

Cyclone Hazard: A Plea for Danger Reduction Programme -III

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Cyclone Damage Reduction Programme

A reconstruction programme should be designed to satisfy four broad objectives: (a) reduce loss of lives from future cyclones; (b) reduce property and crop damage from future storms; (c) generate employment for residents in the area; and (d) increase the income for residents in the area.

The task that lies ahead relates to the analysis of the nature of hazards in the coastal areas of Bangladesh (and summarize the findings of existing research). The analysis of flood events, particularly the nature and characteristics calls initially for a programme of delimiting major flood areas and providing cyclone hazard information in the form of maps, profiles, charts, tabulations, graphs and narrative description. Accurate surveys should be made which detail not only the economic effects of the disaster — loss of lives and damage to property — but also the morphology of the area induced by the disaster.

Basic research on resource use Vis-a-vis human occupancy in the coastal areas has not been undertaken. We know very little about the resource potentialities and the system of land management. For example, ideas on cooperative farming including zoning and land use regulations have been suggested for the coastal areas, but how for these measures can be applied in a land-hungry country like Bangladesh is anybody's guess. It is imperative before any action is taken that the government specify the broad objectives of the adjustment process for areas subjected to cyclone hazards in Bangladesh.

On the basis of the research into public attitudes new directions are suggested for what could possibly be more effective efforts.

Land use change and control

In view of the peculiar socio-economic characteristics of the coastal area, it would be difficult to relocate the present settlements under normal condition. But empirical evidence suggests that following a disaster, communities, though inherently conservative, are

prepared to accept some changes. Thus, a planned land use, including relocation of settlements keeping in view the extreme hazardous zones, could be given a priori consideration.

These are actually devices which dictate land use and settlement pattern within the hazardous zone and reduce the intensity of damage to a considerable extent. Imposition of building code or land use regulation in particular brings about changes not only in house structure and change in various other detailed devices of construction work but also a change in the existing land use pattern, for example, a shift from the existing crop land use to a belt of afforestation along the coasts, particularly the river banks. All these involve a policy requiring the local administrative body to have absolute control over the land. In this case, these bodies will have to be solely entrusted with the use and utilization of land. These bodies will be required at times to impose restrictions on the use of land through zoning ordinances and other regulations.

Choice of settlement

Instead of the present dispersed pattern the future settlements could be clustered around selected nuclei. The nucleus could be a multi-storied community centre capable of giving shelter to the local residents during cyclonic event. Receiving and disseminating storm warning signals should be among the important functions of the community centres. In normal times the centre should provide educational and recreational facilities to the members of the community.

On the structural side, brick built houses seem to be the favoured adjustments of most coastal residents. However, construction of brick houses of other low cost housing usually requires government subsidy. Houses on piers and community housing should also be encouraged.

Protective works

Though there are obvious bottlenecks in implementing land use regulation because of pressure on the land and

limited economic opportunities, a policy relating to population redistribution as a measure against cyclone damage seemed to have suffered from a bias, a bias towards adjustment that involves large scale engineering construction like protective embankments.

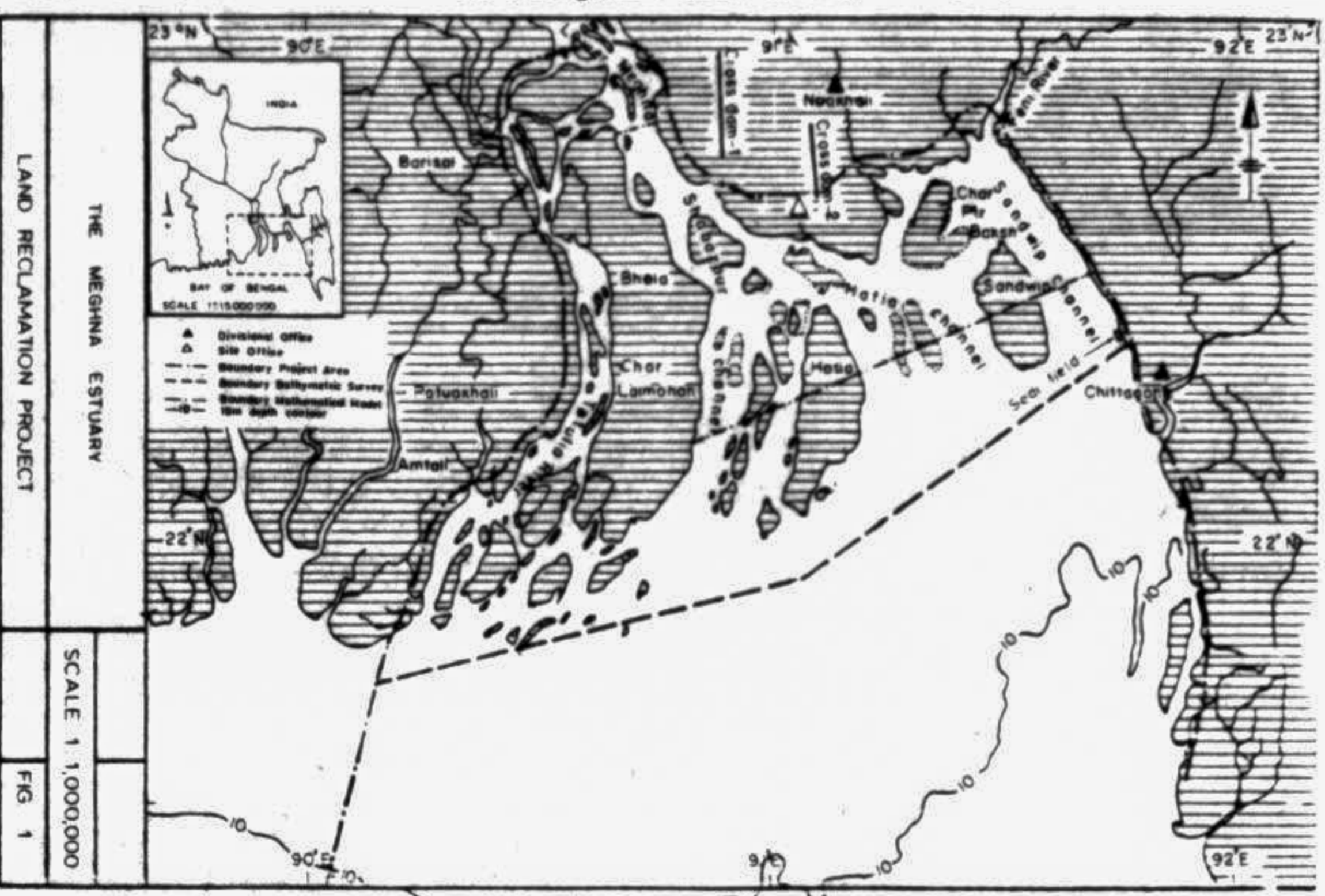
The public choice also seems to have favoured the costly programme on account of the fact that even as they are now designed, the BWDB embankments will provide a much needed shield to the areas ex-

posed to cyclones; in extreme cases they may not impede the tidal waves from flooding the coastal belts but they will certainly substantially mitigate their violence and considerably reduce the extent of the affected areas. It is evident that in certain coastal situation engineering works can be constructed to protect vulnerable areas. It is worth stressing that there are

Afforestation programme

Afforestation as a measure to protect the hazardous coastal belt is needed for serving two important functions: (a) to be able to withstand the onslaught of the cyclonic wind and the associated flooding and (b) to help stabilize the embankment by protecting against erosion taking place along the inward and outward slopes.

Afforestation programme so far has had a limited success; the programme as a whole has



posed to cyclones; in extreme cases they may not impede the tidal waves from flooding the coastal belts but they will certainly substantially mitigate their violence and considerably reduce the extent of the affected areas.

However, protective works, including embankments, are needed to check saline intrusion on croplands. Large scale construction of embankments to buffer against storm surges needs comprehensive review considering the morphology of the coastal area.

Of special need is to evaluate the accuracy of present methods of forecasting cyclones and the associate flooding and the possibility of improving such methods. As the improvement of such methods may depend to a large extent on the availability of accurate meteorological data, research aiming at improvements in meteorological data collection may be encour-

Forecasting and Warning System

Development of extensive public awareness programmes to inform the public about cyclone hazards and illustrate what can be done to prevent a disaster. Educational programmes commensurate with the above to be considered as part of the undertakings are: i) programmes in hazard prone areas; local programmes on implementing cyclone hazard reduction, development of materials in Bangla and workshops and seminars given by experienced practitioners; ii) specific University curricula focused on natural hazard reduction and seminars and workshops focused on actual practice of mitigation measures; iii) personnel training and exchanges, involving practitioner exchange, student intern programmes and locally available graduate student programmes; iv) educational communication (including satellite video programmes) and establishment of education exchange networks.

Educational Programme

Each type of adjustment discussed above, cannot be viewed in isolation from the rest of the programme. One of the most important factors to be considered in evaluating each adjustment is to see their social conformity. Information on the residents' perception and attitude towards the coastal hazard should be assembled so that understanding is reached as to their professed willingness to accept changes in the pattern of behaviour towards the hazard. Environmental fit is another

aged. Further, while accurate forecasting is a prerequisite to effective cyclone warning, how to improve techniques of forecasting flood flow and of forecasting warning time should be another area of research.

An improved road network connecting the coastal areas with the interior should be constructed. This would help in developing a local system of relays to disseminate meteorological forecasts. Above all, there must be provision for quick evaluation of highly vulnerable areas when an extremely severe disaster is predicted.

The ability to warn in local dialects and to communicate accurately the probable threat to life and property with sufficient lead time for action should be the basis for the successful effort in the face of disaster.

Change of Land Holding System

Another important aspect of the plan should be a change in the present system of land holding. Reforms of the prevalent land tenure system should be an integral part of the plan. The government is committed to a social welfare policy; it should persuade the residents of the hazardous areas to adopt a cooperative system of farming in the greater interest of the community.

One promising adjustment, subject to detailed research, is attempting rescheduling of the crop season or the introduction of new varieties of crops in the coastal belt.

criteria to be considered while evaluating any adjustment. Any particular adjustment to be included in the final plan should be within the technological capability of the society.

In essence, the reliance for reduction of damages from coastal hazards will probably have to rest with loss bearing in areas that cannot be protected within economic feasibility, protective works where feasible, adequate warning services, proper building codes, evacuation plans together with emergency relief and guidance with regard to land use change and with the zoning of more hazardous areas. What is required is a comprehensive plan which would be implemented step by step on the basis of priorities set with a view to financial constraints.

Resume

Several general conclusions emerge with respect to the development of a long-term recovery programme by public groups after a disaster:

Before developing detailed plan it is important to understand the economic and geographical effects of the particular disaster. Surveys of the area must be undertaken so that the needs of a reconstruction programme can be fully appreciated.

Specific objectives of a reconstruction programme should be clearly spelled out and a range of theoretical adjustments should be proposed for meeting these goals. A detailed analysis of the costs of each adjustment as well as the benefits (as they relate to the objectives) should be made.

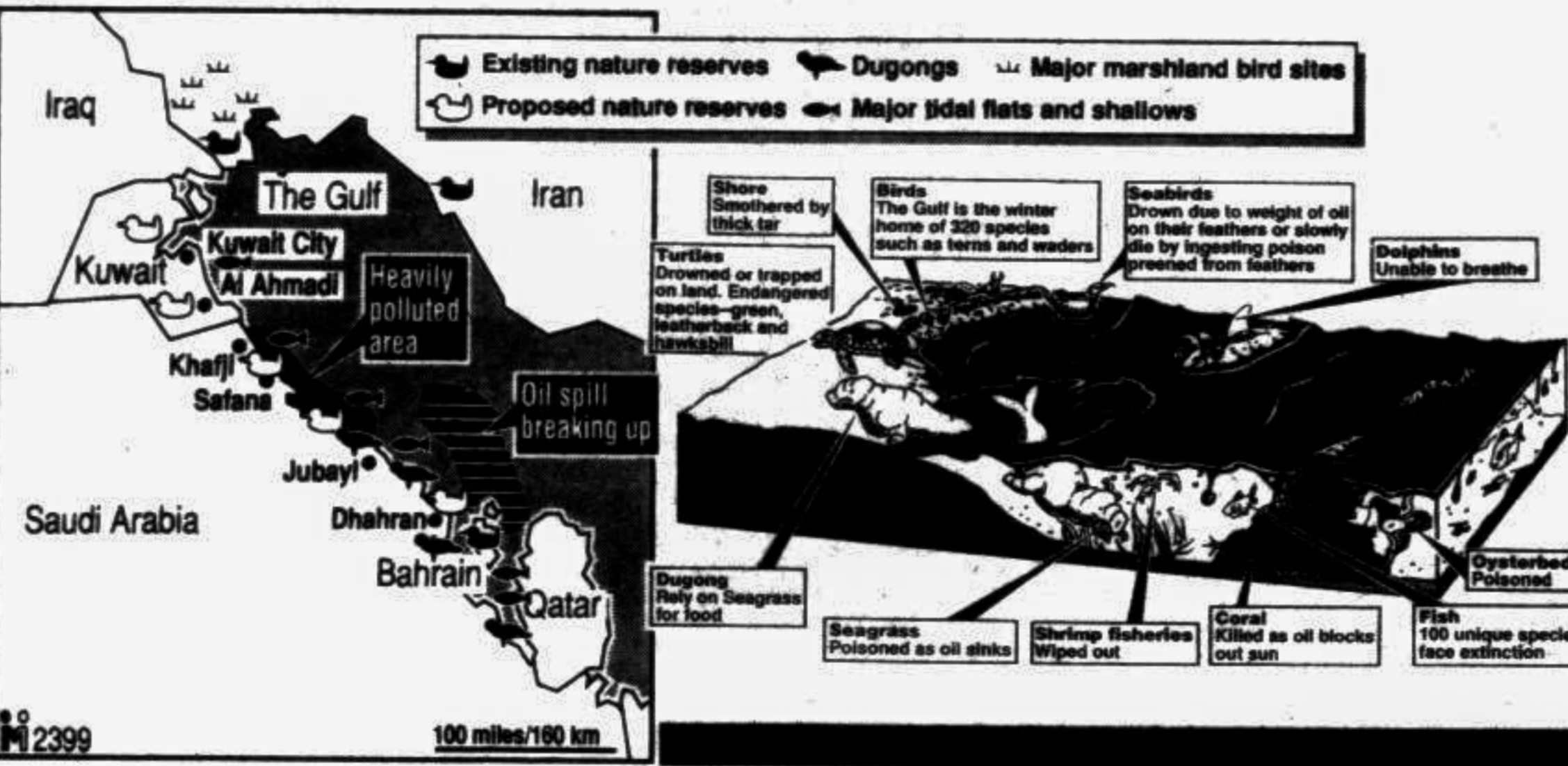
Mechanisms should be designed for ensuring that the final reconstruction programme is actually implemented. Personnel at both the national, regional, as well as local level should be involved in this phase of the operations. Surveys of affected residents, should be undertaken so that their misgivings can be overcome or the plan revised so it more closely conforms with their own feelings.

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ARABIAN COAST NEAR POINT OF NO RETURN

During the Gulf war, Saddam Hussein's forces released huge quantities of oil into the Gulf waters, causing an environmental disaster to equal that occurring on land. There are still three leaks releasing from 500 to 900 cubic metres of oil into the Gulf each day. Environmental groups claim that the international community is not accepting these sorts of consequences of the war. The result, reports Gemini News Service, is that a large area of the Arabian coast may soon be ruined forever.

by Al-Haji A. Tanko



heavy crude has now solidified on the beaches. The area affected is the Saudi Arabian coast, plus all of Bahrain, Qatar and the United Arab Emirates. May of the Gulf's animal-life habitats lie in shallow waters between five and ten metres

of oil pollution and will be destroyed, according to a Greenpeace report.

In addition to the birds which have already perished in the oil, the next wave of deaths is likely to be from starvation as an estimated 2 million migrant birds stop over at the rich feeding grounds, which are now covered in thick black crude oil.

Besides hosting the migrant birds, the northern part of the Gulf contains breeding sites for large numbers of sea-birds including Jounin's Petrel, Audubon's Shearwater, Red-billed Tropic Bird, Masked Booby, Socora Cormorant and Sooty Tern.

The nursing season for birds in the area begins in June, and it is expected that a lot of young birds will not survive the present conditions of smog filled air and oil-filled sea, says Mike Parr of the International Council for Bird Preservation.

A similar fate awaits the fish species which return to the shallow waters for breeding, and also for species such as the Dugong and Green Turtle.

Fishing activity along the coast is currently reduced to about 40 per cent of its level before the Iraqi invasion of August 2, 1990. The less contaminated areas are now overcrowded with trawlers and other fishing boats. Large vessels can operate further out.

The immediate and long-term effects on the health of the people of the region cannot be exaggerated.

—GEMINI NEWS

Asians Honoured with Environment Awards

THIRTEEN Asians are among the world's winners in the 1991 "Global 500" awards given by the United Nations Environment Programme (UNEP). One of them is an agri-fishery village in China and another is a conservation society in Malaysia. Both show that there are many ways to protect and improve the environment.

The prestigious award is given by the UNEP to individuals and groups for outstanding achievements in environment protection.

The awardees from Asia are: Murlidhar "Baba" Devidas Amte of Maharashtra, India; Biplob Bhushan Basu of Calcutta, India; M.K. Ranjitsinh of New Delhi, India; Jun Ut of Tokyo, Japan; Chul-Wan Cha of Seoul, South Korea; Yung-Hee Rho, also of Seoul; Gochoojin Jams of Mongolia; Parvez Hassan of Lahore, Pakistan; Julian Gonsalves of the International Institute of Rural Reconstruction (IIRR) in Silang, Cavite, Philippines; Abu Musa of Damascus, Syria; Seub Nakhasathien of Bangkok, Thailand; Xiao Zhang Zhuang Village in Anhui Province, Yingshang, China; and the Malaysian Nature Society of Selangor, Malaysia.

Thailand and Bangladesh. He assisted in elaborating a cooperative environment programme for South Asian countries and the International Convention on Migratory Species of Wildlife. He was instrumental in planning and funding new national parks and sanctuaries in India.

Dr. Uli, a Japanese chemist, is presently the president of the Asian Environmental Society. He has spent his scientific career documenting pollution and its impact on human beings. He was one of the first scientists to document lead poisoning in Minamata, Japan, and he subsequently supported a movement for the victims. He is campaigning against an airport runway that could destroy a unique coral reef in Okinawa.

Dr. Chul-Wan Cha initiated the promotion of environmental education and preservation in South Korea. His study on public nuisance in Seoul, Pusan and Daegu cities convinced the government to include pollution control in those cities' master plans for economic development. He also founded the Institute for Environmental Health at Korea University.

Dr. Yung-Hee Rho was president of the Korean Planners' Association in 1974 when he laid the academic foundations for the creation of sound human settlements across South Korea. He played a critical role in establishing the graduate school of environmental studies at the Seoul National University, participated in forming the Korea Environmental Preservation Association which tackles the protection of nature and preservation of environmental pollution caused by industrialisation.

Gochoojin Jams has written articles on nature preservation, rational utilisation and reclamation of natural resources. His publications showed that the cultivation of the Eastern Mongolian steppes would lead to soil erosion and loss of biodiversity, hence the area was set aside as a reserve. Mr. Jams' writings have also resulted in the closure of a number of lumber companies and saved 10,000 hectares of woodlands.

Dr. Parvez Hassan, a leading corporate lawyer, has been involved in drafting conservation legislation in Pakistan since

1975. He has prevented contamination of groundwater from untreated tannery wastes in Kasur City, Pakistan. In 1989 he formed the Environmental Protection Society of his country.

Dr. Julian Gonsalves, of the International Institute of Rural Reconstruction, has developed a training and education programme promoting the adoption of environmentally sound methods of food production in the Philippines and other Third World countries. The programme focuses on problems of deforestation, soil erosion, fuel shortages, pesticide management, deterioration of rice ecosystems, loss of genetic resources, and related stress on rural social systems.

Specialists from over 100 government and non-government agencies have been trained to adapt and disseminate these strategies in Asia, Africa and Latin America.

Dr. Ahmad Abu Musa is president of the Ba'ath Pioneer Organisation which aims to promote environmental consciousness among young people in Syria. Its activities include seminars, symposiums, and tree planting projects in camps and schools. "Green Carpet" competitions, exhibitions of plants and flowers, and theatre are also used to convey the message of sustainable development.

The late Seub Nakhasathien had served as forest researcher in wildlife sanctuary and later as chief of Thailand's wildlife rescue projects. He worked hard to rescue drowning wildlife while also fighting illegal poachers. He succeeded in saving 6,000 square kilometres of land from exploitation. Nakhasathien took his own life last September 1 following the shooting and death of two of his rangers by poachers and renewed frustrations he encountered in his struggle to protect the environment.

For 20 years the Xiao Zhang Zhuang village has practiced adopting sustainable agriculture. By developing irrigation and drainage systems and planting trees to reduce soil erosion, villagers have succeeded in raising soil fertility. In addition, they have initiated an aquaculture industry and are using marsh gas instead of domestic fuel. They have reduced population pressure on the environment through a successful family planning programme.

KARACHI — Water has become as precious as oil in arid Pakistan where, despite drilling deep for it, there may soon not be enough for everyone.

Fast running out of surface water, Pakistan has had its scientists draw up a hydrological map of the country to see where underground water lies hidden.

But drilling for groundwater would deplete the precious reservoirs. In the rugged and dry Baluchistan province, deep groundwater tables are said to be receding at one metre a year because geological water deposits are being mined.

Pakistan is getting help from the United Nations Development Programme (UNDP) to assess the technical viability of tapping new surface and groundwater sources for agricultural purposes. The three million dollar project will identify possible deep-well sources to be developed with external financing.

But Pakistani hydrological experts say that even if new sources are found, there has to be more investments in reducing wastage. There has been a proliferation of unlined canals and construction of massive dams

Water as Precious as Oil

such as the controversial Tarbela reservoir. Like the Nile in Egypt, the Indus Valley is historically one of most heavily irrigated areas of the world. But irrigation has brought the resultant danger of salinity.

Evaporating water leave deposits of salt on the soil, harming crops. Groundwater reservoirs are also turning saline, making the water unsuitable for irrigation and drinking.

United Nations experts say about six million hectares of the Indus Valley, one fourth of the total agricultural area, is affected.

Scientists at the World Conservation Union (IUCN) Pakistan chapter say salinisation in the Indus Valley is one of the biggest ecological problems that the country faces.

With help from the UNDP and the Food and Agriculture Organisation (FAO), Pakistan is trying to reclaim some of the

affected land by drainage and pumping fresh groundwater. But the proportion of land reclaimed so far is reportedly negligible.

For a country which depends on agricultural exports for two-thirds of its export earnings, the lack of water can cripple.

Over 70 per cent of Pakistan's 112 million people live in rural areas, and a majority depend on shallow wells and springs for water.

In most areas, groundwater is so salty that it cannot be drunk. The scarcity of clean drinking water also poses a serious health hazard in rural areas where diarrhoeal dehydration is a major killer of children.

According to the United Nations Children's Fund (Unicef), 170 of every 1,000 babies born in Pakistan never live to be five — a figure higher than that of neighbouring India.

Pakistan's population is growing at three per cent a year and is expected to double in 22 years. A 1981 United

Nations study showed that Pakistan had enough water and land to feed 200 million people — but only if existing resources are not wasted.

"It's a race against time. If we don't use water efficiently starting today, we start going downhill," said Sayed Ayub Qutub, of the IUC.

Pakistan's population is expected to reach 400 million by 2035, and Qutub says "there is no way the land can support so many people ... there is no more water".

Qutub has drawn up a plan to make more efficient use of existing surface and underground water sources. The government is also propagating salt-resistant crops in saline areas.

To prevent wastage, Pakistan's new conservation strategy stresses community management of irrigation on the Indus Valley.

Pakistan's Indus Valley civilisation flourished 5,000 years ago but suddenly vanished because of desertification and other environmental calamities. Experts warn that if something is not done soon, history could very well repeat itself.