition which concentrated on tree planting.

Elephant Herds Vanishing

Growing human needs and a smouldering civil war in Sri Lanka is threatening the island's legendary herds of wild elephants ***Nadia Bilbassy*** *reports.*

PEOPLE take their elephants seriously in this ancient capital of the ancient hill kingdom of Kandy.

Kandy's annual elephant festival, called 'Perahera', brings a parade of thousands of caparisoned elephants. For centuries the lumbering beasts have graced Buddhist and Hindu festivals.

The country's most magnificent tusker is given the honour of carrying the sacred tooth relic of the Buddha on an illuminated saddle during the festival so thousands of pilgrims who line the streets can pay their respects.

But the Perehera festival may find it harder and harder in future to get elephants for its parade. Conservationists warn the pachyderms are threatened and their population in the wild has shrunk to a mere 3,000.

"If the government does not act quickly to save them we are going to witness the demise of elephant populations here in the next 40 years," warns Hiran Jayewardene of Fauna International, a conservation group.

Unlike the African elephant, the Asian elephant is smaller, can be domesticated and has smaller tusks. It is not being decimated by ivory poachers, but by growing human populations which threaten the elephants' jungle habitat throughout South and Southeast Asia.

In the mid-1980's about 14,000 hectares of virgin forests which were home to wild elephant herds, were cleared in Sri Lanka's southeast to make way for sugarcane plantations.

The elephants were pushed into patches of forests so small that they were forced to forage for food in surrounding farmlands. An adult elephant needs to eat about 150 kg of vegetation a day.

But in their quest for food, the wild elephants have been invading villages, trampling crops and are being killed.

At least 40 elephants have been killed since March, according to Ranjan Fernando of the Colombo-based Wildlife and Nature Protection Society. Last Month, two more hungry elephants were poisoned by villagers in eastern Sri Lanka.

The government also says elephants are being killed by Tamil Tiger guerillas in the north-east who have been fighting a 10-year-long separatist war. It says the rebels are selling tusks to buy arms.

But conservationists here say the war may actually have been a blessing in disguise for the wild herds. The fighting has prevented human encroachment into the Wilpattu National Park in the north.

Wild herds have also been driven into little patches of jungle in the north-central plains as the government carries out a massive scheme to resettle hundreds of thousands of people from the crowded south to the arid north.

According to Fernando, four national elephant reserves have disappeared in the last decade in the country's dry zone.

Sri Lankan environmentalists are urging the government to save the elephants before it is too late. "Plantation companies should be environmentally friendly, they can no longer show disrespect for the wildlife," says Fernando.

Last year, Sri Lanka's Department of Wildlife Conservation launched what it said was the world's largest translocation programme to shift the wild herds to protected sanctuaries.

The United Nations Development Programme (UNDP) and the Rome-based Food and Agriculture Organisation (FAO) which are helping implement a US$4 million wildlife conservation project that will stretch over five years.

"We want to build up a system of natural corridors for elephants, so they can move around freely," says Malcolm Peer Hijmans, FAO's representative in Colombo.

"We plan to train staff at game parks and on the nature reserves to help create a harmonious existence between villagers and the elephants in the wild," she adds.

Some conservationists like Fernando say the project though well-intentioned has got its priorities wrong. He thinks training wildlife officials abroad will be a waste of money because Sri Lanka has 40 years of experience in managing parks.

"Every country is different in its techniques in dealing with wildlife. For example, we still use the old traditional noosing technique to capture elephants," he says.

But Fernando admits the government needs help from the United Nations to get vehicles and sophisticated tracking equipment to better manage the country's wildlife sanctuaries.