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USAID BANGLADESH

MISSION DISASTER PREPAREDNESS PLAN

UNITED STATES AGENCY FOR INTERNATIONAL DEVELOPMENT

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GLOSSARY

General:

AID/W	Agency for International Development, Washington
AMB	U.S. Ambassador to Bangladesh
BDG	Bangladesh Government
CO	USAID Grants and Contracts Officer
CONT	USAID Controller
DAT	Disaster Assistance Team
DAMU	Disaster Assistance Monitoring Unit
DIT	Disaster Information Team
MGMT	USAID Management Officer
MDRO	USAID Mission Disaster Relief Officer
NGO	Non-Governmental Organization
NGOL	USAID NGO Liaison Officer
OEE	USAID Office of Economics and Enterprise
OFDA	AID Office of Foreign Disaster Assistance
OPH	USAID Office of Population and Health
PRO	USAID Program Office
PDE	USAID Project Development and Engineering Office
PVO	Private Voluntary Organization
RLA	USAID Regional Legal Advisor
USAID/B	U.S. Agency for International Development, Bangladesh

Non-Governmental Organizations:

ADAB	Association of Development Agencies of Bangladesh
BAVS	Bangladesh Association for Voluntary Sterilization
BRAC	Bangladesh Rural Advancement Council
CARE	Cooperating Agencies for Relief Everywhere
CRWRC	Christian Reformed World Relief Committee
FPAB	Family Planning Association of Bangladesh
FPPIA	Family Planning International Association
HKI	Helen Keller International
ICDDR/B	International Center for Diarrhoeal Disease Research/Bangladesh
IVS	International Voluntary Service
PF	Pathfinder Fund
PRIP	Private Rural Initiatives Project
RDRS	Rangpur Dinajpur Rural Service
SCF-US	Save the Children Federation, U.S.
TAF	The Asia Foundation
WVB	World Vision Bangladesh

Governmental Organizations:

MET	Meteorological Department
SPARRSO	Space Research and Remote Sensing Organization
MOR	Ministry of Relief
CPP	Cyclone Preparedness Program

I. INTRODUCTION

Bangladesh lies at the southeastern foot of the Himalayan Mountain range. The country is the formation of the delta of three great rivers, the Ganga, the Brahmaputra and the Meghna. The Bay of Bengal forms the southern coast of the nation. The riverine environment shapes the daily life of the country; agriculture and aquaculture are the dominant features of the economy, and the basic diet of the people is dependent on abundant sources of water and the fauna and flora within.

A riverine environment brings with it the perennial threat of floods. Not a year goes by when some part of the delta does not experience flooding to some degree and the area of potential flooding in Bangladesh is staggering; as much as two-thirds of the land's surface has been covered at a single time. As many as 50 million people were said to have been directly affected by the flooding of 1988.

The weather of Bangladesh consists of two major seasons, the hot and humid summer monsoons and the cool, dry winter. As the winds shift from north to south in the fall and from south to north in the spring, the country experiences violent wind storms. During October and November depressions form over the Bay of Bengal and create cyclones which move to the north crossing Bangladesh. If these cyclones strike the coast at high tide they drive before them tidal bores which roll in for miles inundating low-lying islands and coastal areas. The spring brings the threat of "northwesters", thunderstorms with high winds and heavy rain. A frequent sight for the spring traveler are "dust devils" twisting across the landscape. These whirlwinds occasionally gather in strength and create extremely destructive tornados. Highly destructive earthquakes and civil strife--less common but highly destructive disasters--always loom as a possibility.

While geography certainly plays a role, Bangladesh's true vulnerability to disaster arises out of the interlocking phenomena of overpopulation, environmental degradation, and severe poverty. These ongoing conditions exacerbate the impact of the geophysical events, leading to sharp increases in child mortality and morbidity, as well as economic deprivation for those living in or near the poverty line. It is fair to say that Bangladesh, even when the weather is fair, is in a constant state of disaster. This fact has shaped this Mission's thinking on disasters, as we see disaster preparedness and relief as an extension of development, and development as the best preparation for withstanding disasters.

Mission Disaster Assistance Strategy

As the population of Bangladesh and the level of industrialization expands, the impact of these natural disasters, in both human and financial terms, will increase. Following the floods of 1987 and 1988, the Government of Bangladesh, the donors, and the NGOs recognize that development in Bangladesh must include preparedness for the recurring disasters.

Although the Mission can and should offer certain types of immediate emergency assistance, the greatest contribution to disaster alleviation in Bangladesh is through ongoing developmental activities. Although some lives are lost as a direct consequence of any natural disaster in Bangladesh, the threat of widespread deprivation and death as a consequence of natural disasters is due to lost wages and poverty. The strategy, therefore, of the Mission disaster preparedness, relief and rehabilitation plan is to lessen the impact which disasters have on economic growth and the quality of life by mainstreaming disaster assistance to the extent possible into health, population, food security, and private sector growth strategies.

To address this concern, the Mission supports a variety of disaster preparedness activities within the BDG, international organizations and NGOs. The long-term goal is to develop adequate technical and logistical capacity within these organizations so that U.S. Government assistance can be distributed with minimal involvement by U.S. Government employees.

In disaster relief, we have found from repeated experience that our ongoing programs in food security and child survival, combined with a system of health and nutritional surveillance and rapid assessment, are our best responses to major disasters. The extraordinarily low death toll in the 1988 floods (estimated at 2,000 people out of a total of 30-40 million flooded out of their homes) was due in large part to the availability of food in country and the market and non-market mechanisms to distribute it. Our Title II and Title III food security programs have carefully developed these mechanisms. Likewise, our longstanding support in diarrheal disease control played a vital role in averting deaths as a result of knowledge about and availability of ORS. We have begun to establish an NGO network for nutritional surveillance and food aid targeting, and have put in place a fast acting mechanism to channel OFDA disaster relief through reliable NGOs. Our disaster preparedness plan is devoted to improving access to these resources, and making them more effective in a post-disaster situation so as to reduce the economic and physical hardship occasioned by the disaster event.

Mission Disaster Response

USAID/Bangladesh's policy and procedures for reporting on disasters and for financing and monitoring emergency and short-term rehabilitation assistance in the event of a disaster is detailed in Manual Order No.300-5 (Appendix D).

In order for disaster assistance to be made available by the Office of Foreign Disaster Assistance, a formal disaster determination must be made by the Chief of Mission (i.e., U.S. Ambassador or Charge d'Affairs). In making such a determination, the Chief of Mission must determine that the following conditions are met:

1. that an act of nature or of man has disrupted social and economic life;
2. that it is beyond the ability of the host government to respond adequately;
3. that it is in the interest of the U.S. Government to provide assistance.

The determination may be made on the basis of an Action Memorandum from the USAID Mission Director. The Action Memorandum shall be prepared by the MDRO on the findings of the Disaster Information Team and the recommendation of the Disaster Assistance Team.

Upon the determination of disaster by the Chief of Mission, the Disaster Assistance Team shall initiate a six step procedure for disaster assessment and assistance. The steps are as follows:

1. assessment of damages and/or deprivation, based upon reports of the DIT;
2. selection of activities which the US Mission will implement;
3. procurement of resources required for disaster assistance program;
4. provision of disaster assistance to BDG, international organizations, and/or NGOs;
5. monitoring of grantees' disaster assistance programs through the use of contracted personnel and the DAMU;
6. evaluation of disaster assistance program and revision of Mission's disaster assistance plan.

The extent and nature of the U.S. Government's response to any disaster will be dependent upon the nature and extent of the situation. However, based upon previous experience and knowledge of the Mission's technical and logistical abilities the Mission has established an overall strategy which will guide the selection of activities.

By the same token, we are consciously avoiding areas where other donors or organizations may have a comparative advantage, such as housing and curative medicine. Recognizing our organizational limitations, we will not attempt functions which can be better managed at the level of the NGOs or the BDG, such as logistical management of relief supplies. Our role is to provide support for these entities, as they in turn, support the communities affected.

The objectives of the Mission strategy in time of disaster are:

1. to minimize the increase in malnutrition as a result of the disaster;
2. to minimize morbidity and mortality from diarrheal and infectious diseases which occur or increase as a result of the disaster;
3. to enhance the capacity of the economy to recover from disasters;
4. to improve understanding of the effects of disasters and various forms of disaster assistance on long-term development.

Organizational and Managerial Principles of Disaster Response

1. USAID/Dhaka as lead agency in formulating a USG response -- Previous experience in Bangladesh and other settings strongly supports a decentralized approach to formulating a disaster response. In areas of the world where AID has little or no field representation, the coordination role is left to the US Embassy, OFDA, or another agency of the USG. In the case of Bangladesh however, USAID/Dhaka is the arm of the USG best situated to select those actions and resources which can be efficiently delivered and are of highest priority.

In Bangladesh, communities, the NGOs, and the government have considerable experience in responding to floods, cyclones, tornados and droughts. Formal and informal systems exist permitting local needs to be identified in the communities and channeled upwards to USAID and other donors. Insofar as existing resources prove inadequate, USAID will request additional support from OFDA and ANE, while coordinating its response with other donors.

2. Cash as preferable to commodities -- The disaster preparedness literature and the experience of the organizations which provide relief strongly support the use of cash (for the purchase of local supplies and payment of wages) as opposed to the importation of a wide variety of goods and equipment. Cash permits maximum flexibility and efficiency in responding to changing and unknown situations. It promotes economic recovery, which is the central problem of disaster relief and rehabilitation in Bangladesh. Finally, it lends itself more readily to adequate control and subsequent audit.

3. Limited number of commodities -- Besides cash, the Mission has found that it is capable of coordinating the delivery of Title II food using existing infrastructure. It also can use the expertise and infrastructure of the Title III program to advise the BDG on food pricing and rationing policies.

The Mission's capability to supply Oral Rehydration Solution (ORS), and Water Purification Tablets (WPT) is limited by supply limitations even during normal periods. Nevertheless, these items are of very high priority in post-flood situations. The Mission has also found use for certain varieties of seeds, some of which can be imported.

Therefore, the Mission will restrict its commodity requests to those which it can efficiently procure, distribute, and account for. These are generally food aid, ORS, WPT, and seeds.

4. Impact upon regular projects--In the event of a disaster, all offices can be expected to contribute time and expertise as needed, including that of contractors and grantees. Nevertheless, the Mission will make every effort to recruit additional contract staff, paid out of disaster resources, and return permanent staff to regular programming activities as soon as possible.
5. Limit disaster grants through reliable, private channels The Mission, as a first step toward redrafting its disaster plan, has recently produced a Disaster Procedural Guide which sets out rigorous procedures for "pre-qualifying" non-governmental organizations as principal recipients of cash grants and commodities. To date, USAID has pre-qualified 13 NGOs which have a demonstrated capability to manage and account for resources. The Mission will concentrate most disaster grants through a limited number of these pre-qualified NGOs.
6. Central Coordination -- The Mission has three mechanisms for the coordination of information and action. (The structure and function of these mechanisms are described in greater detail in the following section.):

- a. The Disaster Information Team (DIT): a technical group composed of Mission specialists capable of rapid disaster assessment.

- b. The Disaster Assistance Team (DAT), comprised of USAID Office Directors (and other officers as required) which uses the information assembled by the DIT to advise the Mission Director and Ambassador on relief strategy and ensure the implementation of their decisions.

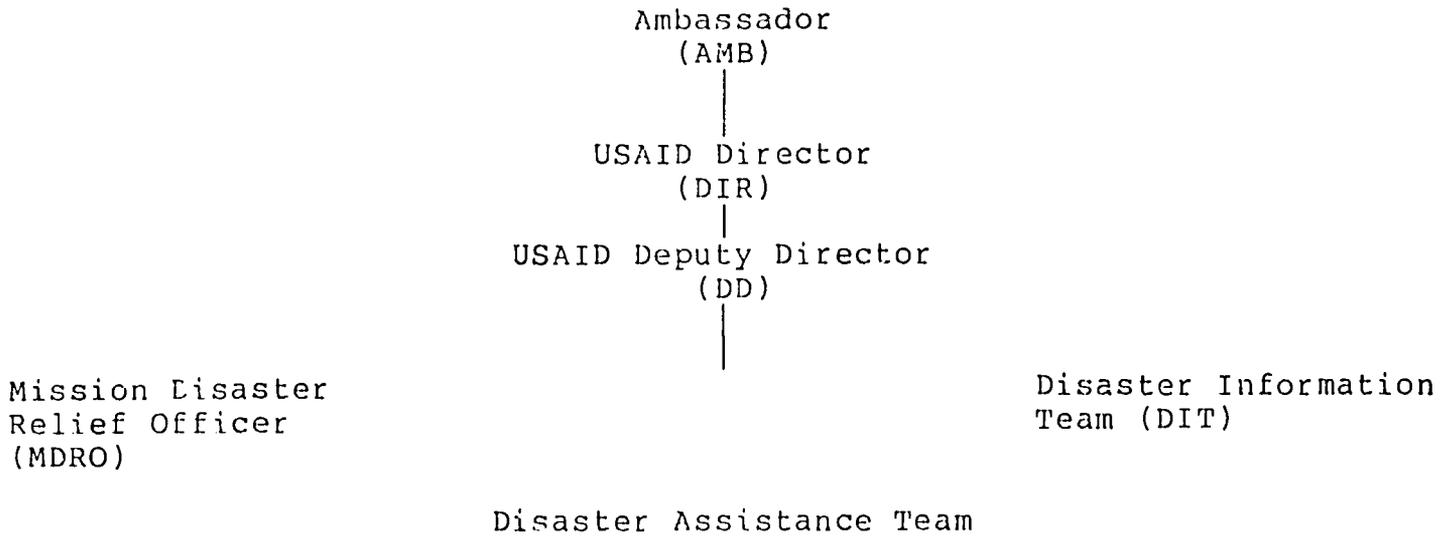
- c. The Mission Disaster Relief Officer (MDRO): a USDH who acts as chair of the DIT and secretary of the DAT. The MDRO organizes the assessment, presents its findings to the DAT, and coordinates implementation.

The nature of most disasters in Bangladesh and the overlapping responsibilities among the Mission's offices require close internal cooperation. For example, food aid responsibility is shared between OFA and PDE, while nutritional surveillance data is supplied by OPH. Food price data and wages must be shared between OFA and OEE, to be used in targeting food aid (OFA and PDE). Physical damage estimates are supplied by PDE (for infrastructure) and OEE (for industrial and other economic assets). All PSCs must be technically backstopped by the relevant technical office, and administratively backstopped by the MDRO working with MGMT, and the Contract Officer. Grants must be selected on technical recommendations, then managed by the MDRO, with input by the Contract Officer, Controller, and the RLA. This is the reason for the committee structure.

The need for rapid assessment is met by the Disaster Information Team, while the need for agile implementation is met through the MDRO, NGO pre-qualification, and additional support from PSCs.

7. Timely and Adequate Information Diffusion and Communication -- The Mission, through the central coordination mechanisms listed above, will be responsible for rapid assessment of potential and actual disaster situations, and for maintaining close communications with OFDA, ANE, the Embassy (especially the Ambassador, the PAO, and relevant office heads), and other donors.

II. MISSION DISASTER RESPONSE ORGANIZATION



Program (PRO)	Management (MGMT)	Controller (CONT)	Reg. Legal Adv. (RLA)	Cont./Grants (CO)
Health C/S (OPH)	Economics Enterprise (OEE)	Engineering & Title II (PD&E)	Food & Agriculture (OFA)	NGO Liaison (NGOL)

Disaster Assistance Procedures

Procedures to be followed for declaring, and reporting on disasters and implementing OFDA-funded projects are outlined in Mission Manual Order 300-5.

What follows in this section is the organizational structure for assessing disasters, formulating strategies, and implementing relief and short-term rehabilitation.

Mission Disaster Assistance Team (DAT)

The Disaster Assistance Team is comprised of USAID Office Directors and other officers as required. It is responsible for advising the USAID Director and the Ambassador regarding when and what types of assistance are required during periods of disaster. The DAT will review disaster-related information provided by the Disaster Information Team (see below), recommend the Ambassador's declaration of a disaster when appropriate, evaluate requests for disaster assistance and approve disaster assistance activities. Following a declared disaster, the DAT is responsible for reviewing the "Lessons Learned" and, if necessary, revising the Mission's goals and procedures for disaster assistance. The DAT is responsible for determining that the activities of the Mission during disasters are in accordance with the goals of the Mission and meet USG regulations.

The DAT is chaired by the Mission Director (or Deputy Director, at the Director's request) and will normally consist of the:

- Mission Disaster Relief Officer (MDRO)
- Mission NGO Liaison Officer
- Program Officer
- Controller
- Contracts and Grants Officer
- Regional Legal Advisor
- Management Officer
- Directors of OPH, PDE, OFA, and OEE, or their designees.

Additional members may be appointed by the Director depending on the scope of the disaster and the nature of assistance.

Deputy Director

At the request of the Mission Director the Deputy Director can serve as the chairman of the Disaster Assistance Team. S/He is responsible for coordination of the Mission's disaster response and liaison with other departments within the U.S. Mission to Bangladesh. The Deputy Director will be responsible for supervising the type of information which is given out by the Mission regarding the emergency situation and the actions which the Mission is taking. The Mission Director, at his or her discretion, may wish to assume direct responsibility for some or all of these functions.

Mission Disaster Relief Officer

Prior to Disaster:

The Mission Disaster Relief Officer is responsible for insuring that all Mission disaster preparedness procedures, policies and Manual Orders are kept up-to-date. At the request of the Deputy Director, the MDRO will serve as chair of the Mission's Disaster Information Team which is responsible for collecting information regarding potential and current natural disasters in Bangladesh. S/He is responsible for providing situation reports to DAT members and to AID/W when necessary. During flood season, the MDRO shall coordinate with technical staff and the relevant BDG offices to produce regular rainfall reports, indicating abnormal rainfall patterns (See Appendix E, Weather Alerts and Reporting).

The MDRO is responsible for keeping the Mission informed of the disaster preparedness and flood control activities of other donors and agencies.

During Disaster:

Following the declaration of a disaster the MDRO will serve as a locus of responsibility for all activities which the DAT elects to initiate. When OFDA funds are available, the MDRO, with the approval of the DAT, will recruit one or more PSCs to assist as needed. The MDRO is the administrative backstop for OFDA-funded PSCs.

When possible, NGOs or other organizations will be provided with a single disaster assistance grant. These grants will include cash and/or commodities. Although technical offices will be responsible for technical monitoring of relevant portions of a grant, the MDRO will be expected to coordinate implementation, monitoring, and evaluation of grants.

The MDRO will serve as a clearinghouse for all information coming into the Mission and will write situation reports and action request cables to OFDA. S/he will coordinate and exchange information with technical offices, contractors, grantees, other donors, NGOs, and the BDG.

Post Disaster:

The MDRO is responsible for writing a "lessons learned" paper. This document is for internal use only and discusses actions taken and provides recommendations for future disasters. Following review and approval by the DAT this paper will be maintained on file in the office of the MDRO. The MDRO also compiles a final report listing types of assistance provided and dollar values. This report will be cleared by the DAT and be filed with the MDRO; a copy is provided to Director's Office for inclusion in briefing materials.

NGO Liaison Officer

The NGO Liaison Officer is responsible for liaison with all NGOs in consultation with relevant technical offices. S/he is responsible for maintaining an updated list of NGOs which are pre-qualified to receive disaster assistance grants, for collecting situation information from NGOs and reporting on NGOs' disaster relief activities and coordinating the review of NGOs' request of disaster assistance grants.

Program Officer

The Program Officer will advise the DAT on management of OFDA funds as well as other sources of funding. S/he will also be on the DAT to assist in the integration of disaster activities and ongoing development programs.

Regional Legal Advisor

The Regional Legal Advisor will provide the DAT with assistance regarding the legal implications of any activities which DAT members are considering. It will be his/her responsibility to clear on all Action Memoranda and Disaster Assistance Grant Agreements.

Contracting and Grants Officer

As the responsible officer for preparation of all Mission contracts and grants, the Contracting and Grants Officer will advise the DAT regarding any difficulties which s/he foresees in preparation and execution of disaster grant agreements and contracts.

Controller

The Office of the Controller is responsible for the disbursement of all cash grants and payment of contracts. The Controller is also responsible for the review of financial and accounting systems of NGOs to determine whether they are adequate. The Financial Review division is responsible for review of NGO cash and commodity grants. The Controller will advise the DAT regarding types of assistance and organizations to be provided with grants.

As described in Manual Order 300-5, the Controller will establish and appoint members to a Disaster Assistance Monitoring Unit (DAMU) to review the monitoring capacity of proposed intermediaries and to assist project officers in their development and implementation of plans for monitoring disaster assistance activities.

Management Officer

The Management Office will be responsible for providing logistical support to the MDRO during disasters. The Management Officer will arrange transportation and housing for any TA which is requested by the Mission and/or sent by OFDA. S/he will assist in the clearance of commodities and will assist in providing temporary storage space for a limited number of commodities.

Technical Offices

The Offices of Project Development and Engineering, Food and Agriculture, Population and Health, and Economics and Enterprise will be represented by their respective Directors, or their designees. These representatives will make technical recommendations to the Mission Director and the MDRO, participate in the decisions of the DAT, and will be responsible for implementing the disaster responses described in Section 1.5 below, based upon information provided by the Disaster Information Team and decisions of the DAT.

Disaster Information Team (DIT)

The Disaster Information Team is a technical group composed of Mission specialists capable of rapid disaster assessment. It can include both USDH and FSN staff. It is chaired by the Mission Deputy Director or, at the request of the Deputy Director, by the MDRO. The role of the DIT is to collect, analyze, and disseminate, within the Mission, information regarding potential and current natural disasters, and present these to the DAT. The members of the DIT will include--besides the MDRO--designees from the Offices of Population and Health, Project Development and Engineering, Economics and Enterprise, and Food and Agriculture.

The current list of DIT members is attached in Appendix B. It is the ongoing responsibility of the MDRO to update this list in coordination with the Directors of the technical offices.

The Mission Director or Deputy Director will call the DIT into operation if a disaster situation occurs or appears imminent, and will return each member to his regular functions when the services of that person are no longer required for disaster purposes.

III. SECTORAL RESPONSE PLANS

A. Office of Food and Agriculture Response

While the direct threat posed by extreme wind and flood conditions may be serious, it is the loss of employment and income in the wake of natural disasters which poses the greatest threat in Bangladesh. Hundreds of thousands of Bangladeshis are dependent upon wages earned as daily agricultural laborers to purchase food. Crop loss in the wake of disasters may reduce such employment opportunities and leave daily laborers and their families without income. Although food may be available in the market at a reasonable price, the level of malnutrition, especially among women and children, will increase as a result of a lack of cash.

During disasters the Office of Food and Agriculture will have four major responsibilities:

1. Using sources at its disposal, collect information on the status of the agricultural sector and provide this information to the DIT.
2. Make recommendations to the Disaster Assistance Team regarding the type and extent of agriculture and food activities in which the Mission should be involved.
3. Assist in the review of requests for assistance.
4. Implement approved agriculture and food activities. The MDRO will be responsible for coordination of the overall relief effort to be implemented through the technical offices.

The Director of the Office of Food and Agriculture will serve or will designate one member of his or her staff to serve as the regular representative to the Disaster Assistance Team. During periods of disaster the Director of OFA will assign other staff members as needed to complete the Office's responsibilities.

Food and Agricultural Sector Disaster Response Goals

Within the Mission the Office of Food and Agriculture is responsible for assessing the situation within the agricultural and food sectors, recommending actions to the Disaster Assistance Team and implementing approved agriculture and food activities. The goals of the Mission and the Office of Food and Agriculture are:

1. To enhance the agricultural sector's capacity to recover from disasters;
2. To support the Ministry of Food's abilities to respond to a disaster effectively, thereby minimizing increases in malnutrition which result from disasters;

3. To monitor and support where appropriate the performance of the Public Food Distribution System during the disaster period;
4. To improve understanding of the effects of disasters and various forms of disaster assistance on long-term development of the sector.

Assessment of Food and Agricultural Sector

The Office of Food and Agriculture carries out regular assessments of crops and other related activities. Depending upon the time of the disaster within the agricultural cycle, the Office would rely upon its normal assessment or carry out additional field surveys in disaster-affected regions.

The Office of Food and Agriculture will rely on three other sources of information during periods of disaster: 1) a representative of the Office will sit on the Food Donors Group to obtain information regarding in-country food stocks, activities by other donors and the BDG, and food targeting; 2) the Office will also coordinate with the Office of Population and Health to insure that the health and nutritional information provided by Helen Keller International is used in targeting food aid, and 3) The Office will also coordinate with the Office of Project Development and Engineering, and through it, CARE which is the current cooperating sponsor for Title II food aid in Bangladesh.

The Office of Food and Agriculture will provide updated information to the Mission through its DIT representative.

Proposed Disaster Relief Activities

The size and scope of the response will depend upon the extent of damage in the agricultural sector and the availability of resources. Based upon its assessment of the situation OFA would propose some or all of the following activities:

1. The provision of technical assistance to the BDG, donors, and NGOs in the following areas:
 - a) food supply assessment;
 - b) agricultural production assessment;
2. Provision of emergency food assistance under the Title III program;
3. Provision of agricultural inputs, eg., seeds, fertilizers etc.

Response Requirements

1. Technical Assistance. The Mission has a wealth of expertise within its own staff. There are also a number of expatriate and Bangladeshi researchers and specialists who could be called for assistance in the event of an extended disaster situation. A maximum of 2 external consultants might be useful:

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- a) a food assessment specialist; and
- b) an agricultural production specialist.

OFDA-funded consultants will work under the technical guidance of OFA, with administrative support from the MDRO.

Prior experience has shown that an excess of consultants and/or inexperienced consultants will create a burden on Mission staff and have a negative effect on meaningfully responding to the disaster. In case of a disaster, the Mission should advise OFDA immediately regarding number and type of TA personnel required. The Mission should request that OFDA, to the extent possible, fax CVs and information on possible consultants to the Mission for concurrence.

Commodities

1. Food Aid -- As in previous years, the Mission's Title III program will help ensure that the Ministry of Food maintains adequate but not excessive food stocks in order to preclude the possibility of famine during the wake a natural disasters.
2. Agricultural Inputs -- Obtaining locally adapted seed is difficult. Importing and distributing inputs on a timely basis will be a major challenge. AHE/TR/ARD and OFDA have been very useful in the past in identifying possible international sources.

B. Office of Population and Health Disaster Response

In addition to the direct threat to life which natural disasters present, disasters in Bangladesh exert a negative effect on the already poor health status of the population, especially women and children, through:

a decrease in food availability (short-term as a direct result of the disaster and long-term due to crop loss and economic losses which reduces employment) causing increased malnutrition and hence increased risk of death from all causes, and

increased contamination of food and drinking water, overcrowding and poor sanitation, resulting in a large increase in the prevalent diarrheal and infectious diseases.

Health Sector Disaster Response Goals

Within the Mission, the Office of Population and Health is responsible for assessing the health sector situation, recommending actions to the the Mission, and implementing approved health sector activities as delegated by the Mission Disaster Relief Officer (responsible for overall coordination of Mission disaster activities). The goals of the Mission and the Office of Population and Health are:

1. to minimize disaster-related increases in malnutrition;
2. to minimize morbidity and mortality due to disaster-related diarrheal diseases;
3. to minimize disaster-related morbidity and mortality due to increase in endemic infectious diseases.

Assessment of Health Sector

The Office of Population and Health is continuously collecting data on the status of health in Bangladesh. The health/nutritional surveillance project implemented by Helen Keller International (388-0083) provides baseline data for the most disaster-prone areas of the country, and will continue data collection at an accelerated frequency during and after disasters to provide rapid feedback on the impact of the disaster and disaster assistance. Several other existing OPH projects have the capacity to generate baseline and/or post-disaster health/nutrition data for specific parts of the country, eg., the Urban Volunteers Program (urban slums of Dhaka), and the MCH-FP Extension Project (three rural sites). In addition to established channels of information there would be a continuous interaction with UNICEF, the ICDDR/B Cholera Hospital, NGOs and other donors.

OPH will collect and synthesize all available information and provide a technical analysis of the situation through its representative on the DIT, along with recommendations for Mission intervention in the sector.

Proposed Disaster Relief Activities

The size and scope of the response will depend upon the magnitude of the health threat and availability of resources. Based upon its assessment of the situation OPH would propose some or all of the following activities.

1. Provision of technical assistance to the BDG, donors and NGOs in:
 - nutritional/health surveillance;
 - water and sanitation;
 - targeting of food aid.
2. Provision of ORS and/or Water Purification Tablets to large NGOs with proven distribution channels and documented accountability. Experience has shown that commodity aid through procurement is not an area in which USAID has a comparative advantage due to our comparatively complex procurement and quality control regulations. However, ORS and Water Purification Tablets are of such importance, and access for the non-governmental sector so difficult during disasters, that USAID should consider procuring these through OFDA. Other major donors in the health sector (eg., UNICEF, WHO) are positioned to provide ample commodity assistance to the BDG.
3. Provision of cash grants to support NGOs in the delivery of emergency health services and related logistical costs (e.g. transport and storage of supplies).

Response Requirements

1. Technical Assistance. The Mission has a wealth of expertise with its own staff. Through ICDDR,B and other organizations there are a number of researchers and specialists in endemic diseases. A maximum of three external consultants may be necessary for extended technical assistance requirements. OFDA-funded health consultants will work under the technical supervision of OPH, with administrative support from the MDRO. Possible technical assistance needs include:
 - a. One senior epidemiologist with extensive LDC and disaster experience to work for 4-12 weeks with the BDG Ministry of Health. Since Ministry of Health and possibly Presidential concurrence is required OFDA should not recruit such an individual prior to a request from the Mission;
 - b. One nutritionist/nutritional epidemiologist with extensive experience in food aid and food policy;
 - c. One water and sanitation expert with prior LDC disaster experience.

Prior experience has shown that an excess of consultants and/or inexperienced consultants will create a burden on Mission staff and have a negative effect on disaster response. In the case of a disaster, the Mission should advise OFDA immediately regarding number and type of TA required. The Mission should request that OFDA, to the extent possible, send CVs and information on possible consultants to Mission for concurrence.

2. Commodities. Under normal conditions local production of ORS can barely keep pace with demand. Although efforts are being made to increase local production, it is not realistic to expect that local production will exceed normal demand and provide for creation of buffer stocks in the foreseeable future. In the past the BDG has requisitioned all ORS available in-country during times of disaster, thereby leaving no stocks for NGOs and private retailers to draw upon. As long as USAID's stockpile of OPS and WPT remains in Dhaka (expiration date of current stock is 1991) this can be used to supply NGOs. Experience in 1988 indicated that source procurement of ORS and WPT requires approximately six months to deliver in Dhaka. If USAID and OFDA are to be able to assist in the delivery of these essential commodities OFDA must maintain adequate stockpiles either in-country or in the region. A regional stockpile must contain 500 cc sachets of ORS, the size used in Bangladesh but rarely used in other countries.
3. Cash grants - OFDA cash grants will be provided to selected NGOs to offset the costs associated with increased patient caseload, emergency feeding, storage and distribution of relief supplies, and other related costs.
4. Support Services - Depending on the magnitude of the disaster and relief response there may be a need for OFDA funded short-term local PSCs to assist in field monitoring and related paperwork. Such support is critical in minimizing disruption of the Mission's development program.

Duties within the Office of Population and Health

During disasters the Office of Population and Health will have four major responsibilities:

1. Through its surveillance systems and its representative on the DIT, collect information on situation in the health sector;
2. Make recommendations to the DAT regarding type and extent of activities in which the Mission should be involved;
3. Assist in the review of requests of assistance;

4. Implement approved activities, as delegated by the Mission Disaster Relief Officer. The MDRO will be responsible for coordination of the overall relief effort implemented by the various technical offices.

The Director of the Office of Population and Health will serve or will designate one member of his or her staff to serve as the regular member of the Disaster Assistance Team. During periods of disaster the Director of OPH will assign other staff members as needed to complete the Office's responsibilities.

C. Office of Project Development and Engineering Response

During disasters the Office of Project Development and Engineering will have three major responsibilities:

1. Provide the Mission with current information on the state of the infrastructure, particularly roads, railroads, electricity/power, waterways and communications;
2. Using food production information supplied by OFA and nutritional surveillance data produced by OPH and Helen Keller International, coordinate with the MDRO and CARE to assure the efficient distribution of Title II food to identified target populations;
3. Provide the services of the Mission's disaster and food for peace specialist, in the provision of meteorological and other data to the Disaster Information Team.

The Director of the Office Of Project Development and Engineering will serve or will designate one member of his staff to serve as the regular member of the Disaster Assistance Team. During periods of disaster the Director of PD&E will assign other staff members as needed to complete the Office's duties.

Infrastructure Sector Disaster Response Goals

Natural disasters in Bangladesh frequently result in significant damage to the nation's infrastructure. Roads and rail lines are covered by water, bridges are washed away, electric power services are disrupted, telephone and telegraph service is worsened, and water and sewer services are threatened. As the nation continues to industrialize and grow the potential for significant infrastructural damage increases.

Within the Mission the Office of Project Development and Engineering is responsible for providing assessments of damages to infrastructure and assisting in review of requests for assistance. The goal of the Mission is to maintain updated information regarding the state of communication, transportation and public services which are disaster-affected.

Assessment of Infrastructure Sector

The Office of Project Development and Engineering will coordinate with and use information from EDG, other donors and NGOs to assess the national situation. If the situation is localized or the Office believes it appropriate, Office staff will be sent to the disaster site.

Proposed Disaster Relief Activities--Infrastructure

1. Provision of short-term technical assistance to the BDG, donors and NGOs in the following areas:
 - water and sanitation;
 - electric power in rural areas;
 - the installation of bailey bridges for temporary use and repair of rural and feeder roads, if not provided by other donors.

Projected Response Requirements--Infrastructure:

1. Technical Assistance. If extended technical assistance is required in water and sanitation, the Mission will attempt to contract an expatriate consultant with LDC experience, or obtain locally-available technical assistance. Mission staff and local contractors and grantees will be available for consultation insofar as necessary. OFDA-funded consultants would work under the technical guidance of PDE, with administrative support from the MDRO.
2. Support Service. Depending on the magnitude of the disaster there may be a need for OFDA-funded PSCs to assist in the assessment of damages to infrastructure. Mission-funded institutional contractors may fill short-term needs.
3. Equipment. No equipment should be provided without consultation with the Mission and previous testing in an LDC.

C. Office of Economics and Enterprise Response

One of the most important steps toward disaster rehabilitation is economic reactivation. As infrastructure is damaged and electric power services are disrupted, public and private enterprises may suspend work, lay off employees, or close altogether. Damage to the agriculture sector will produce additional downward pressure on wages. As the nation continues to industrialize and grow the potential for significant industrial damage increases. Past experience indicates that the loss of wages and employment was the greatest source of distress in post-disaster situations.

During disasters the Office of Economics and Enterprise will have three responsibilities, taking into account the severe limitations of reliable data, as well as time and staff constraints:

1. Provide the Mission with the best available information on the current state of the industrial and other productive assets;
2. Estimate damages and costs for rehabilitation;
3. Assess the impact of disasters on employment and incomes;
4. Make recommendations on appropriate policies for rapid economic recovery.

The Director of the Office Of Economics and Enterprise will serve or will designate one member of his staff to serve as the regular member of the Disaster Assistance Team, and another member to the Disaster Information Team.

Private Sector Disaster Response Goal

Within the Mission the Office of Economics and Enterprise is responsible for providing assessments of damages to productive enterprises and assisting in review of requests for assistance. The goal of the OEE is to obtain available information regarding the state of the industrial and commercial sectors which are disaster-affected.

Assessment of the Economic Situation

The Office of Economics and Enterprise will coordinate with and use information from PDG, other donors and the private sector to assess the national situation. If the situation is localized or the Office believes it appropriate, staff will be sent to disaster sites.

Given the in-country capabilities of the World Bank, the IMF, and research institutions, it is not likely that outside consultants will need to be hired. Should the Mission desire to contract local consultants to carry out surveys of affected areas, OEE may be asked to provide guidance in data collection and analysis.

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IV. DISASTER PREPAREDNESS ASSISTANCE: BANGLADESH

A. Bangladesh Government Disaster Organization

The Ministry of Relief (MOR) is the permanent disaster relief organization in Bangladesh. It is responsible for the coordination of all Government of Bangladesh activities related to disaster relief, as well as those of the international and voluntary agencies and bilateral donors. The BDG disaster organization consists of four tiers, from the national to the union level. The organization at the union, upazila, and district levels consists of officers of various government service departments and civil administrators at each level. Union and upazila level officials are responsible for assessing relief needs and mobilizing and overseeing relief efforts immediately after the disaster.

The MOR operates an emergency operations center located in Dhaka. The radio network connects the operations center with district and upazila headquarters throughout Bangladesh. This network, normally used for administrative purposes, doubles as a warning alert system.

Although all relief activities by the Bangladesh Government are conducted according to the "Standing Orders for Flood, 1984" or "Standing Orders for Cyclone, 1986", experience has shown that even during times of relatively minor disasters the Bangladesh Army is called in by the President. According to the Orders, "The Secretary of the Ministry of Relief shall be the Superior Executive Officer in case of any emergency relief operations and in that capacity, he will exercise full control over all civil officers . . ." The involvement of the military and the President undermines the authority of MOR and makes coordination more difficult between the BDG, NGOs, and donors. Nevertheless, the military is credited with carrying out a relatively efficient relief operation during the 1988 floods, and it is likely that it will be called out in future disasters.

B. Meteorological Services and Warning Systems

The Bangladesh Meteorological Department is the principal source for information on weather conditions. Through a network of 35 stations around the country, it records and transmits data on rainfall and wind conditions daily. It issues 24 hour forecasts every four hours, 7-10 day forecasts, and a one month forecast on the second working day of each month. It is important to maintain contact with the MET Dept. between the months of April and November, as it issues cyclone and northwester warnings, rainfall predictions, and rainfall reports. The Bangladesh Water Development Board (BWDB), in addition to the MET Dept., maintains 300 rainfall data platforms, of which 40 have telegraphic contact with Dhaka. The Flood Forecasting and Warning Division of BWDB also issues

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a daily report on the river situation and forecast for the next 24 hours. Our flood reporting cable is prepared based on the information provided in this report.

SPARRSO is the BDG unit responsible for gathering satellite images. It has the capacity to track cyclones, estimate damage to crops within hours of a flood or cyclone, and analyze rainfall data. Besides its access to weather satellites, it collects rainfall data from 10 platforms. SPARRSO computers can create images of the country as a whole or a particular district.

An additional source of weather information is the Fleet Weather Center (FLENUMOCEANCEN) in Guam, which occasionally cables storm/cyclone warnings to the Embassy. This information, when received, is shared with the MET and SPARRSO.

The Storm Warning Center issues a set of warning messages down to the upazila levels. Authorities in these areas are responsible for publicizing the Danger or Great Danger warning throughout the region by use of bullhorns, sirens and other means at their disposal. Special bulletins are regularly broadcast by all of the stations of Radio Bangladesh. The broadcast are repeated hourly, half-hourly, or at shorter intervals depending on the situation. River ports are warned for the safety of river craft using inland water ways. Warnings are given by radio and flag signals.

In cooperation with the Storm Warning Center, the Bangladesh Red Crescent operates a Cyclone Preparedness Program. From a headquarters in Dhaka, officials maintain contact with 20,000 volunteers stationed in districts within the cyclone belt. Officials supervise the volunteer warning system, the training of volunteers, maintenance of all equipment and various off-season development projects. Each upazila is divided into village units of trained volunteers. These units are responsible for warning, first aid, evacuation, reporting and shelter. Their equipment consists of megaphones, transistor radios, mechanical sirens, and first-aid kits. The central staging areas at Barisal and Chittagong have speedboats, jeeps, motorcycles, and LCT (Landing Craft with Tracks).

The Red Crescent is building and operating cyclone preparedness centers located in the cyclone belt. Centers vary in the degree of preparedness and supplies in stock. The Red Crescent operates 65 local Red Cross Units and central warehouses where relief supplies are stockpiled.

C. Non-Governmental Organizations in Bangladesh

Non-Governmental Organizations are playing an increasingly important role in disaster relief and community-based preparedness. During the 1988 flood, USAID channeled nearly all of its relief commodities and cash through a small number

of international and national NGOs, most of which were registered with USAID or AID/W as private voluntary organizations (PVOs), and are experienced in managing USAID or centrally-funded grants.

USAID has therefore recently designed and approved a Disaster Procedural Guide (USAID Manual Order No. 300-6, 12/26/89) which provides a detailed procedure for "pre-qualifying" relief channels, approving or disapproving their requests under emergency conditions, and considering requests by other organizations.

Presently, the Mission has pre-qualified 13 NGOs for either cash, commodities, or both:

NGO	Cash	Health Commodities	Non-health Commodities	Region
BRAC	No	No	Yes	nationwide
BAVS	Yes	Yes	No	nationwide
CARE-Bangladesh	Yes	Yes	Yes	nationwide
Caritas-Bangladesh	No	Yes	Yes	nationwide
CRWRC	No	No	Yes	Jamalpur Bogra, Joypurhat
FPAB	Yes	Yes	No	nationwide
FPIA	Yes	Yes	No	nationwide*
ICDDR, B	Yes	Yes	Yes	Dhaka, Matlab Upazilla**
IVS-Bangladesh	No	No	Yes	nationwide*
RDRS	Yes	Yes	Yes	Rangpur-Dinajpur region
SCF-USA	Yes	Yes	Yes	Manikganj Chittagong, Tangail, B. Baria
TAF	Yes	Yes	No	nationwide*
World Vision	Yes	No	Yes	Mymensingh Chittagong, Bogra Khulna Faridpur

*works through sub-grantees

**ICDDR/B also has mobile teams to dispatch to rural areas at BDG request

ADAB

In addition to these, ADAB (Association of Development Agencies of Bangladesh) is the apex organization of NGOs in Bangladesh. Most NGOs registered with the BDG to receive foreign donations are members of ADAB. ADAB played an important role in coordinating the work of relief in the 1989 Manikganj Tornado, and could possibly be called upon to play a coordinating role in future disasters. With support from USAID's PRIP project, ADAB is supporting preparedness training for NGO professionals, and is promoting community-based preparedness strategies.

D. Surveillance Systems

The Mission now has access to two important surveillance systems. As mentioned earlier, Helen Keller International (HKI), working through NGOs and with the BDG, is establishing a nutritional surveillance system designed to identify high risk children. Baseline data will facilitate comparisons over time and across regions. While this system has a mission beyond disaster preparedness, it permits a better targeting of food aid and other forms of relief. At present, 7 NGOs are participating in 16 upazilas and 4 urban areas. This number is expected to expand over time.

The ICDDR/B Urban Volunteers Program has designed a Flood Surveillance System to monitor epidemiologic data on sampled families in Dhaka relief camps and bustee (slum) areas. This system will consist of 5 part-time interviewers, 3 nutritional assessment staff persons, a research supervisor, and a statistician, and the Director of the Urban Volunteers Project. Unlike the HKI system, which is an ongoing nationwide effort with non-disaster uses, it will be mobilized only in the event of floods in Dhaka.

ICDDR/B has ongoing demographic surveillance which includes data on births, deaths, and migrations in three rural sites in Bangladesh, two of which (Matlab Upazilla in Chandpur District and Sirajganj Upazilla in Sirajganj District) are in disaster-prone areas.

DISASTER HISTORY DISASTER VULNERABILITY

COUNTRY PROFILE

Bangladesh lies in the north eastern part of South Asia between 20 degree 34' and 26 degree 38' north latitude and 88 degree 01' and 92 degree 41' east longitude. The country is bounded by India (West Bengal and Assam) on the west and the north, by India (Tripura and Assam) and Burma on the east, and by the bay of Bengal on the South.

Bangladesh has a population of 110 million with an area of approximately 144,000 square kilometers. The intercensus population growth rate is estimated by using adjusted population of both 1974 and 1981 censuses was 2.32 per annum. The density of population is about 800 per sq. km. Agriculture is the main occupation of the people of Bangladesh which directly contributes around 46% to the GDP.

OVERVIEW OF SOCIAL AND PHYSICAL ENVIRONMENT

Bangladesh is a low lying riverine country, located over a major seismic fault. It is primarily a flat alluvial plain crisscrossed by the mighty Padma, Meghna, and Jamuna rivers and their many tributaries. Flood plain areas occupy about 80% of the landscape. Ecological deterioration attributable to progressive deforestation in the upstream of the major rivers in India and Nepal may lead to an increased frequency of sheet flooding in Bangladesh, although this was not apparently the case in the 1988 flood.

Bangladesh is one of the poorest and most overpopulated countries in the world. It is estimated that almost half of its population is landless or near landless (living on less than 1 acre of land), and nearly all of that is living below poverty. Riverbank erosion and accretion have accelerated the process of landlessness. An estimated 80% of Bangladeshi children suffer from various grades of malnutrition. Under normal circumstances, Bangladesh produces only half of the ORS needed to maintain an Oral Rehydration Therapy (ORT) rate of 30% for children under 5.

In a disaster situation, those living near the poverty line can easily slip below it, as they are forced to sell what remaining land they have. Those who depend upon wage labor for subsistence are forced to compete with those entering the labor market, which becomes further depressed by the loss of harvests and damage to sources of employment. Even when food is available, the landless poor often cannot purchase it.

HAZARDS ANALYSIS

The influence of the Himalayan, the Assam, and the Burmese mountain ranges in the north and the northeast, and the Bay of Bengal in the south, results in the tropical monsoon climate of the country. In addition, the country's location along approximately 600km of coastline, leaves huge tracts of land open to the destructive effects of cyclones and storm surges.

- 50 out of total 64 districts were flooded;
- 347 out of total 460 upazilas were affected;
- 19,000 square miles of area out of total area of 55,589 square miles was under flood water;
- 24 million people out of a total of 100 million were affected by the flood;
- 4.5 million acres of land out of a total cultivated area of 20.15 million acres were affected or damaged;
- 2000 people died;;
- 1500 kms of roads and highways were d destroyed;
- 1,200 bridges, culverts and segments of embankments were washed away;
- 6,800 school houses and other educational institutions were destroyed.

The 1988 flood was probably the worst flood in a century. The capital Dhaka along with two-thirds of the total area of the country was under flood water for several days. Fifty four out of sixty four districts (300 of its 460 upazilas i.e. sub-districts) were inundated by three meters or more water. Thirty million people were forced to climb on roofs, treetops or whatever toeholds of dryland remaining above the deluge. The damage to poultry was the most staggering. The infrastructures which were not well-built and well-maintained simply washed away. There were colossal deaths of men and animals as well. 1.2 million homes were totally destroyed, 2.4 million were damaged. Eighty one per cent of the totally destroyed homes belonged to the rural poor. Approximately 1.5 million acres of crop land were affected. The loss of crop production in the damaged area was estimated at about 1.6 million tons. However, this loss was estimated on the assumption that a part of the damage would be compensated by higher yields in areas where flood brought in sediments. But the prolonged drought which followed the flood may have distorted this estimate. But the fact remains that the floods damage crops and other materials only in some localities. It was identified by three BIDS researchers that 125 upazilas with similar land levels and cropping patterns spreading over districts of Dhaka, Manikganj, Tangail, Jamalpur, Mymensingh, Kishoreganj, Netrokona, Sylhet, Comilla, Faridpur, Pabna, Shirajganj, Bogra, Gaibandha, Rangpur, Kurigram, Natore and a few others may have been severely affected.

Disasters in Bangladesh can be classified in two types. The first type is disasters which occur frequently, such as floods, tropical cyclones, storm surges, drought, and tornados. The second type are less frequent, but historically very destructive. Earthquakes and civil strife fall into this category.

Added to both are the "ongoing disasters" which constantly affect Bangladesh, and which impact directly upon disaster preparedness and relief. These are river bank erosion, the degradation of forests, fisheries, and other natural resources, increasing pollution and increasing concentration of that population, growing landlessness, and a rapidly expanding number of female heads of households among the poor.

Flooding

Flooding is one of the types of disasters often experienced in Bangladesh, causing millions of dollars of destruction each year to agriculture, housing, and infrastructure as well as taking thousands of human lives. There are many causes of flooding in Bangladesh. These include: the general low elevation of the increased discharge through the rivers; siltation at the junction of distributaries and main rivers; the rising of river beds (through siltation) due to earthquakes; the effects of embankment construction along upper reaches of rivers outside of Bangladesh; deforestation; backwater effects of ocean tides; the rise of the sea level; and coincidental peak flooding along several river channels.

Bangladesh experienced as many as seventeen devastating floods in the present century. Since independence Bangladesh experienced floods of vast magnitude in 1974, 1984, 1987 and in 1988. The 1974 flood was severe enough to cause a widespread famine. There was a sharp drop in the real wage of agricultural wage laborers and the real poor engaged in non-farm activities causing shrinkage in food entitlements. The fluctuations in food availability, employment and prices which followed 1974 flood left deep marks in the memory of people and since then natural calamities, particularly floods, have become a politically sensitive issue for the government.

The Bangladesh flood of 1987 was highly devastating. It was then said that there was no record of such a flood in the last forty to fifty years or so in the country. There was a series of floods in 1987. The first signs of flood were seen in June. Larger areas began flooding in July and it continued through September. The first flush of flood was observed in northern parts of the country. It then flowed down to the central and southern parts. Before the water could barely recede, there were waves of flood -- a second, a third and a fourth time. The waters always flowed from the northern to southern parts of the country. The destructions caused by 1987 flood were indeed staggering:

In 1987, districts like Pabna, Rajshahi, Dhaka, Noakhali, Tangail, Bogra were severely affected. Similarly, in 1974, Comilla, Noakhali, Dhaka, Kishoregonj, Faridpur and Pabna districts were badly affected. On the other hand a number of other districts were badly affected. On the other hand a number of other districts which were just touched by the floods showed impressive record of crop production.

The impacts flood of 1988 were most severe on the children and women belonging to the poorest. This is being reflected in the high incidence of diarrhea, measles related disease, and high rates of infant mortality in the post-flood period. Although no accurate figures are available, the Mission and the NGOs noted widespread panic sales of land and personal effects, declining rural wages, and increased borrowing at very high interest rates.

Housing is also extremely vulnerable to floods and cyclones. The typical rural house in Bangladesh is a one-room structure of clay or rice straw and bamboo. In areas where flooding occurs regularly, earthen plinths 4 meters high are used to raise houses above the flood level. However, the houses are not often of permanent resistance and must be replaced every two to three years.

Tropical Cyclones occur at the rate of 1.3 a year in the coastal districts of Bangladesh. It registers the area one of the world's most cyclone-prone. These cyclones, which form over the Bay of Bengal, are associated with high winds in excess of 150 kilometers per hour, and large storm surges (tidal bores), which often crest at 30 feet. Storm surges are far more devastating to land, people, and buildings than cyclones. The range of 12 feet between low and high water in the northern Bay of Bengal can render even a storm of moderate intensity approaching the coast at high tide just as dangerous as, or even more dangerous than, a severe storm which coincide with low tide.

Cyclone of November, 1970 in South Bengal

A depression formed in South and adjoining central Bay, moved at N and NNE, intensifying into severe cyclonic storm, then NE, crossed coast of Bangladesh, weakened over south Assam; storm surge (4-5 metres high) caused unprecedented damage in off-shore islands and coastal districts of Chittagong, Noakhali, Patuakhali, and Bakerganj; is one of the greatest disasters in recorded history, estimates of number of people killed range from 300,000 to 1,000,000; enormous damage to property, crops; most cattle and poultry lost.

Cyclone of May 1985 in Urir Char

A devastating cyclone hit the coastal districts of Bangladesh at 3 a.m. at a speed exceeding 130 kph. creating tidal waves more than 12 ft. high washing away entire villages before the inhabitants had a chance to react. The extent of the devastation became clear only after a survey ship of the Land Reclamation Project of the BWDP spotted floating dead bodies near Sandwip on 24 May. The administration announced 2,086 corpses were recovered and about 5,000 people were missing. The fate of several hundreds of fishermen away in the Bay of Bengal is not known. The unofficial death toll, however, ranged around 100,000. The following areas were worst affected: Urir Char, Monpura, Southern Sandwip, Southern Bhola, Dublar Char, at farther south, Maheshkhali and Teknaf. In total 900 sq. miles of 6 coastal districts had been ravaged destroying 133,000 areas of crops, 100,000 heads of livestock and affecting about 1.2 million people. A total of 74 miles of BWDB coastal embankment was washed away. Besides, there was a widespread disruption of power transmission and surface road communication in the whole area.

Tornados

Tornados are less frequent than cyclones, but can devastate entire towns. While existing NGO and BDG systems may be able to provide relief in a timely fashion, the kinds of aid required are often outside the Mission's areas of expertise. Cash contributions are the most appropriate intervention in this case.

A deadly tornado hit parts of Manikganj district about 70 kilometers north of Dhaka in the evening of 26 April, 1989. It was concentrated in an area of about 50 square kilometers wiping out virtually all the houses, trees and crops. Eight hundred people were killed. The loss of livestock and poultry was enormous. There was a similar tornado back in the mid sixties in Demra (adjoining Dhaka) causing colossal loss of men and materials.

Drought

Drought surely affects the crop production and livestock. During the dry season (October to June), failure of monsoon causes reduction of river floods. Water shortages during this season are felt most severely in the northeastern portion of the country and in the lower delta areas.

Again, the outcomes were largely dependent on the droughts which normally followed the years of flood. The country experienced severe droughts in 1979, 1981, 1982 and in 1989. Indeed, the crop loss due to drought has been no less than that of flood. The drought has also other long term implications. The soil dries and becomes

unsuitable for crop cultivation. The ground water level goes down. The problem aggravates as there can be no further recharge of ground water. Irrigation becomes difficult. There can be acute shortage of drinking water as most tubewells fail to raise water. There can be severe health hazards in the form of cholera/diarrhoea due to shortage of proper drinking water. The small and marginal farmers are the worst victims of this disaster. The rich farmers may, in fact, make spatial adjustments and leave the drought margins but the marginal farmers are condemned to live in the drought (and also flood) prone areas. There are social dimensions of the crowding of the drought prone areas by marginal farmers as well.

Earthquakes: Geologically, most of Bangladesh forms a part of the Bengal Basin, a seismically active area. The country can be divided into four seismic zones: high intensity, moderate intensity, low intensity and negligible intensity. During the past 100 years, the country has received damage from five major earthquakes (in 1887, 1918, 1930, 1934, 1950). The 1887 quake was strong enough to change the course of the Meghna river. Dhaka may be due for a major earthquake, according to some seismologists. Dhaka has witnessed 4-6 minor earthquakes in the last year.

Vulnerability of Infrastructure

In the event of severe flooding or a cyclone, the two most common destructive disaster types in Bangladesh, the country's infrastructure would be very vulnerable to damage from winds and water associated with these phenomena. The two major ports, Chalna (Khulna district) and Chittagong (Chittagong district) and one of the major airports, also at Chittagong, are located in two of the most cyclone-prone regions of the country. These facilities would more than likely be forced to close during a cyclone, storm surge, or major flood, and would possibly suffer some degree of damage. Inland waterways would most likely be affected also. During the monsoon season, these waterways may be too swollen with flood waters for normal river traffic.

Additionally, numerous hospitals, electric power plants, natural gas plants, oil refineries, and steel mills are located throughout Bangladesh in disaster-prone regions, and would possibly be subject to shutdowns or damage from natural disasters.

Vulnerability of Agriculture

Agriculture, the most important sector of Bangladesh economy, extremely vulnerable to natural disasters, principally floods, droughts, cyclones, and storm surges. Floods are perhaps the most frequent destructive force to agricultural lands. Seasonal flooding is normal over one-third of Bangladesh. Traditional land use and cropping patterns are closely adjusted to the seasonal flooding is earlier, higher, or later than normal, thus drowning standing crops or preventing (or delaying) the sowing of a major crop. Droughts occur

during the dry season (October to May) when river flow is sharply reduced. Crop damage by cyclones is only partly attributable to the strong winds. It is usually caused by associated heavy rains and consequent flooding. Storm surges are destructive when flood waters are highly saline. These disasters affect not only agricultural crops, but food reserves and livestock as well.

AGRICULTURAL CROP CALENDAR FOR BANGLADESH

<u>Crop</u>	<u>Planting</u>	<u>Harvesting</u>	<u>Transplanting</u>
Maize	April-May	July-August	
Rice-Aman	March-May	November-December	
Aus	March-May	July-September	
Boro	Sept.-December	March-May	October-December
Sugarcane	Feb.- March	December-January	
Wheat	Oct.- November	February-March	

CROPS BY REGION

Coast rice, (aman, aus, boro), sugarcane
 Highlands: maize, rice (aman, aus), sugarcane
 Northeast: maize, rice (aman, aus, boro), sugarcane
 Northeast: maize, rice (aman, aus), sugarcane, wheat
 West: maize, rice (aman, aus, boro), sugarcane, wheat

CONCLUSION

While disasters have serious direct impacts in terms of physical damage, injury, and the loss of life, the greater threat is the economic impact upon the poor, particularly children. While international and national attention is greatest during and immediately after a disaster, the Mission must focus its greatest attention to the period 3-12 months after the main events, when international and official attention tends to wane. It is precisely in this period that wage depression, unemployment, usury, and migration are likely to occur to the extent that disaster relief and rehabilitation efforts fail. It is also at this time that the Mission is able to obtain better information from the field and act with greater effectiveness.

SUMMARY DISASTER RESPONSE

FLOODS

- Principal Vulnerabilities: Diarrheal disease, loss of land, employment, panic sales, food shortages, famine over the following 3-12 months.
- Vulnerable Regions Depending upon severity, most of Bangladesh, but Northeast, delta, and Dhaka esp. vulnerable.
- Mission Response Options: Well-targeted food aid, ORS, WPT, seed, cash, additional nutritional and food price surveillance in the following 3 to 12 months.

CYCLONES/STORM SURGES/TORNADOS

- Principal Vulnerabilities: Destruction to forests, animals, power lines, roads, housing and other infrastructure; diarrheal disease (if cyclone is accompanied by flooding/surge); loss of standing crops.
- Vulnerable Regions Southern and southwestern areas for cyclones and storm surges, central and northern regions for tornados.
- Mission Response Options: Cash, limited food aid, ORS, WPT, TA to help restore power lines and repair feeder roads.

DROUGHTS

- Principal Vulnerabilities: Similar to those of floods. Famine and heavy migration more severe.
- Vulnerable Regions Northerwestern area especially.
- Mission Response Options: Well-targeted food aid, ORS. Additional nutritional surveillance.

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EARTHQUAKES

Principal Vulnerabilities: Death and injury, destruction of buildings, homes, communications, other infrastructure.

Vulnerable Regions Sylhet region most seismic, but Dhaka and other cities highly vulnerable.

Mission Response Options: Cash a high priority. Search and rescue and first aid support may be required, especially if in Dhaka.

CIVIL STRIFE

Principal Vulnerabilities: Death and injury, destruction of buildings, homes, communications, other infrastructure.

Vulnerable Regions All, Dhaka and Chittagong especially.

Mission Response Options: Limited scope of action during period of strife. Cash and food in refugee areas, as well as medical support may be required when delivery becomes feasible.

**HISTORY OF MAJOR
NATURAL DISASTERS IN BANGLADESH
(1918 - 1988)**

<u>Date</u>	<u>Disaster Type</u>	<u>Location</u>	<u>Number Killed</u>	<u>Affected (1000's)</u>	<u>Damage (\$ Mil.)</u>
1918	Influenza Epi.	Nationwide	393,000	N/A	N/A
1943	Famine	Nationwide	1,900,000	N/A	N/A
10/20/58	Cyclone	N/A	500	N/A	N/A
10/20/59	Cyclone	Bay of Bengal	14,000	N/A	N/A
1960	Flood	N/A	10,000	N/A	N/A
10/09/60	Cyclone	Coastal Area	3,000	N/A	N/A
10/30/60	Cyclone	Coastal Area	5,149	N/A	N/A
05/09/61	Cyclone	Meghna Estuary	11,200	N/A	11.9
05/30/61	Cyclone	Coastal Area	11,466	N/A	N/A
05/28/63	Cyclone	Chittagong	11,500	1,000	46.5
05/11/65	Cyclone	Barisal dist.	36,000	10,000	57.7
12/15/65	Cyclone	Chittagong-Teknaf	847	60	N/A
10/01/66	Cyclone	Chittagong, Sandwip	850	500	22.4
04/14/69	Cyclone	Dhaka & Comilla	849	160	N/A
11/12/70	Cyclone	Khulna, Chittagong and B'Baria	300,000	3,648	86.4
03/25/71	Civil Strife	South Coast	200,000	27,000	1,400.0
07/74	Flood	Nationwide	28,700	36,000	579.2
04/01/77	Typhoon	5 Districts	600	N/A	N/A
04/78	Refugee/Burma	Chittagong Dist	6,150	200	N/A
04/09/78	Storm	Bay of Bengal	1,000	N/A	N/A
08/80	Flood	Nationwide	655	10,000	150.0
09/84	Flood	Nationwide		28,000	600.0
09/85	Cyclone	Noakhali, Chittagong & Bhola Dist.	7,000	1,279	5.3
09/87	Flood	Nationwide	700	30,000	
7-9/88	Flood	Nationwide	2,500	50,000	
04/26/89	Tornado	Manikganj	800	100,000	4.0

SOURCE: OFDA Disaster History on file in Washington, D.C. Covers 1900 to the present..

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II. Disaster Information Team

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Frank Young	Acting Deputy Director
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Nasir U. Ahmed	PDE, Engineer (in the event of destructive disasters)
Sheryl Keller	OPH, Nutrition and Health Specialist
M.M. Ershadullah	OFA, Food and Agriculture Specialist
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Appendix B

PRINCIPAL CONTACTS FOR DISASTER OPERATIONS

(As of September 1, 1990)

I. Disaster Assistance Team

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Frank Young	Acting Deputy Director
Marion Warren	Acting Program Officer
Jose Garzon	Mission Disaster Relief Officer NGO Liaison Officer
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Brad Fujimoto	Environmental Officer
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Ministry of Relief
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7. World Bank
Mr. Guyer, Disaster Coordinator
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8. World Food Program (WFP)
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9. World Health Organization (WHO)
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OFFICE OF FOREIGN DISASTER ASSISTANCE (OFDA)

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CYCLONE AND FLOOD WARNING

CYCLONES

Cyclone warning systems are fairly well developed in Bangladesh (see Section IV. B). The principal sources of information are the Meteorological Department, SPARRSO, and the Fleet Weather Center in Guam (FLENUMOCEANCEN).

Storm warning messages for storms originating in the Bay of Bengal are cabled to the Embassy from Guam. The messages provide the present position of a storm and its predicted position in the next 24 hours. Warning regions are specified into four categories (red, orange, yellow, green) depending upon proximity to cyclone.

Any storm whose present or predicted position is north of 18 degrees latitude should be observed closely. Information should be shared with the MET and SPARRSO. (Bangladesh lies in the north eastern part of South Asia between 20 degree 34' and 26 degree 38' north latitude and 88 degree 01' and 92 degree 41' east longitude).

In assessing the possible impact of a cyclone, the key variables are:

1. Wind speeds: Tropical depressions, storms, and cyclones are classified by Maximum Wind Speed (MWS). A "Category 3) storm, or moderate cyclone, carries a MWS between 50-125 miles per hour. A severe cyclone carries winds between 80-200 miles per hour.

2. Direction: Cyclones generally follow a northeasterly track from the Bay of Bengal toward Chittagong, or Comilla, and less frequently toward Noakhali, Barisal and Khulna. Cyclones have been known to pass over Dhaka and even Pabna (see Figure 1).

3. Surge factor and timing: Tidal surges (or tidal bores) often exceed the damage caused by winds. Surges are known to crest at 9 meters. Because crests of up to 4 meters between low and high tide are common in the northern Bay of Bengal, a storm of moderate intensity approaching the coast at high tide can be as, or even more dangerous than a severe storm at low tide. Any surge during high tide, as well as any surge over 2 meters during low tide is likely to cause damage.

FLOODS

Flood prediction in Bangladesh is more problematic. The MET's Committee of Experts provide monthly rainfall reports and predictions on a monthly basis. The MET also issues 10 day, and weekly forecasts, and issues 24 hour forecasts every 4 hours, for every region in Bangladesh. The BWDB also issues warnings on river levels. However, it is often difficult to translate this data into useful information as to the future occurrence and location of floods.

The Mission therefore relies heavily on informal channels to learn about flood situations after they have occurred. Channels include the media, the NGOs, direct observation, and direct contact with local officials. Newspaper reports, as well as official reporting from the BDG should be corroborated with evidence from other sources.

In 1989, the Mission instituted a "Phased Alert System" (see 89 Dhaka 05639). This procedure defines three benchmarks for flood reporting:

Stage I. Normal flooding, below 10,000 sq. miles.

Stage II. Flooding between 10,000 and 15,000 sq. miles. While this is normal, it bears watching. Some villages will be isolated, and some distress reported.

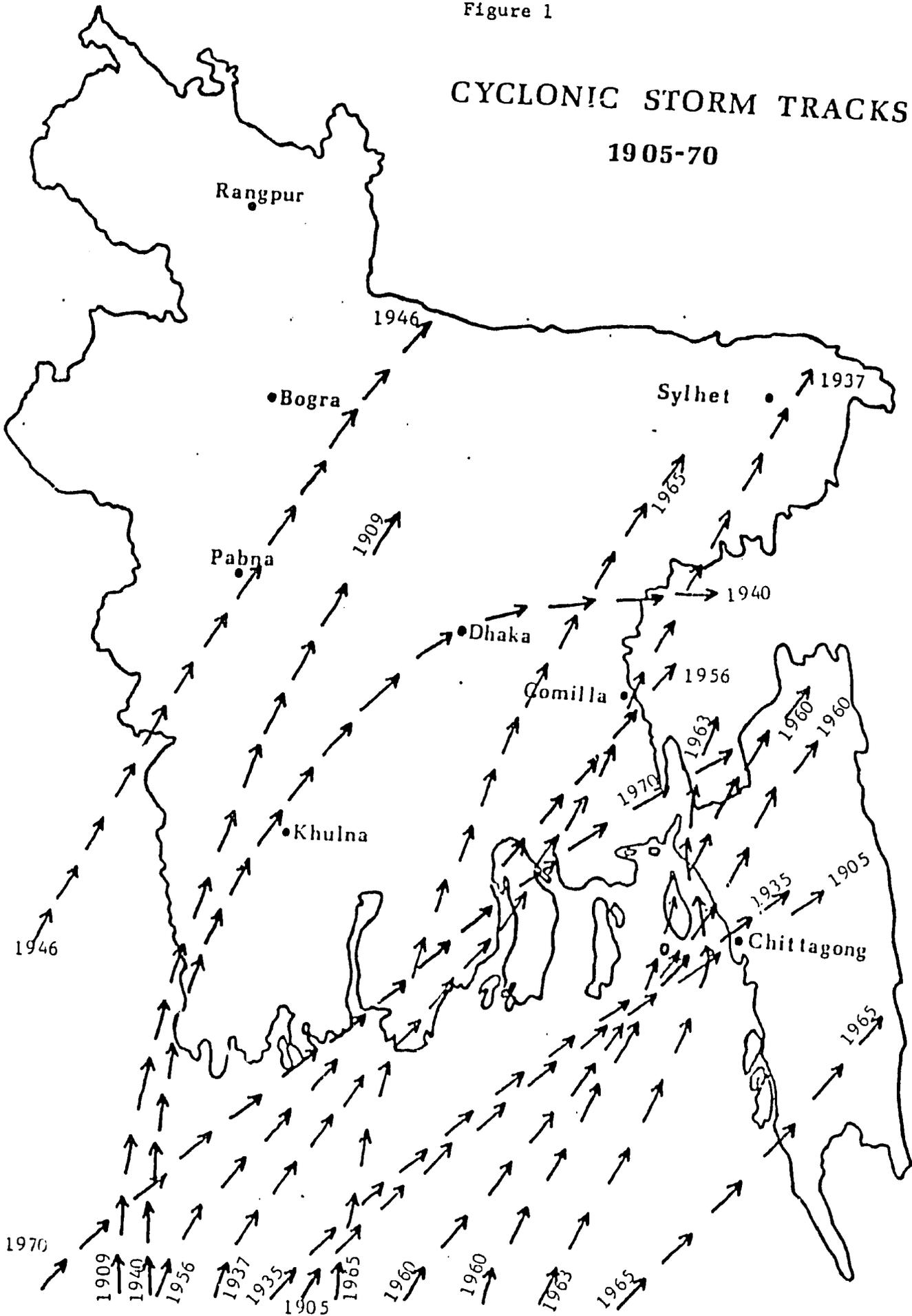
Stage III. Flooding over 15,000 square miles. This is likely to lead to serious destruction of crops, communication, and infrastructure. BDG requests for assistance will be likely. The flood of 1987 inundated 22,000 sq. miles; those of 1988, covered 34,700 sq. miles.

Additional factors to be considered include the time of the year, the extent of advance warning, the speed with which the water rises, its duration, and flooding or excessive rainfall in India.

Weekly, and if necessary, daily reporting cables are sent to OFDA, the desk, FVA/FFP, STATE/NEA/PAB, Geneva for UNDRO and LRCS, Rome for FODAG. Sample cables are on file. Guidelines for reporting are established in Manual Order 300-5.

Figure 1

CYCLONIC STORM TRACKS 1905-70



Source: USAID Mission/Dhaka

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