IGBP in Bangladesh in Context of Global Environmental Change

by Dr S D Chaudhuri

INTERNATIONAL Geosphere Biosphere Programme on global change refers to the consequences of any biospheric, geospheric, oceanic or socio-economic process that alter the global environment directly or through the accumulation of local or regional impacts. Changes like deforestation or loss of forest can be measured in months or days while natural variation in the climate system span decades or centuries.

In view of the growing concern for large scale changes in the earth system caused by human and anthropogenic activities, the International Council of Scientific Unions has initiated an International Geosphere-Biosphere Programme (IGBP) which is one of the most ambitious global research programmes up-to-date and is to be conducted by the scientists of the member countries.

The goal of IGBP is to describe and understand the interactive physical, chemical and biological process that regulate the total earth system and unique environment that it provides for life, the changes that are occurring in the system and the manner in which they are influenced by human action.

The total population of the planet is about five billion and the population growth rate had reached nearly one billion per year. The global consumption of energy amounted to 13.1 Terra Watts (one Terra watt=energy produced by one billion tons of coal). People in developed countries consume 7.5 times as much energy as each of the 4.1 billion people who live in developing countries. If current consumption continues, the human population will have consumed the total earth endowments (total fossil fuel and half of petroleum) in the next 20 years.

In order to understand and respond to global change, it requires a knowledgeable public, since difficult political, economic and life-style decisions must be made and accepted particularly by the developed nations. The aim of IGBP research projects, therefore, is to determine how and why the global environment is changing and the risks that are involved and options that are available to respond to these risks. Programme of global change research must draw on natural, medical and biological as well as social sciences.

Why national IGBP is necessary

Without a central integrating and coordinating body, government departments, university researchers and other agencies will simply go their separate ways with environmental global change research. There will be little scope for cooperation but considerable duplication. The result will be that there will be enormous loopholes in the end product.

Although Bangladesh in the context of global geography is a small country, it is located in a most sensitive area from ecological point of view and any global change will have serious impacts on its agro-ecology, flood plains, coastal zones and what is most important, on its human habitat. Its location also makes it vulnerable to regional changes, such as deforestation in the alluvial basin of its three major rivers, Brahmaputra, Ganges, and Meghna, soil erosion, sedimentation rate, water quality etc. Also Himalayan snow-melt change deserves attention. Bangladesh cannot, however, shut itself out from the natural process that is taking place on regional or global scale and must develop and initiate policies and action regionally.

The Bangladesh IGBP programme (studies on global change programme) was initiated in 1987 under the Bangladesh Academy of Sciences and with the encouragement and help of the International Council of Scientific Unions (ICSU) and IGBP Secretariat at Stockholm, Sweden. A national committee of IGBP was set up which was reconstituted in 1990 with representatives from universities, government agencies, semi-government organizations which were working in different aspects related to environment. The committee was reconstituted again in November, 1992 taking into consideration only those research organizations and scientists that are directly involved in environmental research. It took for the national committee 3/4 years to formulate a broad long-term plan on research that is relevant to IGBP core projects which were not finalised by IGBP until 1990. There was no environmental research framework in the country which could incorporate the proposed inter-disciplinary research projects that were supposed to be initiated by the national committee. Apart from a few isolated research undertaken at the initiative of a few scientists, there was no goal-oriented environmental research in the country. The overall aim of the national IGBP committee is to ensure that IGBP research is cohesive, comprehensive and responsive to national needs and international initiatives.

The specific objectives of the national committee of IGBP is to:

— develop a national framework for global change research;

— assist in the formulation of effective policies focused on amelioration of environmental hazards and anticipatory action;

— bring together appropriate research disciplines and organization within the policy sector;

— promote the integration of natural, biological, medical and human aspects to research on global change;

— foster the development of specific research projects;

— stimulate and encourage inter-disciplinary research coordination;

— provide a national information base for IGBP activities and projects ;

— act as the local point for communication and interaction with international IGBP programme and its network.

The national committee does not have any budget of its own to fund research activities except in sponsoring research projects for funding by IGBP or other agencies.

Bangladesh national committee had, after considerable discussion and review of IGBP core projects, decided to take up the following projects if funds are ensured.

Sources	Annual release	Range (Tg CH3)
Natural wet land swamps		
(Haor areas) etc	(TG CH_3)	100-200
Wet land rice paddies	113	25-170
Enteric fermentation in cattle etc	110	65-100
Biomass burning	80	20-80
Termites	40	10-100
Sinks	40	
Removal by soils	30	15-45
Reaction with CH in the atmosphere	500	400-600

Biospheric Aspects of the Hydrological Cycle (BAHC)

Plants and soil affect the fate of rainfall, return of water to the atmosphere and heat budget at the earth's land surface. The BACH project is supposed to quantify the role of terrestrial ecosystem in land, air water fluxes and the hydrological effects of environmental change.

The Bangladesh research project will address these issues through remote sensing studies, vegetation affecting water and energy exchange through evaporation, absorption of solar radiation and carrying moisture from below the ground and thus influence soil structure, and organic matter by the decomposits of plant, organic matter and through soil, fauna and flora. Change in natural vegetation cover in the alluvial basin of the three major rivers flowing through Bangladesh, have significant influence on the water cycle and other component of the climate system. Studies in the Amazon basin indicate that replacement of forest cover by shrub and grass land has increased the surface temperature from 1 to 4^{0C}, and has brought about a change in water run-off with significant effect on the frequency of flooding and water quality. Such a study on regional scale is absolutely necessary by India, Bangladesh, Bhutan, Nepal and China in order to understand the root causes of flooding and the process involved. The study of snow melted in the Himalayan region and deforestation and siltation rate and water quality flux are important areas of studies and must be undertaken jointly by the concerned regional countries.

SAARC can be an excellent forum for initiating such joint studies on the three mighty river systems (the Brahmaputra, the Ganges and the Meghna) which might lead to an understanding of development efforts in controlling flood in the plain with tremendous benefit to millions of people in plain of the region.

It is recommended that regional-scale studies should be simultaneously initiated in order to prepare a base for flood control projects on a sounder scientific basis. Other research projects/studies relevant to BAHC may be considered for implementation provided fund is available.

(i) Transportation of nutrients and organic matters from land and rivers to ocean.

(ii) Quality degradation of fresh water.

Global change and Terrestrial Ecosystem

Studies on the impact of the global change on agriculture and forestry are intended to investigate the effect of changes in atmosphere composition on yield of selected crops. The research studies will include monocropping, rotational and intercropping and will also be focused on some economic crops.

Studies on species' richness on nutrient cycles and other system process of extreme environmental changes (cyclone, floods etc) for the viability of plant species are also necessary.

Other areas/topics that need to be addressed are:

(1) Emission of green-house gases CH_3, Co, Co_2, N_{20} etc.

These studies will be done in collaboration with IGAC researchers.

(2) Impact of human population growth, including development, on environment.

Methane (CH3)

One of the priority topics taken up by the national committee is the measurement of the emission of methane from wet paddy lands. Methane is produced as a result of activity by anocrobio bacteria which unlike their aerobic cousins stop a little short leaving methanes as a major product. Methane is also an important product of the digestion or food by grazing so also in the guts of termites. Methane although in smaller proportion in Co2, plays a greater role in blocking heat from the earth than Co2. It stays in the atmosphere for more than 8 to 10 years before it is broken down.

Fossil fuels are other sources of methane. Incomplete combastion of fossil fuel or biomass adds methaes to the atmosphere.

Quantifying emission from different sources is difficult. Emission of methane from different classes of wet rice fields including irrigated fields and use of fertilizer, different cultivated practices make measurements subject to great variation. Anyway some estimated sources and sinks of methane are as under:

It is necessary for Bangladesh to make systematic efforts to measure methane. N_20 Nitrons Oxide is also a greenhouse gas and its source is rice land but its production depends on fertilizer use, cultural practices and soil type (including breeding of new land).

Global warming have significant impact on crops and insects and thus require attention of our agricultural scientists. Impact studies have indicated that crops will be affected differently in different regions of the world. For instance in the crop region in mid latitude of North America and Europe with no change in precipitation, warming will reduce average yields by as much as 15 per cent with an increase of temperature by 2o C. Ten per cent decrease in north America would be equivalent to 10 per cent decrease in global trade of cereals.

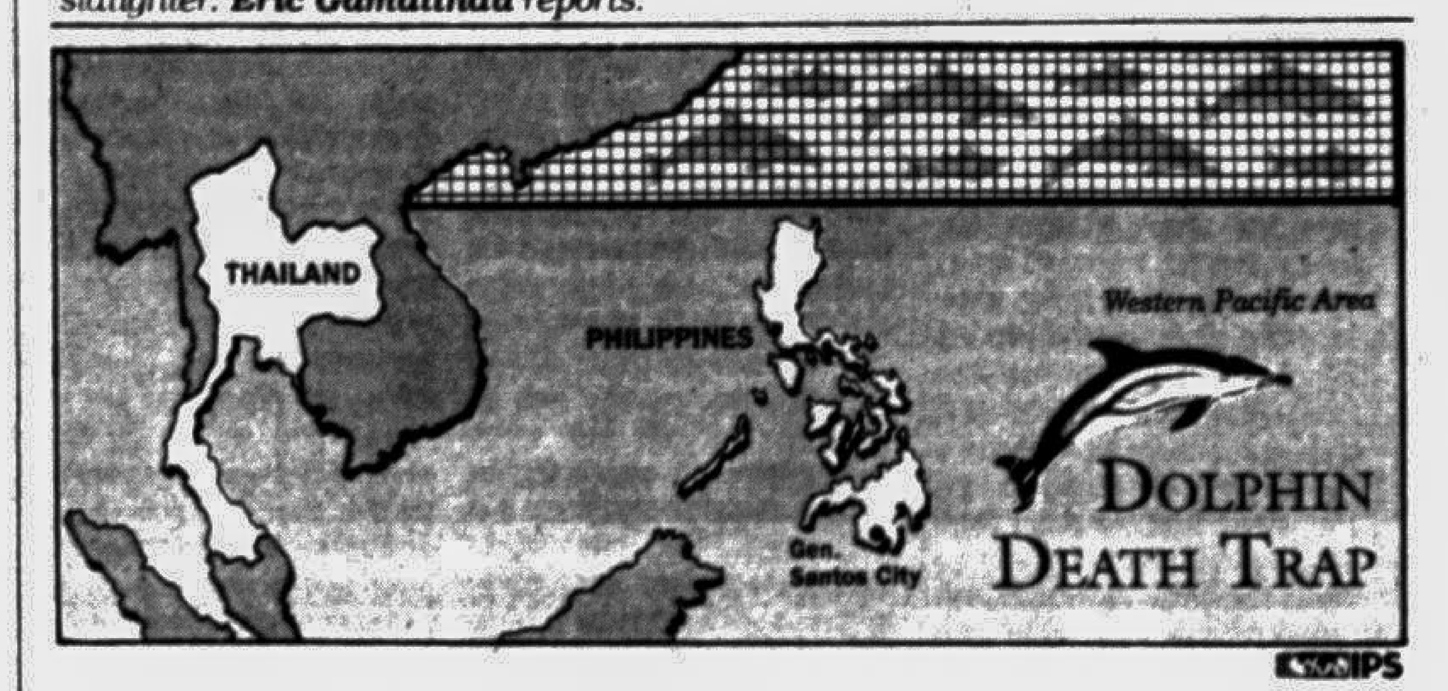
In northern India 0.5c higher temperature may mean 10 per cent lower yield from the wheat harvest. In central India the situation may be worse unless rainfall increases. On the other hand crops might benefit from fertiliser affect of Co2 on summer crops. It is not possible to speculate what would happen in Bangladesh with rise in temperature as no impact studies have been made. Rise in temperature with no increase in rainfall may benefit some areas, while in other region (e.g. tract) the reverse may happen. Pests may be benefited by warmer weather. Our future rice research strategies may take note of the fact that both temperature and rainfall pattern may be changing and they must pay attention to breeding for quick maturing rice for certain areas; for other areas drought resistant rice may be useful. Drought-resistant crops introduced, or indigenous or evolved may be on demand and may be identified. Similarly, irrigation efficiency will assume importance in areas with declining water sources.

(The author is Chairman, National Committee, IGBP)

This is the first part of a two-part feature. For a follow-up see next week's environment page.

Dolphins in the Tuna Death Trap

The country's tuna processing centre becomes a hot spot for rampant dolphin slaughter. ***Eric Gamalinda*** *reports.*



AT the public market, fish vendor Rosemary Portolosa deftly chops the huge chunks of fresh red meat while explaining how to cook it.

"I don't know anything about the law against this," she says as she tears apart what remains of a dolphin, caught off the bay just this morning by local fisherfolk.

Lying along the route between the Western Tropical Pacific Area — the most fertile grounds for yellowfin tuna — and Thailand, General Santos City is Philippines' largest tuna processing centre.

But as efforts to wrench the flourishing tuna market from Thailand become fiercer, this city has also become a hot spot for rampant dolphin slaughter.

Five tuna canneries operate here and two more are expected to open next year. About 98 per cent of the city's tuna produce is exported to the United States and Europe, and some 10 tonnes of sashimi-grade fresh tuna are sent to Japan daily.

Thailand has managed to keep its processing costs low, but the Philippines intends to give it a run for its money by cutting cargo costs by half and setting competitive labour costs.

This area in the southern island of Mindanao is also the site of a massive development project initiated by the Philippine Aid Programme, largely supported by funds from the United States. Its main focus is the region's relentlessly vigorous tuna industry.

But with the philippines lacking laws against dolphin slaughter and the government often having difficulty enforcing environmental regulations, many fear more development may mean more dolphins killed.

For reasons still unknown even to biologists, dolphins swim with schools of big yellowfin tuna. Some experts have recently said, however, that tuna follow dolphins as they search for food.

Some large fishing boats are now equipped with sonar devices to track down tuna, but many marginal fisherfolk who supply most of the canneries here remain dependent on dolphins to lead them to where the fish are.

Neither government agencies nor marine laboratories have estimates of the total dolphin population in the Philippines. But scientists fear rampant killings may soon decimate the country's dolphins, which live an average of only 30 years and can bear only up to 12 offspring in their lifetime.

Most General Santos fisherfolk use cast nets with the aid of the payaw, a raft-like contraption that plunges deep into the water and attracts fish and dolphins, which nibble on the bait. But dolphins are air-breathing mammals and some drown in the process — and wind up being sold as food.

Sometimes, fisherfolk on week-long expeditions also gun down dolphins and eat them. And though dolphin meat has yet to gain popularity here unlike in Japan's Izu Peninusla where it is considered a delicacy, the animals are deliberately hunted for food and bait in various parts of this impoverished country.

But at 1992 study by Silliman University's Marine Laboratory in Dumaguete also blames purse seine fishing where nets that are closed at the bottom surround tuna and dolphins. Experts say the practice has depleted most Philippine fishing grounds.

Recently, a marginal fisherfolks cooperative in General Santos held a meeting in which the leaders urged a stop to dolphin slaughter. Says group head Carmen Grafon: "We are afraid we might become like those places where they have neglected their fishing grounds and are now forced to eat dolphins."

Grafon's efforts are being boosted by the international outcry against dolphin killings, which have made unmonitored tuna catches unpopular among many consumer countries.

Japan has yet to sign an agreement against 'dolphin-unsafe' tuna. But in the United States, pressure from advocacy groups like Earth Island Institute (EII) and the Marine Mammal Fund since 1988 has forced fish suppliers to stop selling tuna caught by driftnets or through tracking down dolphins.

Driftnetting uses extra-long nets that entangle anything in its path, dolphins included. The United Nations had been scheduled to ban commercial driftnets by the end of 1992.

Meanwhile, Puerto Rico, Thailand and Canada have banned "dolphin-unsafe' tuna. The European Community is also under pressure to prevent its becoming a dumping ground for dolphin-caught tuna.

Philippine canneries now need the dolphin-safe seal given by EII and the US commerce department for their products to be allowed in US markets. "In case a supplier cannot guarantee they are dolphin-friendly, we do not buy their catch from them," says Rogelio Espina, plant manager for the Celebes Cannery here.

But tuna boat crewmembers say accidental dolphin catches often happen — and Coast Guard officials do little about them. Adds service vessel captain Manolito Arroyo: "If it's there, we might as well make use of it."

— IPS

Good News for Rainforests

by Suvendrini Kakuchi

PRESSURE from international green groups and an economic slowdown has for the first time reduced Japan's imports of tropical hardwoods from South-east Asia, but environmentalists say it is too early to tell whether this represents a trend.

Japanese log imports from South-east Asia shrank from a record 12.3 million cubic metres in 1989 to 11.3 million 1990, according to the International Timber Trade Organisation (ITTO). The Yokohama-based group estimates another eight per cent drop for 1991.

The international watchdog for tropical rainforests also notes a sharp drop in imports of sawn wood. In 1989, Japan bought close to 1.8 million cubic metres, mainly from the Malaysian states of Sarawak and Sabah. In 1991, the figure dropped to 1.32 million.

"Thailand has taken over from Japan and become the world's biggest importer of sawn wood," says Steve Johnson of ITTO. Among buyers of tropical logs, however, Japan still ranks first.

But despite the encouraging drop in Japan's imports, green groups say their long fight to get the Japanese government to protect tropical rainforests by curbs on demand at home is not yet over.

"Japanese imports are dropping not because the government and corporations want to preserve tropical forests," says Eishi Maesawa of the environmental group Traffic.

Vociferous environmental campaigns against hardwood imports made major dent in Japan's massive import of tropical timber, but conservationists say there are other factors involved.

"The recession in Japan and the drop in supplies from producer countries which realise the need to sustain their forests are the main reasons for the decline we see today," said Yuji Haruna of the non-governmental group Sarawak Campaign.

Japanese demand for cheap tropical timber is blamed for most of the forest loss in the Philippines and Thailand in the 1960's. After decimating a country's forest, big Japanese companies have simply moved on to neighbouring ones to plunder trees.

Currently, they are in the eastern Malaysian state of Sarawak from where Japan gets 53 per cent of its total tropical timber imports. In 1989, Sarawak sent almost half its logs to Japan. Sarawak has cut down production this year by some 1.5 million cubic metres.

Green groups urge Japan to shift from tropical hardwood to environment-friendly softwood timber from plantations in temperate countries. An average Japanese consumes 300 kg of paper each year, while a Chinese or an Indian uses only two kg.

Japan's voracious appetite for tropical timber appears to be declining, raising hopes for South-east Asia's endangered rainforests.

Japan's prodigious demand for paper and plywood, the high cost of domestic production and the availability to cheap hardwoods in South-east Asia are putting a heavy strain on the region's receding rainforests.

Despite the encouraging drop in tropical timber imports, green activists do not discount the possibility of import volumes bouncing back once Japan's economy picks up again.

The Japanese government reduced its housing and construction budget last year. But environmentalists fear plans to spend a trillion yen (US$ 8.3 billion) on public works projects this year mean another spurt in timber imports.

Environmentalists are lobbying for rich countries to formulate a long-term policy to encourage high value, low-volume timber trade.

"We are not asking for a boycott of tropical timber. What we urge the Japanese government to do is to buy valuable tropical wood products for higher prices to reach sustainable forest management," explains Maesawa.

Japan's pledges to protect tropical rainforests, including the much-trumpeted slogan 'Sustainable Management by the Year 2000', have yet to set targets for a higher pricing system or an increase of plywood imports made in developing countries.

In addition to the transfer of technical expertise for better forestry management in Asia, Japan plans to take steps to cut tropical wood wastage at home, including the use of low-cost softwoods like pine for making concrete moulds, a spokesman for Japan's Forestry Agency told IPS.

Increasing higher value tropical wood imports is expected to be an uphill task. The Japan Plywood Manufacturers Association (JPMA) is resisting import increases to protect its interests.

According to ITTO, Japan's consumption of temperate wood, mainly from Canada, New Zealand and the United States, has risen since 1991 to ease the pinch caused by depleting wood stocks.

JPMA plans to increase the use of coniferous plywood in concrete moulds from 10 per cent at present to 30 per cent.

"We are concerned about the vast forest reserves, particularly in the United States, which will become the new targets for Japanese corporations," says Maesawa.

Despite corporate opposition to making fundamental changes in timber trade, ITTO's Johnson says a rise in prices of tropical forest products is inevitable. Producer countries such as Indonesia and Malaysia are trying harder to increase exports of wood products rather than logs or sawn wood.

Indonesia, which banned sawn wood exports in 1988, saw its plywood market grow dramatically from 1.85 million cubic metres in 1988 to 3.05 million in 1989.

Ghanaian Youth Fight Elders for Tress

by Daniel Kondor

Relations between the youth of Jama village in the Bole district of northern Ghana and their elders became strained when they challenged the decisions of the village chief to lease out more than 14 km of forest to charcoal burners.

The village elders condemned the youth as disrespectful, saying they were violating the traditions of this west African country which require the young to accept the decisions of the elders.

For their part, the youth saw the intentions of the chief councils of village elders as being motivated by selfishness and lack of concern for the welfare of the future generation.

"We have been silent on many issues for far too long. In most cases, we could not act because we were not directly responsible for the administration of this village. But this time, when we saw that the future of us young farmers was being jeopardised we decided to act," said Robert Jabi, a technical skills teacher at the local school. "We had to stop the charcoal burners from pushing us into a calamitous end," he said.

Youth of Jama have travelled to the northern parts of the country and have seen the extent of environmental degradation and how it has affected the subsistence economies there.

Ironically, those involved in the charcoal business, Sissala tribesmen, are from the Upper West Region in northern Ghana where, like the Upper East Region, environmental degradation is most pronounced.

"They have finished felling all the trees in their hometowns and now want to turn to other areas. Should we allow them to operate here, we would not find single tree in this place in the next four years," said Kofi Togbe, a cadre of the local Civil Defence Organisation.

They do not want that to happen to their village surrounded by a vast unprotected woodlands and secondary forests spanning more than 148 sq. km.

But for the timely intervention of the youth of the village, a heavy blow would have been dealt to the forests and woodlands of the area. Unknown to the youth, the chief and some elders had collected a good sum of money from the charcoal burners and given them a specific area where they could fell trees for charcoal production.

According to Jabi, by the time a group of the village youth got to the spot where the charcoal burners were felling the trees, more than an estimated three hectares of dense woodlands were stripped bare of trees.

"They caused this havoc in less than four hours. Can you imagine that this work was executed by only eight men? Three of them did the felling with chain-saw machines while the rest gathered the felled pieces in heaps," Jabi recounted, pointing at 17 large heaps of felled, mainly mahogany, trees.

The plunderers said they had paid money to the village chief to get his permission to fell the tees for charcoal production.

The youth came back to the village with the charcoal-burners and through the chief's adviser, who is also responsible for youth affairs, asked the chief to give the charcoal burners' money back to them.

Most of the young people of the village felt betrayed and indignant about the chief's explanation that he needed money for use in the village. Said Peter Kyiu, an adult literacy organiser: "We managed to mobilise funds and gave them to the chief for whatever he so badly needed money to do, to such an extent that he had to allow our forests to be destroyed."

Though not yet an organised environmental group, the youth of Jama are set to protect the environment of their area from all forms of abuse.

They have identified bushfires as one of their major challenges and taken it upon themselves to educate their community on the need to handle fires with care.

Jabi, a carpentry graduate, has taught fellow villagers the importance of certain tree species in the wood-working and construction industries. The youth have also secured some cooperation from the chief on environmental matters. He recently advised local farmers not to farm along rivers and streams, as this causes the waters to dry up.

Their efforts are bearing fruit. More and more villagers have come to understand why their harvests are becoming poorer with each passing year. They are joining in the crusade to protect the forest and the land on which they depend for their livelihood.

— Gemini News