BANGLADESH

Emergency Livelihood Protection and Rehabilitation Programme Appraisal

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EMERGENCY LIVELIHOOD PROTECTION AND REHABILITATION PROGRAMME APPRAISAL DOCUMENT

ROME, JANUARY 2008

Food and Agriculture Organization of the United Nations (FAO)

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LIST OF ACRONYMS AND ABBREVIATIONS

ADAB	Association of Development Agency in Bangladesh
ADB	Asian Development Bank
AI	Avian Influenza
BADC	Bangladesh Agricultural Development Corporation
BCAS	Bangladesh Centre for Advance Studies
BER	Bangladesh Economic Review
BFDC	Bangladesh Fishery Development Corporation
BFRI	Bangladesh Forest Research Institute
BRRI	Bangladesh rice Research Institute
CBO	Community Based Organization
CCF	Chief conservator of Forest
CHT	Chittangong Hill Tracts
CPUE	Cash Per Unit Effort
DAE	Department of Agricultural Extension
DANIDA	Danish International Development Agency
DFO	Divisional Forest Officer
DLS	Department of Livestock Services
DOC	Day Old Chicks
EC	European Commission
EEC	Exclusive Economic Zone
FAO	Food and Agriculture Organization of the United Nations.
FD	Forest Department
FFS	Farmers' Field School
FMD	Foot and Mouth Disease
FRA	Forest Resource Assessment
FS	Foundation Seeds
GDP	Gross Domestic Products
GIS	Geographical Information System
GoB	Government of Bangladesh
HH	Household
HYV	High Yielding Varieties
ILO	International Labour Organization
IFAD	International Fund for Agricultural Development
IPM	Integrated Pest Management
ICM	Integrated Crop Management
IP	Implementing Partners
Kg	Kilogram
I.o.a	Length over all
LV	Local Varieties
MDG	Millennium Development Goal
MoA	Ministry of Agriculture

MoEF	Ministry of Environment and Forest
MoP	Muriate of Potash
Mt	Metric Tonne
NAEP	New Agricultural Extension Policy
NGO	Non-Governmental Organization
QDS	Quality Declared Standards
RFLDC	Regional Fisheries and Livestock Development Co-operation
RIMS	Resource Information and Management System
SAAO	Sub-Assistant Agricultural Officer
SCA	Seed Certification Agency
SIDR	Cyclone SIDR
SPG	Seed Producers Group
SPPSP	Strengthening Plant Protection services Project
T. Aman	Transplanted Aman Rice
TK	Taka (Bangladesh currency)
TS	Total Solid
TSP	Triple Superphosphate
ULO	Upazila Livestock Office/Officer
UNDP	United Nations Development Programme
UNESCO	United Nations Education Scientific and Cultural Organization
UNICEF	United Nations Children Fund
USAID	United States Agency for International Development
USD	United States Dollar (USA currency)
WFP	World Food Programme of the United Nations
Yr	Year

INTRODUCTION

This programme document was prepared in close collaboration, coordination and participation of the Government of Bangladesh (GoB) at all relevant national and sub-national levels. The assessment/appraisal mission (3-22 December 2007) enjoyed unlimited access to the initial government cyclone-SIDR assessment findings at both national and district levels. Following the field visits, the Mission made a presentation of its findings and a roadmap to rehabilitation in the four sub-sectors.

Under the chairmanship of H.E. Advisor Dr. C. S. Karim, the Mission received comments from the Ministries of Agriculture, Livestock and Fisheries, and Forests and Environment. The draft programme document was also shared with relevant Technical Divisions in FAO/HQ and FAO Regional Office for comments and technical clearance.

Detailed programme activities under four components were discussed in significant details during a one-day workshop jointly organised by the GoB and the United Nations in Dhaka on 7 January 2008. The participants in the discussion group of the Workshop included staff from the three main Ministries, some national and international NGOs, the World Bank and other institutions.

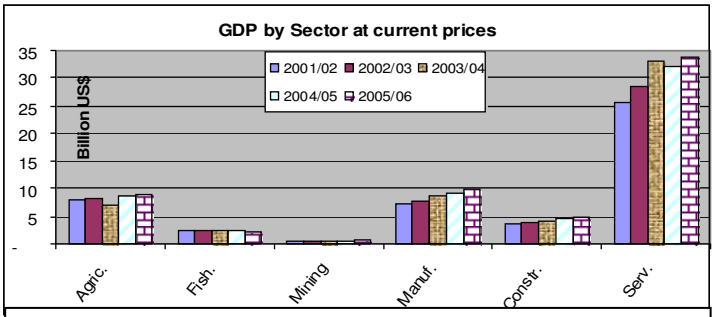
This final version of the programme document includes comments from the three Ministries of the GoB and the relevant Technical Divisions in FAO as well as comments from the one-day National Workshop on Cyclone-SIDR Early Recovery and Rehabilitation.

Rome/Dhaka January 2008

A. BACKGROUND AND THE NATIONAL ECONOMY

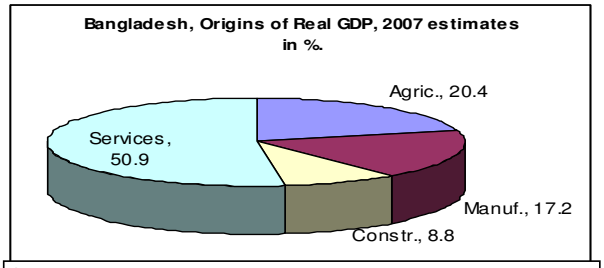
Bangladesh is a low-lying delta with more than 230 rivers and tributaries defining and conditioning much of the physical and natural resources of the country. Despite significant achievements since independence in 1971, nearly 44 percent of the population live below the poverty line. With a land area of 147 570 square kilometres and a population of more than 140 million[1], it is one of the most densely populated countries in the world (941 people per square kilometre). Population growth has declined from 2.2% per year in 1991 to about 1.4 % in 2006/07. Containing population growth remains a top priority given the scarcity of land and other resources.

Gross Domestic Product (GDP) is estimated at about US$429 per capita per year with an annual growth rate of 6.5 percent (2006/07). GDP growth is forecast to somewhat slow down to 6.2 percent in 2007/08 factoring in the losses caused by last year's floods. The cyclone Sidr may further slow down the economy, given the scale of devastation and its multiplier effects in the wider economy. Services account for more than one-half the GDP. Manufacturing, 17.2 percent of the GDP, is heavily dependent on imported raw-material and capital goods.



Source: Bangladesh Bureau of Statistics, Monthly Statistics Bulletin

The agricultural sector accounts for more than 20% of GDP and employs more than 50 percent of the labour force. Rice production accounts for more than 70 percent of the sector's value added and productivity since mid-1970s have grown by about 150 percent making the country self-sufficient in food production. There is very little room for expanding area under cultivation, rising productivity and crop diversification, however, has been remarkable over the past couple of decades. Trade deficit in 2007 is estimated at US$3.7 billion and is forecast to widen to US$4 billion in 2008 and US$4.4 billion in 2009. This is largely due to growing import bill for oil and high demand for capital goods and industrial raw material. Despite the widening trade deficit the current account has posted surplus, owing to record inflows of remittances from workers abroad. During 1994/95 fiscal year remittances accounted for 3 percent of GDP, which steadily increased to 7.7 percent in 2005/06. This trend is expected to rise further as the sources of remittances have been shifting over the recent past.



Source: Economic Intelligence Unit, 2007.

[1] Population estimated in mid 2006 at 138.8 million and population growth at 1.3 percent per year.

Table 1: Main Composition of Trade 2001/02 – 2005/06
Fiscal Year (Jul-Jun) (US$ million)

	2001/02	2002/03	2003/04	2004/05	2005/06
Imports CIF					
Capital Goods	2,617	2,735	2,739	3,423	3,910
Textiles	1,784	1,896	2,366	2,836	3,039
Petroleum and products	724	887	1,021	1,566	2,007
Chemicals	335	353	406	511	575
Other	3,081	3,787	4,370	4,827	5,223
Total Imports	**8,541**	**9,658**	**10,902**	**13,163**	**14,754**
Exports FOB					
Readymade garmets	3,355	3,601	4,433	5,472	6,308
Fish and Prawns	294	321	388	422	494
Jute Products	243	220	216	276	317
Leather and hides	228	212	245	263	289
Other	1,266	1,387	1,603	1,839	1,910
Total Exports	**5,386**	**5,741**	**6,885**	**8,272**	**9,318**
Trade Balance (X-M)	**- 3,155**	**- 3,917**	**- 4,017**	**- 4,891**	**- 5,436**
Remittances from Bangladeshis Working Abroad	**2,501**	**3,062**	**3,372**	**3,848**	**4,801**

Source: Ministry of Finance, Bangladesh Economic Survey and Export Promotion Bureau.

Agricultural production, lives and livelihoods are constantly threatened by natural and human induced hazards such as floods, cyclones, droughts, tidal surges, tornados, earthquakes, river erosions, water logging, water and soil salinity and high arsenic content in ground water. Many communities have adapted to some of the natural hazards as part of their coping mechanisms. However, some hazards are very large in scale and easily exhaust community capabilities to cope. Climate change is seen to increase the severity and frequency of these large scale hazards, which will further augment community risk and vulnerability.

In July/August 2007 severe floods affected some 10 million people and compromised some 13 percent of the total rice crop. The floods had also stretched and in some cases exhausted local and national coping capacities. Flood rehabilitation were underway when a powerful cyclone Sidr (Category IV) with wind speeds of up to 240 kilometres per hour hit Bangladesh on 15 November causing significant damage to life, livelihoods and productive infrastructure. The most affected areas are Barguna, Bagerhat, Pirojpur and Patuakhali districts. In total some 30 districts in the South of the country have been affected to various degrees. Latest government estimates indicate that a total of 8.7 million people or nearly 2 million households have been affected. Nearly 1.5 million houses and some 4.1 million trees have been damaged in addition to a large number of livestock, fish ponds and capture fishery boats and gear. The Sunderban mangrove forests, a world heritage site and the largest in the world, incurred severe damages. The Sundarbans form a natural buffer protecting millions of people in Bangladesh from the Bay of Bengal and provide critical breeding grounds for fisheries. In addition to significant environmental and ecological functions, the Sundarbans also play major social and economic functions and many communities depend on them for their livelihoods.

The Government of Bangladesh (GOB) requested FAO to field a damage and needs assessment mission with a view to prepare a programme to cover immediate and medium term rehabilitation needs. It is in this backdrop that a 14 member mission (4 International and 10 National experts) was fielded between 4 and 22 December 2007.

B. EMERGENCY CHALLENGE: COUNTRY CONTEXT, RECOVERY STRATEGY, AND RATIONALE FOR PROPOSED PROGRAMME

B.1. Emergency Context and Summary of Mission Findings

Cyclone Sidre has affected, to various degrees, some 33 out of 64 districts in the country. In total some 8.7 million people have been affected at a time when the country hardly had a chance to recover from devastating floods a few months earlier. The floods alone had affected some 10 million people and took large swathes of precious agricultural land out of production. Table 2 below shows the severity of damages caused by cyclone Sidre in various sub-districts. This closely follows the path of the cyclone (inundation and wind speed) and there is a close correlation between the cyclone path and the damages caused to each of the four sectors. The Mission estimates that up to 70 percent of the Boro season crops, mainly rice and grass pea, were damaged in the severely affected sub-districts and between 20-40 percent in the moderately damaged sub-districts. In addition, crop damages in further 5 districts in the South (not mentioned in the table below) have also been estimated at about 10 percent of the normal production levels. For more details see Annex 2, Table 1.

Damages to fish and shrimp ponds/enclosures also closely follow the geographical distribution of the damage severity presented in Table 1 below. Inundation, oxygen depletion, damages to dykes and pond structures as well as some loss of equipment and fish stock have been the main damages to the aquaculture sector. A large number of fisher folk lost their fishing gear and houses. The fisher communities usually live on the marginal lands of the coastal areas and were the first to experience the full force of the cyclone. Most of the fisher folk are not necessarily owners of the gear (boats and nets) but rather are employed by boat owners. Remuneration from capture is either in kind or cash and the level of payment vary across owners, season and geographic location. The majority of fisher folk lost their only source of livelihoods as a result of damages caused to boats and nets as a source of employment. For more details of the damages see Annex 1, Tables 1 and 2.

The government has made a sound estimate of livestock losses by enumerating the number of losses in most of the affected districts. In five most affected districts some 18 percent of the poultry, 11 percent of goats and sheep, 7 percent of ducks and some 3 percent of the cattle and buffalos have been lost. The losses are significantly high in some of the severely affected sub-districts, exceeding 80 percent of the total livestock population. A large number of livestock have been injured from falling trees and collapsing sheds and almost all large animals are visibly very weak and susceptible to diseases. Most of the crop residues, the main source of feeding, are non-edible due to inundation and the spread of fungus following the cyclone. Feeding is a major issue and some farmers have begun washing up the rice stems, which may be partially edible but certainly not sufficient to feed the remaining cattle and buffalos. Goats and poultry usually scavenge and require little additional feed. The death of cattle and buffalos has also reduced the amount of draught power available to farmers in the ensuing season. For more details on livestock casualties see Annex 3, Tables 4-7.

In the Sundarbans some 4-5 percent (20 -25 000 ha) of forest area has been severely damaged and nearly 15 percent (60 000 ha) partially damaged. Some alien species, which had been planted in various parts of the Sundarbans on a pilot basis, have been uprooted while in the severely affected areas a large number of trees have been broken from the stem or uprooted. In the partially damaged areas many branches have been broken but the main trunks of the trees are intact. Infrastructure in the Sundarbans and elsewhere in the affected areas has also been damaged. Some of the structures require rebuilding and some others major repairs.

Social forestry has made significant achievements over the past few decades, not only increasing the protective belt along the coastal areas, embankments, roads and railways, but also significantly increasing tree planting in the homesteads. The homestead gardens

provide great protection against strong winds and cyclones but also are a significant source of income. Trees are also a good buffer stock and sold at times of hardship and when social expenditure is necessary. Unfortunately, some of the alien species planted around the houses, along roads, railways and embankments also caused significant damages to lives and property. The main culprits are three alien species, rain-tree, Chambal and mahogany, which are fast growing trees and the only trees in the area to grow very big. Their size, growth rate and a relatively good income have made these trees the favourite and most of the people the mission visited would like to grow them again but perhaps not close to their houses. Exact data on the number of fallen trees are not available but the mission estimates that nearly 70 percent of the alien species in the 5 worst affected districts have been completely broken or uprooted. In addition some 3,400 ha (20%) of new plantations (less than 2 years old) and some 4,000 ha (5%) of older trees in the coastal belt have been completely destroyed, which require replanting. Furthermore, some 380 kilometres of embankments have been washed away, which provide the much needed protection from annual floods and tidal surges.

Table 2: Districts and sub-districts ranked by damage severity

Sl no.	Name of District and Upazila	Status of damage
Bagerhat		
1.	Sarankhola	Severe
2.	Morolganj	
3.	Mongla	Moderately
4.	Kachua	
5.	Rampal	
6.	Sadar	
Pirojpur		
1.	Mathbaria	Severe
2.	Bhandaria (a part is OK)	
3.	Sadar	Moderate
4.	Kowkhali	
5.	Shaurpkathi	
Barguna		
1.	Patharghata	Severe
2.	Sadar	
3.	Amtoli	
4.	Bamna	
5.	Betagi	Moderate
Patuakahli		
1	Mirjaganj	Severe
2	Galachipa	
3	Kolapara	
4	Sadar	Moderate
5	Baufal	
6	Doshmina	
Barisal		
1	Bakerganj	Moderate
2	Sadar	
3	Gournadi	
4	Muladi	
5	Hijla	
Jhalokathi		
1	Kathalia	Severe
2	Sadar	Moderate
3	Rajapur	
4	Nalchiti	
Madaripur		
1	Kalkini	Moderate
2	Sadar	
3	Rajoir	
Khulna		
1	Dakope	Moderate
Bhola		Moderate

Source: Mission visits and government figures at the Division level (Barisal and Khulna).

B.2. Recovery Strategy

The programme envisages a series of immediate measures to enable farmers to resume their cropping, livestock and aquaculture activities. These are time-critical activities without which many households will not be able to engage in the recovery process of their livelihoods. Failing to assist farmers in their livelihood recovery process will increase the need for a protracted relief operation and increase the risk of further dependency on aid.

The programme intends to target the most affected districts as a priority and moderately affected districts later when more resources are made available. The severely affected

communities have lost their homes, crops, trees and other assets. They have exhausted most of their coping mechanisms and are highly vulnerable to complete destitution. The moderately affected districts, though highly vulnerable, may be able to partially begin their livelihoods with part of their productive assets still intact. However, all nine districts mentioned in Table 2 above will need additional resources to rehabilitate and improve their sources of livelihoods in the near future.

Vegetable and rice seeds, fertilisers, purchased inputs for aquaculture (fish and shrimp), fodder and medication for livestock will be provided to targeted households in the severely affected sub-districts (see table 2 above). Some of these inputs need to be provided by around the middle of February and others later in the year.

The proposed rehabilitation strategy for crops, horticulture, livestock, fisheries and forestry sectors are in support of long term government strategies for these sectors. In addition, the programme is fully in line with and in support of the government's draft disaster risk management strategy. The proposed rehabilitation strategy is within a broader framework of the UN cluster system and in support of the government recovery plan, which is envisaged to be phased over a period of two years.

Government Strategy

The Government is planning to undertake a comprehensive assessment of the impact of the cyclone and to identify immediate, mid-term and long-term needs of the communities in the four sectors. Advisor for the Ministries of Agriculture, Fisheries and Livestock, and Environment and Forest welcomed the FAO mission and stated this will complement the efforts by the government.

In a document prepared by the Honourable Advisor for the Ministries of Agriculture, Fisheries and Livestock, and Environment and Forest, Dr. C.S. Karim, for the Climate Conference in Bali, Indonesia[2] recovery and rehabilitation strategies of the Government of Bangladesh are outlined as follows:

1. The Sunderbans Mangroves have acted as the giant windbreaker and have thus reduced the loss of human lives and property. Therefore its rehabilitation back to its natural splendour must be considered carefully, which could help adapt and mitigate against climate change. The Ministry of Environment and Forest will study coastal afforestation programmes, considering their suitability and resilience to storms and water surges.
2. Climate resilient water management is key to addressing or minimising many of the threats to lives and livelihoods, both for agriculture and human consumption. The existing elaborate National Water Management Programme will need to be revisited and programme designs and implementation might require changes to take account of the climate change.
3. With regard to food security, it is proposed to build up a regional dynamic reserve to ensure food supplies when crop failures occur.
4. There is need for research for generation of new technologies and adapting or modifying existing ones for agriculture production in crops, fisheries, and livestock.
5. The impact of livestock losses is two-folded: loss of assets and loss of draught power in many areas. Although some agencies, especially NGOs, have begun introducing small power tillers, which might be an alternative, the replacement of livestock might be one of the priorities.
6. The government has already established a series of cyclone shelters. Multi-purpose community-owned and community-managed water-resistant cyclone shelters, both for communities and livestock will be required to minimise and mitigate future damages. Provision of basic commodities in such shelters, such as

[2] Footprints of Climate Change Now Writ Large on Bangladesh, Dr. S.C. Karim, Advisor, Ministries of Agriculture, Fisheries, and Livestock, and Environment and Forest, 25 November 2007

water, food and other items, will enable communities to survive after the disaster, before relief arrives.

7. Many community members involved in agriculture, fisheries, and livestock have acquired their assets by taking loans from government institutions and NGOs. While all concerned parties have been asked to halt loan repayments until April 2008, there is urgent need for alternative financing and refinancing.
8. While the existing cyclone warning system has helped reduce loss of lives, it may require revisiting so that information is easily accessible and understandable by the affected communities. Existing facilities around the country are old, both organisationally and technologically and require substantial investment to be modernised and equipped so that they can effectively respond.
9. Rehabilitation of embankments in coastal areas and expansion of embankments in those areas will provide additional protection for future cyclones.
10. While relief is urgently required for the next 3 months, immediate assistance in provision of seeds and fertilizer in the crop sector and fishing gears and boats in fisheries should be considered as initial immediate steps towards recovery and rehabilitation.

B.3. Main Institutions Involved in the Recovery Process

The Ministry of Food and Disaster Management (MOFDM) has taken the lead role in coordinating all recovery efforts at least for the next 12 months. In addition, the Ministries of Agriculture, Forestry and Environment, Fisheries and Livestock are also involved in coordinating all technical aspects of the proposed rehabilitation efforts in their respective areas of mandate. A national committee for Cyclone-Sidr Rehabilitation, supported by District and Sub-District (Upazilla) Committees have been established to facilitate coordination and implementation at all levels. The government Field Cyclone Coordination Unit is based in Barisal Division Headquarters.

Many national and international NGOs are also very active in implementation and coordination efforts at various levels. The UN agencies and other international organisations have also established regional coordination units in Barisal. The FAO-Emergency Field Coordination Unit (EFCU) will be opened in Barisal to closely coordinate, supervise and implement its field activities with government and other agencies. All field activities will be implemented in partnership with the relevant government technical institutions and partner NGOs at appropriate levels of operations.

Strategy of other International Agencies

In addition to the immediate assistance announced by the UN agencies, the UN country Teams have formed six clusters to respond to the needs of the cyclone-affected people for immediate relief & rehabilitation as well as assistance beyond the immediate relief. One of the six clusters is on early recovery.

While in Dhaka for the preparation of the field mission, several UN agencies, especially ILO, UNDP and WFP, and other development partners were visited by the Team Leader to ensure effective coordination and to avoid any possible duplication in both the assessment of needs and the design of future programme in response to those needs.

The ILO and WFP began their assessment missions in the field at the same time as FAO and TORs, questionnaires and other relevant information were exchanged between them and FAO team. Representatives of UNDP were met in separate meetings and the Team Leader provided full information on FAO's intentions.

ILO: Using the same approach as FAO (Livelihoods Assessment Toolkit), ILO began a comprehensive assessment in the field at the same time as FAO. ILO was planning to complete its assessment by the end of the month, concentrating on non-agriculture areas of livelihood in their programme design.

In particular, ILO will concentrate on the following areas[3]:

- job creation and income-generating activities for recovery of livelihoods;
- assistance required for starting business, micro-enterprises, economic assets like boats, houses, cottage industries, equipment, and need for capital to start business;
- community-based assistance relating to roads, schools, religious institutions, markets etc., through labour-based public works;
- assisting the local government institutions to provide essential support to the cyclone-affected people, particularly the most needy and vulnerable; and
- provision of short-duration skills to repair houses, boats, schools, markets and other institutions.

WFP: At the time of FAO assessment, WFP had also fielded a large mission to carry out a comprehensive relief and livelihood assessment, while distribution of essential food supplies had already started. WFP's assessment concentrated on a comprehensive household survey and a wide-ranging market survey to determine the actual need for food and how food security could be achieved through joint programmes with other UN agencies and partner organisations.
Food for Work (FFW) and Cash for Work (CFW) will be used by WFP to support communities and local authorities in the rehabilitation and restoration of socio-economic infrastructure and housing. A detailed assessment report and programme design is expected by early January 2008.

UNDP: Similar to WFP and ILO, UNDP fielded an assessment mission in the field from mid December 2007, which is expected to continue well into January 2008. While UNDP announced its assessment and future programme design would primarily concentrate on Early Recovery in economic sector as a whole, in separate meetings, the FAO Team Leader outlined FAO's intended response in agriculture, fisheries, livestock and forestry to avoid any possible duplication. UNDP's needs assessment report and programme outline is expected during the month of January 2008.

UNICEF: Has carried out similar missions and is already engaged in the rehabilitation and restoration of health and education sectors, working closely with government authorities and national and international NGOs.

UNESCO: Has been visiting the Sunderbans area in the South and has announced financial support in rebuilding of few offices cum residence centres, including water reservoirs and other facilities for the forest department in Sunderbans.

IFAD: Is not directly involved in the emergency programme, but have provided micro finance through government and NGO credit systems in the South-West and reported that at least 25% of their clients, some 44,000 member families, have been badly affected by the cyclone. IFAD, as part of national emergency policy, have stopped collecting loans until April 2008, but have not yet reached a final decision whether those loans might be written off due to the severity of livelihood and asset losses.

European Commission (EC): The EC and its affiliate agencies, such as ECHO have already provided substantial amounts of support from the early days of the cyclone for life saving programmes through government and NGOs. These include provision of food, shelter and drinking water. Additional assessments are expected in early 2008 with other development partners, such as the World Bank, USAID and the UN agencies to determine mid-term recovery/rehabilitation and longer-term food security needs in the country. In a meeting organised by the FAOR, the EC announced availability of funds for livelihood recovery interventions in 2008, especially for agencies with sound and solid programme.

USAID: Have provided some initial support to the Government of Bangladesh, direct budgetary support, and have requested the US government for additional funds to

[3] ILO Response to Post-Cyclone Rehabilitation & Economic Recovery, Terms of Reference for Rapid Livelihood Assessment, 18 November 2007

provide support in forestry sector, with special attention to Sunderbans as immediate need and mid-term Livelihood protection programmes.

The World Bank: Has already provided substantial budgetary support after the cyclone and additional support was just being finalised for rehabilitation of infrastructure and shelter, as well as rehabilitation of agriculture livelihood. The World Bank is planning its own mission by mid January 2008 to look into mid- to long-term issues in disaster management and risk reduction; coastal embankments; river bank protection; multi-purpose shelter; and research on the impact of climate change.

B.4. FAO Response

FAO has a long history of partnership with the GOB in its quest to eradicate hunger, malnutrition and poverty through the development of agriculture, forestry and fisheries sectors. FAO has also been an active partner of the GOB in protecting the environment and promoting sustainable development strategy as well as disaster risk management. Early recovery efforts are necessary to avoid the depletion of productive assets in the affected areas. Farmers usually take drastic and painful measures to begin their farming activities, which usually compromise long term household food security. In the absence of any immediate rehabilitation measures, productive activities are compromised and a protracted relief operation is necessary. Therefore, FAO strongly believes that not only a protracted relief operation will be necessary but also long term development goals, in particular the millennium development goals (MDGs) will be compromised if immediate action is not taken to rehabilitate and improve main sources of livelihoods in the cyclone-affected areas.

A holistic approach is necessary to address the rehabilitation requirements of all four inter-linked sub-sectors, which form nearly 80 percent of the livelihoods in the affected areas. The proposed programme, therefore, intends to rehabilitate the four sectors and where feasible build better in line with long term strategy and disaster risk management. Prioritisation is not only based on geographic targeting but also types of rehabilitation activities.

C. THE PROGRAMME

C.1. Programme development objectives

The overall programme objectives are to rehabilitate and, where feasible, build better the main sources of livelihoods in the cyclone affected areas of Southern Bangladesh. The overall programme objectives are to be achieved through a series of time-critical and immediate rehabilitation efforts in four agricultural sub-sectors namely, fisheries, crops and horticulture, livestock, and forestry.

C.2. Summary of Programme components

The proposed programme will consist of the following four components. Details of the four components are presented in Annex 1 - 4.

(i) Component I: Support to Fisheries Rehabilitation (US$13.8 million)

Sub-component 1: Aquaculture (US$3.8 million)

This sub-component envisages the rehabilitation and restocking of some 36,000 carp ponds and 8,300 Golda and 6,000 Bagda shrimp geers. Some of the most vulnerable and food insecure households will be targeted in six severely affected districts. In addition, training will also be provided to aquaculture farmers in improved fish/shrimp culture, simple processing, management and marketing. A total of 50,300 households will directly benefit from this intervention. This sub-component will be implemented by partner NGOs in close collaboration with the community organisations and the District/sub-district Department of Fisheries under the overall supervision of the FAO Emergency Field Coordination Unit.

Sub-component 2: Capture Fisheries (US$10 million)

Some 20,000 fisher households will be formed into groups of five and an additional 15,000 fisher households will be formed into groups of 10. A relatively small boat (Non-mechanised 25-30 foot) together with appropriate fishing gear and safety equipment will be provided to each of the groups (10 group of five each). Likewise a mechanised boat (35-40 foot) together with appropriate fishing gear and safety equipment will be provided to each of the groups (10 group of 10 each). In addition, the programme envisages substantial training in group dynamics, management, safety at sea, marketing and small scale processing. The training will also include environmental issues with regard to the fisheries sector as a whole. Improvements in the design of existing vessels has also been considered under this sub-component with the view to increase safety at sea and enable fisher folk to fish in deep waters rather than at the coastal areas. The indirect impact of this sub-component is seen to help introduce more sustainable and environmentally friendly fishing techniques with a potential significant impact on the fisheries sub-sector.

A detailed survey of the fisheries sub-sector in the southern districts of the country is envisaged to help resolve the information gap and the consequent management of the fisheries sub-sector. In addition, a study of the floating families/nomads is also considered to enable a better understanding of the socio-economic processes of a group about which very little is known.

This sub-component will be implemented by local NGOs with prior experience with fisher folk in close collaboration with the fisher communities, District/Sub-district Department of Fisheries and other organisations active in the sector (e.g. Danida and Caritas fisheries development programmes among others.). All operations will be under the overall supervision of the FAO- Emergency Field Coordination Unit.

(ii) Component II: Support to Agriculture Rehabilitation (US$22.2 million)

Activity 1: Support to horticulture Crop Rehabilitation (US$1.1 million)

The following specific interventions are envisaged under this sub-component:

- Provision of 300,000 fruit tree saplings to some 10,391 most vulnerable and food insecure households in 13 severely affected sub-districts (5 districts).
- Provision of 500,000 banana suckers to some 10,000 households in 13 severely affected sub-districts (5 districts).
- Support to some 20,000 vulnerable households in 13 severely affected sub-districts to rehabilitate betel leaf orchards.
- Provision of vegetable seeds to some 136,411 landless households to plant vegetables around their homesteads (kitchen gardens).

Activity 2: Emergency Cereal and Pulse Seeds Supply and Fertilisers Provision (US$15.8 million)

The following specific interventions are envisaged under this sub-component:

- Provision of 2.3 Mt of HYV Aus rice seeds, 9,895 Mt of Urea, 2,298 Mt of TSP and 2,298 Mt of Potash, targeting some 460,000 vulnerable households in four severely affected districts. Each household receiving 5 kg of rice seed, 15 Kg of Urea, 5 kg of TSP and 5 kg of Potash to plant some 0.13 ha of land (1 bigga).
- Provision of 2,698 Mt of Amon rice seed (75% Local Varieties and 25% HYV), 9,315 Mt of Urea, 2,698 Mt of TSP and 2,698 Mt of Potash to some 211,398 most vulnerable and food insecure households in 13 worst affected sub-districts (5 districts).
- Provision of about 0.2 Mt of pulse/bean seeds to as many households in 13 severely affected sub-districts (5 districts).

Activity 3: Support to Integrated Pest Management (IPM)/Integrated Crop Management (ICM) Clubs (US$2.2 million)

The Government of Bangladesh (GOB) in partnership with FAO and DANIDA among others have been successfully attempting to group small and marginal farmers through farmer field schools and the IPM and more recently ICM. The latter is more holistic and covers many technical, management and marketing issues. The proposed programme envisages support to 150 ICM clubs through capacity building and provision of some farm machinery. The number of ICM clubs to be supported is very low given the scope of programme life (2 years). However, the number of ICM clubs to be supported could be revised during implementation, if appropriate.

The following interventions have been envisaged under this sub-component:

- Provision of training to 150 ICM clubs with 4,500 members in group dynamics, crop diversification, management, marketing, operation and maintenance of agricultural machinery.
- Provision of: 600 power tillers, 600 pedal threshers, 600 low lift irrigation pumps, 600 sprayers, 300 batch dryers, 300 weighing scales and moisture meters and a lump sum for repairs of existing farm machinery and the ICM club premises.

This sub-component will be implemented through partner NGOs in 5 severely affected districts in close collaboration with the community organisations, the Department of Agricultural Extension (DAE) and other stakeholders in the sector. The FA-Emergency Field Coordination Unit in collaboration with DAE will closely supervise and monitor the entire implementation process.

Activity 4: Emergency Support to Household Grain and Seed Storage (US$1.1 million)

Floods and cyclones are frequent in the target areas and most households loose their precious seeds and grains when their houses are inundated. The programme envisages the distribution of plastic drums for storing seeds and grains, which have proven to be resistant during inundation. The DAE/GOB have been promoting these facilities over the recent past, which are affordable and highly durable. The support will enable these households own a hermetic grain storage facility in which to store their household grain and preserve their seeds as well.

The programme intends to provide grain and seed storage facilities (plastic drums) to some 53,700 small and marginal farmers in 4 most affected districts. This only accounts for about 10% of the small and marginal farmers in the four districts. The plastic drums, have already been tested by the GOB and have been found technically sound and durable.

Sub-component 1: Support to Seed Sector Rehabilitation and Development (US$2 million)

The rehabilitation and further development of the seed sector in the affected area cannot be achieved within the envisaged 2-year rehabilitation period. Therefore, a 5-year programme has been considered under this sub-component to cover the southern districts. A separate programme document is presented in Annex 2, Attachment 4. Nevertheless, without the envisaged interventions in support of the seed sector, longer term and sustainable solutions may not be achieved.

(iii) Component III: Support to Livestock Rehabilitation (US$9.7 million)

Activity 1: Emergency feed and medicine supply (US$3.3 million)

- Provision of 3,906 Mt of feed to some 18,772 most vulnerable households in 13 worst affected sub-districts of 6 districts.
- Provision of emergency medication and vaccines targeting some 168,954 cattle/buffalos and 54,100 goats and sheep in 6 worst affected districts.

The Department of Livestock Services at District and sub-districts together with partner NGOs will implement this activity under the overall supervision and monitoring of FAO Emergency Field Coordination Unit.

Activity 2: Restocking poultry, goats/sheep and buffalo (US$5.8 million)

- **Poultry:** Given the spread of Avian Influenza (AI), controlled and very careful restocking has been envisaged. It is believed that rural households will restock at any cost and an uncontrolled restocking may further increase the risk of AI outbreaks. Some 5,000 trained local women breeders will be contracted to breed local poultry varieties under controlled measures following additional training to local home-based breeders. A total of 1.3 million chicken and ducks (90% chicken and 10% ducks) will be provided to 126,700 most vulnerable households in 5 worst affected districts. However, restocking is subject to negative results from active AI surveillance. In addition, the local breeders and other beneficiaries will receive training in bio-secure poultry rearing, marketing and improved management.
- **Goat and Sheep:** A total of 9,000 goats and 800 sheep (5-6 months old) will be distributed to as many households in 5 severely affected districts. Goats and sheep will be procured from other parts of the country (the North in particular) and a one-week quarantine as well as vaccination is envisaged prior to

distribution. In addition, training in improved management, feeding and marketing will also be provided to the target beneficiaries.

- **Buffalo:** Nearly 1,000 buffalos will be distributed to as many households living on marginal lands and on the coastal strips. This will be provided on an experimental basis and the numbers could be increased if the benefits are significant and capacity to increase numbers exists.

Activity 3: Support to Cold Chain System (US$37 000)

- The existing cold chain system is dysfunctional and cannot provide the necessary function. Support to increasing the capacity of the cold chain system is envisaged through the provision of necessary equipment, which will cover some 32 sub-districts in the five worst affected districts.

Activity 4: Support to livestock shelters (US$540 000)

- Improved design and some construction material along with appropriate training for cattle/buffalo-sheds will be provided to some 500 beneficiaries in the cyclone-affected areas. The impact of this is seen only through demonstration effects in the area.
- Assistance will be provided to develop some 5,000 mobile poultry cages in 5 severely affected districts. Support will be more in the form of design, training and some purchased material.
- Most households did not leave their homes since their precious livestock could not be left behind. The programme envisages the construction of 10 livestock cyclone-shelters in the areas most at risk. Reducing the risk of livestock losses requires significant numbers of shelters, the proposed number is only for demonstration purposes to be expanded further if successful and appropriate.
- Improved fodder production demonstration sites will be established in 32 sub-districts, one per sub-district to encourage improved fodder cultivation and preparation.

(iv) Component IV: Support to Forestry Rehabilitation (US$9.4 million)

Sub-component 1: Sundarbans Mangrove Forest Rehabilitation (US$3.2 million)

- The Sundarbans have a very fragile ecology and any haphazard intervention will disrupt the ecological balance with long term consequences. Therefore, a detailed monitoring is envisaged under this sub-component. This includes continuous monitoring and evaluation of the vegetation regeneration and ecosystem as well as monitoring wild-life and bio-diversity in the Sundarbans. Appropriate measures will be taken following the recommendations from the proposed M&E studies.
- The programme proposes the reconstruction of some 20 office/cyclone-shelters, replacing the buildings that have been completely destroyed and repairing some 30 damaged buildings. In addition, some of the key office sites in the Sundarbans will be equipped with improved drinking water facilities, solar energy and communication equipment, including the repair of water craft, landing stations other communication equipment for early warning and improved monitoring of the Sundarbans.

Sub-component 2: Agro-Forestry Rehabilitation (US$6.2 million)

- Training in the development and management of home-based satellite nurseries will be provided to some 4,000 women. Successful candidates will be provided with a package of purchased inputs to establish nurseries at their home gardens. A minimum price will be set (Taka 5/seedling – one year old), and if the nursery owners cannot sell above the minimum price, the programme will buy from them and distribute to institutions (schools, government offices, department of forestry for embankment, roadside and coastal plantations). Each beneficiary will be provided with inputs sufficient to raise some 2,500 seedlings of common species. In addition, some 4,000 men will be trained in tree planting and management.
- Some 500 ha of newly formed coastal lands will be planted with mangrove species that have already been tested in the area.
- Nearly 80 ha of foreshore areas, 3,000 km of road and railway sides and 300 km of embankments will be planted with appropriate species that have stood the test of time.
- A total of 9,600 square meters of new office buildings/cyclone shelters will be constructed to replace some of the severely damaged buildings and a number of other will be repaired in selected areas.
- Training will be provided to the District staff of the Department of Forestry (DFO) in improved forestry management, monitoring and evaluation. The regular refresher courses to the DFO staff have been eliminated for lack of sufficient funds.

D. SUMMARY PROGRAMME COSTS

Table 3: Summary Programme Costs, allocated funds and uncovered deficit

Summary Costs by Component and Activity								
	In '000 US $			In '000US $ Funds Committed So far by Donors			In 000s US$	
Component/ Activity	Year 1	Year 2	Total	CERF	Belgium	Swiss	Gap 1st 12 months	Uncovered Gap
I. Fisheries Component								
Emergency Input Supply to Aquaculture restocking	2,063	1,452	**3,515**		350		1,713	3,165
Capture Fisheries Rehabilitation	4,220	4,840	**9,060**	150			4,070	8,910
Other Costs/1	628	629	**1,257**				628	1,257
Sub-Total Fisheries	**6,911**	**6,921**	**13,832**	**150**	**350**	**-**	**6,411**	**13,332**
II. Agric. Component - Crops.								
Vegetable seeds/seedling	830	100	**929**	103		180	547	646
Field Crop and Fertilizers	13,045	-	**13,045**	450	650		11,945	11,945
Pulses/Bean Seeds	90	-	**90**				90	90
Non-Expendable Equipts (150 ICM Clubs)	2,644	-	**2,644**				2,644	2,644
Other Costs/2	3,499	29	**3,528**				3,499	3,528
Seed Rehab/Dev. (5-year project)		1,979	**1,979**				-	**1,979**
Sub-Total Agriculture component II	**20,108**	**2,107**	**22,215**	**553**	**650**	**180**	**18,725**	**20,832**
III. Livestock Component								
Emergency Feed and Veterinary medicine	2,902		**2,902**		235		2,667	2,667
Restocking (Poultry, goats, sheep, buffalo)	3,635	1,691	**5,326**				3,635	5,326
Support to cold chain development in 32 sub-districts	103		**103**				103	103
Assistance to improved livestock shelter	488	2	**490**				488	490
Other Costs	762	172	**934**				762	934
Sub Total	**7,889**	**1,865**	**9,754**	**-**	**235**	**-**	7,654	**9,519**
IV. Forestry Component			**-**					
Sundarband Bio-Div.&Habitat M&E.	875	339	**1,215**					
Sundarban Infrastracture Rehab.	616	1,414	**2,030**					
Agro/Social Forestry Rehab.	2,578	2,737	**5,314**					
Training Costs	407	449	**856**		10			
Sub-Total Forestry Rehab.	**4,476**	**4,939**	**9,415**		**10**		**4,466**	**9,405**
V. Implementation Support								
Contracts/LoA for NGOs, etc.				71	100			
Technical Assistance				32	75			
International Consultants + Consultants + Travel	318	252	**570**	74	180			
National Staff	125	125	**250**	25	96			
Non-Expendable Equipments (Office)	125	8	**133**		21			
General Operating Expenses	109	90	**199**	30	101			
Direct Operational Costs	3,938	1,583	**5,522**	65	182			
Sub-Total Forestry Rehab.	**4,615**	**2,058**	**6,673**	**297**	**755**		**3,563**	**5,621**
Total Prog. Costs	**43,999**	**17,891**	**61,889**	**1,000**	**2,000**	**180**	**40,819**	**58,709**

E. CONSISTENCY WITH GOVERNMENT STRATEGY ON POVERTY ALLEVIATION AND THE MILLENNIUM DEVELOPMENT GOALS (MDGS)

The Government of Bangladesh strategy on Poverty alleviation is closely related to its MDGs and consists of five main pillars.[4]

These are:

- *pro-poor economic growth* for increasing income and employment of the poor;
- *human development* of the poor for raising their capability through education, health, nutrition and social interventions;
- *women's advancement and closing of gender gaps* in development;
- *social protection* measures for the poor, especially women, against anticipated and unanticipated income/consumption shocks through targeted and other efforts;
- *participatory governance* and improving *non-material dimensions* of well-being including security, power and social inclusion by improving the performance of anti-poverty institutions and removing institutional hurdles to social mobility.

Policies and institutional actions delineated under the poverty reduction strategy will be designed to reach out to the poorest and the remote rural areas, which are vulnerable to adverse ecological processes (including *chars* [islands] and river erosion affected areas) and those with high concentrations of socially disadvantaged and marginal ethnic groups.

Similarly, the Government of Bangladesh has been engaged in developing a comprehensive food security policy since 2001. The policy was finalised and approved by the cabinet in August 2006.[5] The overall goal of the food policy is "…*to ensure a dependable food security system for all people of the country at all times*."[6]

The three main objectives of the food policy are:

1. To ensure adequate and stable supply of safe and nutritious food;
2. To enhance purchasing power of the people for increased food accessibility; and
3. To ensure adequate nutrition for all, especially women and children.

In achieving the objective one, the government has outlined its strategy as: "…*efficient and sustainable increase in food production*", through development of agriculture extension services; efficient use of water resources; availability of agricultural inputs and their efficient use; increased production of non-cereal crops (vegetables, oilseeds, pulses and fruits); and development of non-crop agriculture (poultry, livestock and fisheries), along with agriculture diversification and improved agriculture technology. Capacity building and market development are among other interventions in the national strategy. The FAO strategy is consistent with government policies on poverty reduction, food security and MDGs, in that it addresses food production in short- and mid-term, both through crop and non-crop sectors. The strategy also addresses issues related to capacity building and institution development, based on the "Build Better" approach. While closely coordinating and cooperating with the government, the strategy relies significantly on community-based approaches by working directly through community groups.

[4] Poverty Reduction Strategy Paper, Economic Relations Division, Dhaka, Bangladesh, March 2003
[5] National Food policy Capacity Strengthening Programme (NFPCSP), Website, December 2007
[6] NFPCSP, deto

F. PROGRAMME AND MISSION APPRAISAL (US$6.67 MILLION)

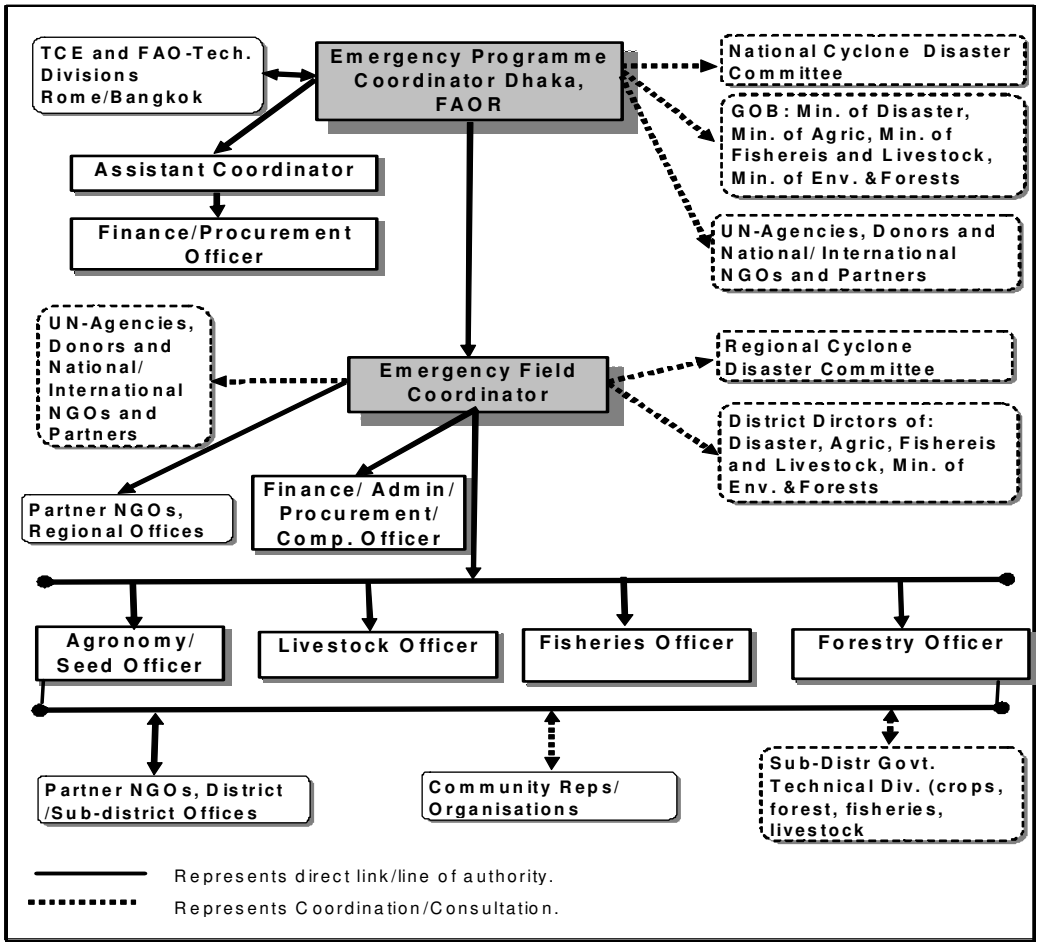
(Refer to Annex 5 for details and Component V in Table 3, Section D of this document)

F.1. Institutional Aspects

Institutional Arrangement

FAO is the implementing agency for the programme in partnership with the relevant government departments. Considering the urgency and the scope of the intervention and the geographic coverage area, it will be impossible for FAO and the government to deliver planned goods and services to the communities directly. Therefore, FAO will partner with national and/or local NGOs, who have access to almost every village for the actual delivery, under direct control and supervision of programme staff and where available government authorities. Where needed and possible, the private sector will be utilised to deliver goods and services procured by FAO to the communities. Details of institutional arrangements and the various Terms of References for individual staff are presented in Annex 5. Chart 1 below presents institutional arrangements for programme implementation and coordination.

Chart 1: FAO Emergency Programme Implementation Unit (EPIU)



National Level

A Programme Coordinator, based in Dhaka, will be responsible for the overall implementation of the programme, including management of financial and human resources. The Programme Coordinator will coordinate activities with relevant government authorities, by establishing a coordination committee with representatives of relevant departments (these will choose one representative as the focal point for the programme); with other UN agencies, the donor community and NGOs, especially FAO's partner NGOs in the programme.

District Level
A Field Coordinator, based in Barisal, will coordinate and supervise for the day-to-day activities in the field. The field coordinator will coordinate activities with relevant government authorities by establishing a coordination cell at district level, which will assign a focal point, who will be accessible and available, whenever support is required. Technical assistance will be required at district level in the four sector (to be identified) to ensure sound delivery of planned interventions. The field coordinator will be reporting directly to the Programme Coordinator in Dhaka and will liaise and coordinate all activities accordingly.

Union and Community Level
The actual delivery of programme goods and services at the community level, including beneficiary identification, will be carried out through partner NGOs, who will be contracted by FAO. These could be national or local NGOs, depending on the requirements and the scope of each individual intervention. Programme staff with support of local authorities will closely monitor NGO activities. Where possible and available, the private sector might deliver goods and services at community level for distribution through NGOs. Representatives of the Union Councils (Chair and members) will be requested for support and advice, where necessary, at Union and village levels.

F.2. Social Aspects

The proposed Emergency Rehabilitation Programme endeavours to target socially and economically disadvantaged groups in the cyclone affected areas such as: women, women-headed households, disabled, minority groups. Not only priority has been given to these groups but the choice of interventions has also been tailored to disproportionately benefit the socially and economically disadvantaged groups. A detailed analysis of the programme social aspects is presented in Annex 7.

F.3 Environmental Aspects

The cyclone affected and the proposed programme area is ecologically fragile and a relatively small imbalance in the system can create far reaching environmental and ecological consequences. Floods and cyclones have been an integral part of the agro-ecological system in the area. However, population pressure and the subsequent demand on natural resources have stretched the absorption capacity of the area to limits. In addition, changes in the flow of the main rivers due to upstream activities continue to impact the environmental and ecological make up of the Bay of Bengal delta. Some signs of change have already been noticed in the Sundarban mangrove forests, coastal areas and some newly formed islands.

The cyclone had a significant impact on the physical and environmental structure of the affected areas. Nearly 15 percent of the Sundarbans have been affected, where regeneration of mangroves have already been noticed and nature seems to be taking care of itself. Some wildlife casualties and large grazing areas for wildlife have been reported in the Sundarbans. Many drinking water ponds and wells have been inundated with sea water and polluted drinking water, food and dwellings in the area may cause disease outbreaks in livestock and humans.

The proposed Emergency Rehabilitation Programme has carefully considered the fragile ecology of the affected area and have proposed measures that will result in beneficial environmental impacts. As part of the fisheries rehabilitation efforts various fish and shrimp ponds/enclosures will be cleared with natural material, while the improvement in boat designs and the provision of new boats as well as training will encourage deep sea fishing. This is seen to reduce the pressure from coastal areas, which are also breeding grounds for many fish species.

The proposed interventions under the agricultural component envisages the promotion of integrated crop management (ICM) practices through ICM group formations, training and the provision of appropriate inputs. The interventions through the ICM clubs are seen to encourage environmentally friendly and sustainable agricultural practices. The amount of mineral fertilisers provided are minimal and far below the soil nutrient exports through crop production. All farmers have been using the recommended fertilisers over many years and are well acquainted with risks of the fertiliser misuse. In addition, the fertilisers are well packaged and supplied only a few days prior to application on the crops. Therefore, the health and other environmental hazards associated with fertilisers provided through the programme are minimal.

The programme encourages local species of tree plantation at homesteads, coastal belts, embankments and along the roads and railways. In addition, training and awareness raising courses are envisaged for men and women on the mix of tree plantation as well as how to manage trees. In the Sundarbans the proposed strategy is to monitor the impact of the cyclone on the ecology and biodiversity and take appropriate measures following the recommendations from the proposed monitoring and evaluation.

Therefore, the proposed Emergency Rehabilitation Programme endeavours not only to mitigate the environmental impact of the cyclone but also encourage environmentally friendly practices in the cyclone-affected area and through demonstration effects elsewhere in the country. Consequently a full-fledged environmental analysis is not necessary for the proposed rehabilitation programme. However, the monitoring and evaluation (M&E) of the Sundarbans and general M&E for all components will include basic environmental monitoring.

F.4. Monitoring and Evaluation

The programme monitoring and evaluation system consists of a set of impact/outcome indicators, derived from the programme immediate and mid-term goals and objectives to ensure effective assessment of progress and provide timely feedback for possible changes that might be required in the course of implementation due to unforeseen changes in the socio-economic context, as well as programme strategy.

Input and output indicators in each sub-sector, crops, fisheries, forestry and livestock, will enhance regular monitoring and evaluation of programme performance, including identification of potential problems and/or success. The indicators will also be used to assess results during evaluation, including beneficiary satisfaction with results.

The selection of appropriate indicators is critical to result-oriented monitoring and evaluation system. They are signs showing changes in certain conditions or results from specific interventions. They also provide evidence of the progress of the programme in achieving the objectives of the strategy.

While selecting indicators, the following criteria should be considered:

- What are the objectives of the programme?
- Who are the target groups and what are their needs and expectations?
- What changes are anticipated as a result of the programme?
- To what extent and how efficiently is the programme achieving its objectives?
- What are the criteria for judging the success of the programme?

Indicators must be appropriate in relation to immediate recovery and rehabilitation objectives of the programme. They should also include participation of stakeholders, the beneficiaries, government authorities and other relevant actors involved in the process. Indicators should be Specific; Measurable; Attainable; Relevant; and Traceable: SMART.

There are specific elements of Monitoring and Evaluation that need to be considered during the programme/programme formulation:

- Types and sources of data needed
- Methods and frequency of data collection
- Methods of data analysis
- Who will be responsible for data collection and analysis?
- Who will use the resulting information?

It is important to have baseline data when choosing output indicators. The baseline data will allow us to compare what has been there and what changes will the programme bring about.

Following these basic and principle guidelines, a set of input and output indicators have been selected for each programme component, however, while baseline data for some of the activities has been colleted from available government statistics, others are not available and requires staff in the field to find estimated data that can be compared with selected indicators.

For monitoring purpose, it is essential that programme staff provides regular and accurate data and information at each interval, compared with selected indicators to closely monitor progress and to prevent any unnecessary diversion from programme plans. Therefore, regular reporting is essential for this purpose and it is, therefore, suggested that weekly/biweekly reports are submitted during the initial stage of the implementation (first three months), especially during the time-critical phase, while monthly reports might suffice thereafter.

With regard to evaluation, the programme will carry out regular internal evaluation, for instance three-monthly; to ensure effectiveness and efficiency of programme design and where required, necessary measures can be taken. Internal evaluations will make substantial contribution to avoiding total diversion in due time, provide a platform to collate lessons learned and best practices applied.

This document has enlisted a number of input and output indicators, along with means of verification that will help the process of monitoring and evaluation. However, the programme will need to develop a set of outcome indicators for the evaluation process, using the overall objective and specific objectives of the programme and the individual programmes as the basis.

Two external evaluations are proposed for the programme, a mid-term evaluation at end of year one and a final evaluation at the end of the programme.

One of the basic characteristics of monitoring and evaluation system is to include measures to track systematically the key interventions and processes over time and space and to see how they change as a result of the programme strategy and its activities.

These will include:

- Measuring and analysing the sustainability of the intervention.
- Monitoring the implementation of the programme strategy.
- Evaluating the results of the strategy.
- Reporting and analysing the findings.

Another important element in monitoring and evaluation system is the roles and responsibilities of stakeholders, the FAO, the donors, the government and, more importantly the target communities/beneficiaries. While their inclusion in the system is vital, it is also important to feed back key messages to stakeholder groups, through regular reporting and dissemination of findings, to enable them to continuously improve their role in the effective implementation of the programme, the programme itself and its

component activities. Regular feedback and dissemination of findings will also enable all stakeholders to improve the quality of the programme delivery and to make informed judgment about the programme and to improve future programme designs and implementation processes.

Annex 8 presents M&E system indicators, to serve as a guide for a more elaborate system with detailed input/output and impact indicators to be included during implementation.

ANNEX 1

COMPONENT I: SUPPORT TO FISHERIES REHABILITATION (US$13.8 MILLION)

A. BACKGROUND

The fisheries sector is critical to livelihoods of millions of people and important to the economy of Bangladesh. There are more than 1 million full time and 11 million part time fishers, which constitutes 9% of the labour force. The annual production is estimated to 2.3 million metric tons (Fishery Statistics Yearbook 2005 -2006, Department of Fisheries). The rapidly growing aquaculture sector produces 892,000 MT, while catches in inland capture fisheries are 957,000 MT and marine fisheries 480,000 MT.

Fisheries accounted for USD 2,243 million or 6 percent to the national GDP in 2000. Fish and shrimp products are the second most important export item, representing 6% of export earnings. Shrimp exports were valued at USD 440 million in 2005 – 2006.

The annual per capita consumption of fish is approximately 11 kg and accounts for 60 – 80% of available animal protein. Fish is also an invaluable source for essential minerals, vitamins and fatty acids. Per caput consumption has, however, declined, mainly among poorer groups. In five years (1995 – 2000) the decline was 38% for the 22% poorest.

The sector is characterized by small-scale operations both in capture fisheries and aquaculture, with low productivity. Industrial operations are mainly shrimp trawlers (freezer trawlers) and shrimp processing plants, using modern technology.

B. AQUACULTURE RESOURCES

Bangladesh has vast water resources and water bodies, both natural and man-made, suitable for stock enhancement and aquaculture. This sector has developed rapidly over the last decades and aquaculture now produces some 890,000 MT/yr, that is 38% of the total fish production. This section will focus on fish pond culture and shrimp culture, the sub-sectors affected by the cyclone.

B.1. Fish culture

Pond carp polyculture, commercial intensive pond culture, small-scale and commercial cage culture are the major culture systems

The *pond carp polyculture* produces more than 600,000 MT/yr. The official statistics indicate that it has expanded with 20% per year in the last decade. The cyclone affected districts have important fish pond culture (about 38% of total cultured area and 20 % of the annual production). The main species are silver carp, rui, catla, and mrigal. Inputs, other than seed, are organic and inorganic fertilizers, and supplementary feed. The hatcheries have capacity to supply the sector.

Estimates of the total area under cultivation range from 520,390 ha (Department of Fisheries) to 1 million ha, based on a household survey by Bangladesh Bureau of Statistics), using different definitions The Fisheries Sector Review in 2003 concluded that the Department of Fisheries may underestimate the area.

Most production is from homestead ponds, in the range of 20 decimal (0.08 ha). Profitability calculations, quoted by the Fisheries Sector Review, indicate that returns both to land and labour are high, the profit margins are substantial and the production cost is low.

Family labour, often women and children are operating homestead ponds for diversification and more intensive utilisation of family labour to produce food and income.

The major risk in pond culture is loss of stock due to flooding. This occurs more or less regularly in many areas and farmers may loose a crop every 5 – 7 years. Another risk is low quality seed, resulting in high mortality and/or low growth rates. The risk for disease is low as is the risk of poaching.

Commercial intensive polyculture is not significant in the cyclone affected area.

Small scale cage culture has been promoted by NGOs to make aquaculture accessible to poor, landless groups. The cages are 1 cubic meter and costs about USD 10 each. They can be deployed in ditches, canals, ponds and seasonal water bodies. The operation is labour intensive but it may be profitable, according to the Fisheries Sector Review 2003, since the opportunity cost for the labour of women and children is low, and the price of the product high. This system may have a potential for alternative or additional livelihoods among poor landless fishing households.

B.2. Shrimp farming

Shrimp farming has spread rapidly since the 1970's. It became an attractive option because extensive polderisation. The present rate of growth is about 3%. Mainly two species are grown, the marine Penaeus monodon (Bagda), and the freshwater, Macrobrachium rosenbergii (Golda). Shrimp culture is concentrated in districts affected by the cyclone.

Shrimp was grown on 217,877 ha in 2005 – 2006, producing 85,510 MT shrimp and 42,412 MT ton fish (mainly carp).

The total number of shrimp farms was about 200,000 in 2006. Employment is significant, with approximately 170,000 full time and almost 100,000 part time equivalents. The processing factories employed some 10,000, mainly women, of which 30% were on full time basis.

Operational units have become smaller over time and the average size may now be in the order of 1 ha, with the majority of ghers (shrimp enclosures) below that figure. The reasons for the reduction in geer sizes have been disease risks, that water management regimes are more efficient on small scale, low growth rates and low profitability in extensive systems.

Shrimp farming is heavily concentrated to Khulna Divison and about 75% of all shrimp production occurs in the cyclone affected districts.

Bagda culture is mainly concentrated in Bagerhat, Satkhira and Khulna Districts. It is farmed, together with carp, as the only crop in areas where the salinity is high for 8 – 9 months of the year, and in rotation with rice in areas with lower salinity.

The geers are prepared on rice land by erecting low dikes with water depths seldom exceeding 30 cm (1 m water depth is recommended). The stocking density varies from 10 – 20,000 per ha. Other inputs are lime, urea, TSP and cow dung. Rice/wheat bran, fish meal and oil cake are used as feed inputs. The farming system is extensive

or improved extensive with an average production of 145 kg/ha/yr. Attempts to create semi-intensive and intensive systems in Bangladesh have failed.

Risks are poor water management and conflicting use of water resources. In addition the low water depth increases risk for stress and diseases, and for dewatering. Fry quality with high mortality rates and low growth rates of hatchery produced fry, and erratic and expensive supply of wild fry, are important issues.

Golda farming has expanded rapidly in Khulna, Baerghat and Satkirha Districts. The Fisheries Sector Review estimated the total number to 105,000 farms and a total of 30,000 ha under production. The average farm size is 0.28 ha, with the majority of geers much smaller. Golda is cultured together with a variety of fish species, such as rui, catla, sharputi and silver carp. Golda culture is considered to be suitable for small diversified households, since it can be combined with rice, vegetables and social forestry. Golda is stocked in May and is harvested from October to January.
The production is around 330 kg/ha/yr.

The Golda geers are prepared similarly to Bagda geers and are in the same size range and they are socked with 10,000 – 30,000 PL per ha. The hatchery production of PL is not sufficient for the sector and it relies to a large extent on wild caught fry. Other inputs are used in lesser quantities than in Badga farming; lime and TSP. Supplementary feeding is used.

C. CAPTURE FISHERIES RESOURCES

Statistical information on capture fisheries is based on projections from surveys made 10 and 20 years ago of numbers of boats and gear. Figures should therefore be used only as indicative information on the performance of the sector. There is no system for registration of fishers or for licensing of fishing vessels.

C.1. Bio-physical Characteristics

Bangladesh has a coastline of 714 km and an Exclusive Economic Zone (EEZ) of 164,000 sq. km. The hydrology of the inner parts of the Bay of Bengal is influenced by the major rivers; the Ganga, Brahmaputra and Meghna.

The eastern part of the coast has sandy beaches, while the western is part of the vast deltaic area, originally with important mangrove forests. The remaining main mangrove area, the Sundarbans, serves as a nursery ground for commercially important fish and shrimp species.

There are 475 recorded species of fin fish, 36 species of shrimp and others like cuttlefish octopus oysters and mussels and crabs. Not less than 90 fish species are commercially important. They belong to the following groups: Hilsa, Pomfret (Silver and Chinese), White grunter, Red snapper, Moonfish, Indian salmon, Hairtail, Cat fish, Croakers, Thread-fin bream, and Goat fish. Almost all shrimp species have a commercial value.

C.2. Socio-economics

Estimates of the number of fishing household in coastal districts (riverine and coastal fishers and fry collectors) vary between 450,000 and 907,000. About 45% are believed to reside in cyclone affected areas.

In this proposal the terms fishers and fishermen refers to those actually fishing, while owners of fishing assets, not fishing themselves, are referred to as owners. There is often a strong patron-client relationship between owners/traders and fishers. The central figure is the Arodtar, who may have his own capital or mobilises capital from money lenders. He controls the trade in fish and advances funds for investments and operational costs to an owner. The owner organises the fishing trips and hires a crew. The crew is usually a stable group of skilled fishers with long term relations to the owner and Arodtar.

Women's main occupation in the sector is wild shrimp fry collection in rivers and estuaries. Further, women are engaged in net-making and –repair, fish sorting, handling, and processing (both the dried fish production and shrimp processing). They are also engaged in fish and shrimp farming.

The fishers and their households belong to the poorer groups of the society. They are often landless, have no or very limited education, poor access to health services and lives in sub-standard houses, which lack basic amenities. They have often been marginalised and lost land and other means of livelihoods. Those who live on marginal lands (for example embankments) have limited opportunities besides fisheries related occupations and are extremely vulnerable to storms, tsunamis and cyclones.

C.3. Coastal and marine fisheries

There is no sharp boundary between riverine and coastal fisheries in the deltaic region. Fishers follow the migrating fish form the sea to the rivers. There is an important winter fishery in western coastal areas for dry fish production, which traditionally has been organised from the Chittagong region. There are thus two main migratory routes for fishers; one from river to the sea and back, the other in east-westerly direction.

There are four main categories of capture fisheries; fry collection, artisanal/coastal, commercial/intermediate, and industrial trawl fisheries. A fifth category, the so called "floating families/sea nomads", are essentially a part of the artisanal/coastal fisheries, but constitute a distinct group and is treated separately.

Fry collection

Shrimp fry collection is an important means of livelihoods for very poor and marginalised groups, dominated by women and children and still crucial for the shrimp culture sector. The development of hatcheries has, however, put pressure on price of fry and thus on fry collectors and the number has fallen, from a peak of some 450,000, to about 185,000.

Fry collectors use push and drag nets (with extremely small mesh sizes, "mosquito nets"), which are operated in shallow waters. In addition, small mesh set bag nets are used from non-mechanised boats in rivers. It is a destructive fishery, with one useful fry for 100 caught. The government ban from 2002 has been ineffective and fry collection is still widespread in coastal areas.

Consistent data show that a fry collector's earn Tk. 6 – 8,000 (approximately USD 100) for a season, a considerable contribution to family income.

Artisanal/coastal fishing

Artisanal/coastal fisheries are carried out in rivers, estuaries and near shore areas, mainly within 5 m depth curve or 5 km from the shore. The boats are plank built and 25 – 30 ft. They are propelled by oars and sails and have a crew of 3 – 5 fishers, depending on fishing method. The boats have no safety equipment and are built without adherence to explicit building standards.

The number of artisanal fishing vessels is uncertain. However, Department of Fisheries (Fishery Statistical Yearbook of Bangladesh, 2005 – 2006) states that there are 22,527 non-mechanised fishing boats. This number is arrived at through projections from surveys in 1987 and 1999, assuming a steady increase in numbers. Assuming that 45% of the number of coastal fishers is from the cyclone affected coastal areas, the number of non-mechanised boats in these districts, during the cyclone, should have been 10,000, plus those who had migrated to the area for the winter fishery.

The total catch of the artisanal coastal sector is 175,000 MT/yr. The main target species is Hilsa (27,000 MT/yr), besides shrimp and other fin fish.

The major fishing methods are *set bag ne*ts, (123,000 MT/yr), *gill nets* (45,700 MT/yr) and *long-lines* (2630 MT/yr). While the set bag net fishing shows signs of overexploitation with declining catch per unit effort (CPUE), both gill net and long-lie fishing, being more selective have more stable catches. Other selective gear, like trammel nets, was introduced in the eastern part of the country but has not been successful. Trammel nets could be an alternative to trawling for catch of shrimp brood stock

Commercial/intermediate sector

This sector employs planked built mechanised (inboard engines) fishing vessels, 35 – 50 feet. In 1967-68 there were 40 motorized boats and by 2005 some 25,000 (some sources mention 23,000). The boats have a crew of 10 – 20, depending on size and fishing method.

The total catch from this segment is more than 250,000 MT/yr. The major part, 170,000 MT is Hilsa,.

The most important gear is *gill nets* with approximately 19,000 mechanised boats involved. The main target species is Hilsa. The total catch is 218,000 MTt/yr. This fishery has rather stable CPUEs. About 1000 mechanised boats are engaged in *set bag net fishing,* catching 30,000 MT/yr. This fishery shows declining CPUEs and there is need for effort limitations. *Long line fishing* is less important, employing about 1,300 boats and producing 11,800 MT/yr.

Industrial fisheries

Entry to this sector is limited through a licensing system. The total fleet is 122 vessels of which 42 are shrimp and 80 finfish trawlers. The shrimp trawlers produce 3,370 MT shrimp per year and land in addition 3,500 MT fin fish. They are 20 – 45 m loa and use outriggers and two to four nets at a time. The mesh size in the cod-ends is 45 mm and the headrope 15 – 26 m. The fish trawlers are 28 – 30 m loa and operate single trawls with 60 mm cod end mesh size. They produce 27,000 MT/yr of mixed species,at is recorded as "other marine fish" (23,000 MT). Other target species are Bombay Duck, Pomfret, Jew Fish, and Cat Fish.

Most trawlers are equipped with modern navigation, communications and fish finding instruments.

Trawlers are allowed to operate only outside the 40 m depth curve, a limitation which has not been effectively enforced.

The shrimp stocks show clear signs of overexploitation with declining CPUEs and changes in catch composition.

Floating families/sea nomads

Floating families/sea nomads is a largely unknown group, which spends their entire life on their boats and have no land based house or registration. They operate oar and sail propelled small (25 – 30 ft) wooden boats and fish with longlines and gill nets.

They are nomads and migrate, following the fish and weather conditions. During the relatively calm winter months they tend to move towards the Bay of Bengal, while they withdrawn north into rivers and canals when summer and rougher weather comes. Little is known about their numbers and way of life.

D. INSTITUTIONS

Ministry of Fisheries and Livestock has the formal responsibility for the sector. Other ministries playing important roles are Ministry of Environment, Ministry of Land, and Ministry of Law.

The Department of Fisheries is the executing agency for government policies and strategies and is responsible for the enforcement of the Fisheries Act. Its mandate is to support enhancement of production, poverty alleviation, fulfilling the demand for animal protein in the diet, achieving economic growth (through foreign currency from export) and maintaining ecological balance, conserve biodiversity, and ensuring public health and recreation. The department has offices on divisional, district and Upazila levels (464 Upazila offices, manned by an Upazila Fisheries Officer, assisted by an Assistant Fisheries Officer and Field Assistant. The Upazila officers have limited mobility and operational funds.

The Bangladesh Fisheries Development Corporation (BFDC) has set up landing centres, markets and also fish meal plants (not in operation) and is running a fleet of six trawlers. BFDC also runs ship yards and has provisions for training of fishers. The corporation runs at a loss and at times in competition with the private sector.

Bangladesh Fisheries Research Institute (BFRI) was established in 1964. It has focused on fisheries (aquaculture and capture fisheries) research and development. BFRI has a large infrastructure in terms of research institutions and stations, but limited operational funding.

The NGO sector has significant experiences from the fisheries sector and natural resources management. The main NGOs are BCAS (research and studies), BRAC, CARE, Caritas and CNRS. Many NGOs have experiences of aquaculture development promotion and social mobilization for community based fisheries management. A few, such as CODEC, have worked specifically on issues related to coastal fishing communities. There are also NGOs which have focused on human rights advocacy and environment in shrimp farming areas.

Fishermen's associations exist on different levels, often Union based, representing owners of fishing assets. There are shrimp farmer associations, depot owners' associations as well as processor organisations (Bangladesh Frozen Foods Association, is a strong lobby organisation). The shrimp sector is better organised than the capture and fish farming sectors.

There are some 450 active community based organisations for inland capture fisheries management. Experiences are limited with regard to community organisations for coastal fisheries. Community organisations are also being established for aquaculture, following the pattern of IPM Clubs and Farmer Field Schools.

The private sector is driving the development in aquaculture and industrial fisheries. Private sector involvement has gradually increased and in practice taken over the hatchery sector, feed and fertiliser supply, as well as boat building and net making.

Marketing is diversified. In some areas there are well developed auctions for catches from capture fisheries. Often the fishers are tied to one trader (Arodtar) through the patron-client relations described earlier. The marketing chain, also for aquaculture products, is characterised by several middle men. The Fisheries Sector Review concluded, however, that the markets were rather well functioning and that they guarantee a fair price to the producers.

Credit is mainly provided through informal channels, where the patron-client relationships, guarantee supply of sufficient funds for investments and operations. Formal finance is found mainly in industrial fisheries and shrimp industry, where processing plants are being built with bank loans. Micro-credit is provided by numerous NGOs. It is however believed that micro-credit does not reach the poorer groups, as capture fishermen. Small-scale fish farmers have better access.

E. LEGAL FRAMEWORK

The protection and Conservation of Fish Act 1950 has provisions for regulations of gear, minimum sizes of landed fish, prohibited fishing methods, seasonal and geographical bans.

The Bengal Tanks Improvement Act 1939 regulates the use of water bodies, including those for irrigation and fish culture.

The Marine Fisheries Ordinance 1983 regulates licensing systems, marine fishing operations (zoning), foreign fishing in Bangladesh and the establishment of marine reserves.

The Fish and Fish Products (Inspection and Quality Control) Ordinance 1997, regulates the quality control for the shrimp industry.

In addition the environmental laws and maritime laws and regulations for the construction and safety of ships are relevant for the sector.

F. MEDIUM AND LONG TERM DEVELOPMENT ISSUES

The Poverty Reduction Strategy and the National Fisheries Strategy (2006) emphasise poverty reduction, conservation of resources and the environment, while promoting increased production in fish and shrimp farming. The Ministry of Fisheries and Livestock has initiated a revision of the National Fisheries Policy from 1998 to reflect changes in approaches.

In capture fisheries the open access regime leads to an ever increasing fishing effort, unplanned development, and clear signs of over fishing. The Government strategy is to bring all capture fisheries under a licensing system, create exclusive zones for fishing operations reserving substantial resources for the small-scale sector. A longer term aim is to reduce fishing effort on near shore resources by increased mobility of the artisanal fleet and improved selectivity of gear, simultaneously with the phasing out of small mesh size set bag nets. Collection of wild fry for the shrimp sector should be phased out, while giving due attention to livelihood issues.
Lack of data and information on the sector (number of fishers, boats and gear as well as the status of fish stocks) render fisheries management plans ineffective. The strategy advocates strengthening of the fisheries information and stock assessment systems.

Safety at sea is an important issue, with many fishers and boats lost every year in storms. This issue will be addressed through improved design of fishing vessels, better communication and safety equipment, as well as awareness building. A FAO programme with regional activities has been initiated in support of improved safety at sea.

Major issues in aquaculture are the unplanned development, environmental impact, availability and quality of feed, seed quality and quality of the final product. The Government strategy emphasises the need to introduce certification of hatcheries together with training for improved seed quality, zoning and environmental impact assessment for major developments, and systems for quality assurance (which would include safe food, environment and human and labour rights) and traceability both for the international and domestic markets for shrimp products. The Government is supported by the European Union and Denmark in improving quality control and to establish a traceability system for the shrimp industry.

G. CYCLONE DAMAGE ASSESSMENT

G.1. Methodology

The mission visited eight districts and made spot checks in fishing settlements, fish landing and processing centres as well as fish ponds and shrimp ghers. On each location discussions were held with key informants, fisher families and aquaculture operators. Discussions were also held with Upazila Fisheries Officers and, when applicable, Union Parishad Members.

The outcome of the field visits were cross-checked with estimates of damage done by Department of Fisheries.

One weakness in the assessment of damage to capture fisheries is that there is no register or license system for fishers or fishing. There is thus no baseline with which to compare reported damage.

G.2. Aquaculture

Aquaculture was affected in two ways, through inundation and falling trees. In areas that were inundated, most of the crop escaped. In areas with strong wind speed falling trees and branches physically damaged ponds and de-oxygenation killed most of the crop. De-oxygenation makes ponds unusable until the water quality has been restored.

The mission estimated that 80% of the Bagda, 60% of Golda and 10% of fish (mainly carp) had been harvested prior to the cyclone. Further it made the following

assumptions, based on observations in the field: in severely affected Upazilhas about 60% of geers had been affected as well as 85% of fish ponds. In moderately affected Upazilhas these figures were estimated to 40 and 75% respectively. These assumptions have been made to compile the table below. Physical damage to fish ponds and ghers were limited and repairs would mainly fall in the category of annual maintenance and pond preparation for next stocking. The mission concluded that no special support to rehabilitation was required. In households with limited labour (for example female headed households, the mission proposed that needs would be linked to WFP cash and food for work programmes. Table 2 presents damage estimates to the aquaculture sector.

Table 2: Damages to the Aquaculture Sector

District	Damaged Shrimp Geers		Damaged Fish Ponds	
	Area	MT*	Area	MT*
Khulna	181	70	21	52
Satkirha	214	84	14	35
Bagerhat	23000	9016	2400	5976
Jhalokati	15	6	1955	4868
Pirojpur	1472	577	3565	8877
Bhola	52	20	149	371
Barguna	280	110	3905	9724
Patuakhali	1780	698	6850	17057
Gopalganj	2	0,8	45	112
Moniganj	0	0	0	
Barisal	72	28	3812	9492
Total	**27068**	**10609,8**	**22716**	**56564**

* Expected annual production according to FRSS.
The mission estimated that, 80% Bagda, 60% Golda and 10% Carp, was harvested before the cyclone.

Production loss:	Carp	51000 MT
	Bagda	2120 MT
	Golda	1600 MT

The number of affected farms was calculated using average geer and pond sizes as provided to the mission. The number of affected pond fish farms was estimated to approximately 208,000, while 16,000 Bagda and 38,000 Golda farms were affected.

The main concentration of hatcheries were unaffected by the cyclone and the mission concludes that there was no significant impact on production of seed.

There was damage to embankments in polders, which require immediate repairs to allow proper water management for shrimp farming.

G.3. Capture fisheries

The Department of Fisheries has reported the loss of boats and gear as follows:

Table 1: Damage to capture fisheries

Division	Fishing vessels		Total	Gear***
	MB*	NMB**		
Khulna	25	36	61	3
Satkhira	0	0	0	0
Bagerhat	6	247	253	0
Barisal	0	na	0	0
Jhalkati	na	na	288	0
Pirojpur	na	na	1149	2373
Bhola	na	na	305	0
Barguna	na	na	705	0
Patuakhali	na	na	0	0
Gopalganj	na	na	0	0
Munsigajn	na	na	0	
Total	1295	591	2761	2467

In addition 1219 boats are reported as partially damaged
* MB - Mechanized boats
**NMB - Non-mechanized boats
*** Behundi nets (set bag nets) and gill nets
Note that figures do not add up in the table. In some cases loss has been given only as value, not quantity

The department has stated that that the figures may underestimate the damage, in first hand to smaller artisanal fishing vessels and fishing gear. It is not possible to accurately estimate the total number of fishing vessels operating in the affected areas at the time of the cyclone. Further, catch statistics are not divided by district for marine fisheries. The total loss of catch is not possible to estimate accurately.

The mission concludes that has been extensive damage to and loss of fishing vessels and fishing gear. The most affected categories of vessels are non-motorized fishing boats, 30 – 30 ft and the smaller range of motorized boats, 35 - 40 ft. No damage has been reported to the trawler fleet. It also concludes that there is need for updated data on numbers of fishers, fishing vessels and fishing gear in coastal districts.

There have been minor damages to landing and market places and the marketing system is intact and in operation in places visited by the mission (they were however operating far below normal, in some areas at about 25% of normal). Road communications were damaged but had been restored to most fish market places. There was no report that ice production had been severely hampered by the cyclone – ice production was resumed when electricity was back.

G.4. Fisheries infrastructure

Three government seed multiplication farms of the Department of Fisheries were damaged. The boundary walls of several more farms were also damaged. The Department of Fisheries has estimated total value of losses in the fisheries infrastructure at about Tk.13000000.

H. SUB-COMPONENT 1: AQUACULTURE (US$3.8 MILLION)

H.1. Supply of aquaculture inputs

Objective: Restocking of 36,000 carp ponds and 8,300 Golda and 6,000 Bagda ghers by June/July 2009.

Poor farmers (both carp and shrimp farming households) do not have the resources to stock their ponds and geers in time for the next season. The stocking of Bagda juveniles starts in February, followed by Golda and carp and should be concluded by June/July. It is envisaged that not all ponds and geers will be ready for stocking the season February – June/July 2008 and provision is made for stocking of such ponds also in 2009. Households are responsible for preparation of the ponds and geers before stocking. Female headed houses and households with lack of labour may require support with pond and geer preparation through cash/food for work programmes (WWF).

NGOs will be responsible for the selection of beneficiaries, using the following the criteria:

- small holders are eligible for support;
- female headed households should be given priority;
- households receiving aquaculture inputs from other sources are not eligible for support; and
- households receiving remittances from outside the district are not eligible for support.

NGOs will follow a participatory approach to beneficiary selection using PRA tools to prepare beneficiary lists. NGOs will be responsible for the distribution of the packages to approved beneficiaries and monitoring and reporting on inputs and outputs, as follows:

- to what extent beneficiaries meet the criteria for selection; and
- number of ponds in operation six months after stocking.

Packages, or contents of packages, will be delivered by the suppliers to the Upazila, where the NGO will receive the inputs for distribution to farmers.

Packages will be procured through tenders as per FAO's procurement rules. Each package will consist of seed (carp, Bagda or Golda), lime, feed and fertilizer. Specification of each package is provided in Appendix 1, Tables 1-5. However, these specifications will be revised and a detailed technical specification will be provided prior to procurement.

The contents of the packages are:

Table 5: Content of aquaculture packages*

Packages**	Seed (No.)	Feed (Kg)	Fertilizers (Kg)	Lime (Kg)
Carp	800	30	5	30
Golda	800	40	5	20
Bagda	2400	40	5	20

** Detailed specifications in Annex 1*

*** Calculated for 20 decimal pond or gher.*

The programme will provide packages as indicated in Table 6. The targeting follows the number of ponds and ghers, which have been damaged see Table 2. The support in Barguna and Patuakhali from Agriculture Sector Programme Support, Phase II, has been considered in determining the number of beneficiaries in these districts.

Table 6: Distribution of Aquaculture Inputs

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District	Carp Culture		Golda culture		Bagda culture	
	No of Upazilas	**No of Packages**	**No of Upazilas**	**No of packages**	**No of Upazilas**	**No of packages**
Bagerhat	6	5000	2	7200	2	2400
Pirojpur	5	8000	2	400	2	1300
Barguna*	5	5000	1	200	1	400
Patuakhali*	6	7000	3	500	3	1900
Barisal	5	7000	0	0	0	0
Jhalokathi	4	4000	0	0	0	0
Total		**36000**		**8300**		**6000**

** Agriculture Sector Support Programme, Phase II, will provide support for rehabilitation to its present beneficiaries in Barguna and Patuakhali. Numbers have been reduced to reflect this support.*

The distribution of packages will follow the culture cycle, starting with Bagda, in February – March and ending with distribution of carp packages in June - July. NGOs will, as part of their role in distributing, also follow up and supervise the use of the packages. There will also be an assessment, by NGOs, of performance of the beneficiaries after six months.

Table 7: Time schedule for distribution of aquaculture inputs

Packages	2008			2009		
	Feb-Mar	Apr-May	Jun-Jul	Feb-Mar	Apr-May	Jun-Jul
Bagda	4000			2000		16000
Golda		5000			3300	
Carp			20000			16000

Training will be provided to a limited number of beneficiaries during the implementation. The one-day training course will be held at pond/geer site and focus mainly on farm management, stocking densities, water quality and feeding. The courses will be held as per the schedule in Table 8. NGOs will organise the training with Upazila Fisheries Officers and Department of Fisheries Departmental Trainers as resource persons. At Least 30% of the selected trainees should be women. All trainees should be small holders. Training courses will be held in all Upazilas, receiving inputs and the number of training courses is proportional to the number of beneficiaries and content of the training adjusted to type of package, which has been distributed.

Table 8: Training courses in aquaculture*

District	2008			2009			Total
	Feb-Mar	Apr-May	Jun-July	Feb-Mar	Apr-May	Jun-Jul	
Bagerhat	6	14	12	3	9	7	51
Pirojpur	4	2	15	2	1	15	39
Barguna*	2	2	12	1	1	6	24
Pathuakhali*	4	2	15	2	2	15	40
Barisal	0	0	15	0	0	15	30
Jhalokathi	0	0	11	0	0	5	16
Total	**16**	**20**	**80**	**8**	**13**	**63**	**200**

* One-day training course for 25 participants

Feb - Mar	Training for Bagda farmers
Apr-May	Training for Golda faermers
Jun-Jul	Training for Carp farmers

I. SUB-COMPONENT 2: CAPTURE FISHERIES (US$10 MILLION)

I.1. Survey of coastal fisheries and floating families/sea nomads

Objective: To document the status of coastal small-scale fisheries and floating families/nomads

An improved knowledge base is essential for planning for the sector, to improve statistics and for the introduction of fisheries management measures. The data will also be crucial for the detailed planning for demonstration and introduction of improved fishing boats and gear under the proposed programme.

The programme will conduct two surveys/studies:

(i) Status of small-scale fisheries in coastal districts

An international expert will design the survey to be carried out by an NGO beginning in the first trimester. The NGO will field survey teams to gather data and centrally compile and analyse information. The survey will start during the second trimester and be finished during the third.

The survey will focus on:

- numbers of fishing households per District and Upazila;
- division of labour within the households for different categories: artisanal/coastal fisheries, commercial/intermediate fisheries, fry collection etc.;
- other characteristics of families as land holdings, housing, ownership of fishing assets;
- number of fishing vessels by category and fishing gear; and
- fishing operations documenting fishing areas and seasonality.

(ii) Floating families/ sea nomads

The international expert will assist in the design of the study in collaboration with the selected NGO for the implementation of the study.

The study will be carried out by an NGO and will focus on:

- number of floating families/sea nomads;
- way of life, beliefs and norms;
- household sizes, literacy, access to health services etc.;
- areas of concentration;
- livelihoods; and
- options for permanent settlements/diversification of occupation.

The study will start during the second trimester of the programme and be concluded within three months.

I.2. Demonstration and introduction of improved fishing vessels and selective gear for coastal fisheries

Objective: Organisation of fisher groups and distribution of 400 small and 150 medium-sized fishing vessels, benefiting 35,000 fisher households

The activity balances the need to rehabilitate livelihoods of poor fishing households with the need not to increase fishing effort, especially in the near shore areas. The programme will, while attempting to reach as many beneficiaries as possible, also consider longer term aims to increase the mobility of the coastal artisanal fishing fleet, increase the use of selective gear, improve safety and transfer ownership of assets to genuine fishers. Genuine fishers and their community organisations will be the ultimate owners of the assets.

The criteria for selection of beneficiaries include:

- fishers belonging to established fishing groups;
- landless fishers will be given priority;
- fishers from female headed households will be given priority;
- households, which do not receive fishing assets from other sources are legible for support; and
- fishers, who do not receive remittances from outside th district are legible for support.

The programme will work with fishing groups and community organisations (CBOs). Membership in these organisations will be restricted to groups of fishers, who before the cyclone were fishing together on boats, which have been lost or damaged. The CBOs, will ultimately own the assets. Tentatively, ten fishing groups will constitute one CBO. Boats will be leased by the organisation to the groups on a rotational basis. The fee will be set to cover administrative costs and to create buffers for major repairs and maintenance. The details will be worked out during the initial stages of the programme.

NGOs will be contracted for selection of approximately 35,000 beneficiaries[1], for community mobilisation, distribution of assets and support to CBOs and fishing groups. They will be the guardians of the assets until the CBO has the capacity and competence to assume ownership. The NGO will provide continuous training to the groups in business management, accounting, conflict resolution etc.

Two categories of fishing boats have been chosen; the non-mechanized artisanal fishing vessels 25 – 30 ft, operating in rivers and near shore areas, and the mechanized boats 35 – 40 feet, equipped with inboard engines. Some specifications

[1] The number of beneficiaries is based on 400 smaller vessels, with a crew of 5, and 10 crews per vessel, that is 20,000 beneficiaries. For the larger vessels which totals 150 the crew is 10. With 10 groups per vessel this equals 15,000 beneficiaries. Total: 35,000

of the vessels are provided in Appendix 1, Tables 6-8. However, these specifications will be revised and a detailed technical specification will be provided prior to procurement. The present designs are:

Table 3: Technical specifications of fishing vessels

Category	Length	Breadth	Draught
	Ft	Ft	Ft
Non-mechanized	25-30	8	2
Mechanized	35 - 40	10	3

Note that the designs will be revised before introduction, although the size categories will be approximately the same. Therefore, no detailed specification is given here.

The programme will:

- prepare improved traditional designs of the two categories of vessels for demonstration and introduction (300 smaller and 90 larger) during the 3 – 5 trimester of operation. The proposed design may include motorization of smaller vessels;
- prepare new designs for coastal fishing vessels for demonstration and introduction during 2 – 4th trimester in the second year (100 smaller, 60 larger boats).

The Naval Architect (international expert) will work on the short and longer term design changes, in close collaboration with the Gear Technologist and national authorities.

In the design of the vessels, the following principles will be guiding:

- increased mobility to allow moving fishing effort to beyond the 5 m depth curve, alternatively 5 km from the shore;
- efficiency;
- improved safety for the crew;
- improved working conditions for the crew; and
- improved standards for handling catches on board.

Boats will be built by Bangladeshi boatyards, which will be contracted following FAO's procurement rules. When choosing engines preference will be given to makes, which are available in Bangladesh with established servicing and maintenance organisations.

Two training courses for boat builders (25 participants in each) will be organised by the programme. The courses will focus on the proposed design changes and how to incorporate these in the production of future boats.

The boats will be supplied with adequate amounts of selective fishing gear, in first hand gill nets. The Gear Technologist will in close collaboration with the Naval Architect and national authorities, prepare detailed specifications for gear to be introduced.

Fishing gear will be chosen following the criteria:

- selectivity;
- diversification of fishing operations; and
- efficiency.

Fishing gear will be procured locally following FAOs procurement guidelines.

The boats will be supplied with adequate safety at sea equipment. During the distribution all groups will be given basic safety at sea training, organised by the NGO and with resource persons from the Maritime Academy.

The one-day training will focus on three issues:

1. Legal framework and regulated safety equipment.
2. Communications.
3. Handling of safety equipment at sea.

Safety at sea issues in design and training will draw on experiences of the FAO project Safety at sea for Small-scale Fisheries in Developing Countries (GCP/GLO/158/SWE).

Table 4: Distribution of fishing vessels, gear and safety equipment

District	No of Upazilas	25 - 30 ft vessels		35 - 40 ft vessels	
		Year 1	Year 2	Year 1	Year 2
Bagerhat	2	30	35	5	15
Jhalkati	1	30	35	5	20
Pirojour	2	40	40	5	5
Bhola		20	10	5	5
Barguna	2	50	45	20	25
Pathuakhali	2	30	35	20	20
Total:	**9**	**200**	**200**	**60**	**90**

*Note that the distribution is preliminary, will be refined based on survey of small-scale fisheries in coastal districts

Table 4 was prepared based on damage assessments by the Department of Fisheries and the mission's observations. However, it will be refined when results are emerging from the survey to reflect more accurate estimates of damages.

Appendix 1

Specifications of fisheries inputs

Table 1. Bagda Package Specification and costs/package.

Items	Amount	Unit cost	Tk	USD
Bagda PL /1	2400	0.5	1200	18
Lime kg	20	25	500	7
Feed kg	40	57	2280	34
Fertilizer kg	5	20	100	1
Total			**4080**	**60**

Specification of Bagda

Bagda PL-15, Disease Free, Unoform Size, 10 ppt salinity in package, 85% Survival rate

Table 2. Golda Package Specification and costs/package.

Items	Amount	Unit cost	Tk	USD
Golda PL	800	7	5600	82
Lime kg	20	25	500	7
Feed kg	40	57	2280	34
Fertilizer kg	5	20	100	1
Total			**8480**	**125**

Specification of Golda

Golda PL-15, Disease Free, Unoform Size, 85% Survival

Table 3. Carp Package Specification and costs/package.

Items	Amount	Unit cost	Tk	USD
Carp fry	800	2.5	1500	22
Lime kg	30	25	750	11
Feed kg	30	37	900	13
Fertilizer kg	5	20	100	1
Total			**3250**	**48**

Carp Specification

Catla 30%, Silver Carp 20%, Rui 30%, Mrigal 20%, Free from Disease, Uniform size, Hatchery identified.

Table 4. Feed Specification In %.

	Bagda	Golda	Carp
Moisture	11	11	11
Crude protein	30-40	30-35	24-30
Fat	4	4	5.5
Fibre	6	6	6
Ash	17	17	18
Carbohydrate	22-32	27-32	29,5-35,5

Table 5. Fertiliser Specification, %.

Urea	64
TSP	32
Potash	4

Table 6. Non-mechanizd fishing vessel

Loa	25 - 30 ft	Cost, Taka	800,000
Breadth	8 ft		
Fish hold capacity	0,5 - 1 ton		
Crew	abt 5		
Plank built			
Cost	300,000 Tk		

Table 7. Mechanized fishing vessel

Loa	35 - 40 ft	Cost, Taka	1,400,000
Breadth	11 ft		
Fish hold capacity	2 - 2,5 tons		
Plank built			
Crew	10		
Inboard engine	20-30 hp		
Cost			
(a) vessel	700,000 Tk		
(b) engine	300,000 Tk		

Table 8. Gill net/1

Length/1	to fit vessel
Mesh sizes	2 - 4 inch
Yarn	210D/12
Float rope	polythene diameter 4 mm
Sinkers	

Specifications will be detailed by the proposed Gear technologist

ANNEX 2

COMPONENT II: SUPPORT TO AGRICULTURE REHABILITATION (US$22.2 MILLION)

A. BACKGROUND

Agriculture is the largest sector of the Bangladesh economy contributing about 34% of the GDP, compared to the industry sector, which contributes 16% to the GDP (2004-2005). About 60% of the total labour force is employed in Agriculture. From being a major importer of food, Bangladesh in the last few years was more or less self-sufficient in food production. However, over the last twelve months the country has suffered from a series of disasters, floods in August and September 2007, and cyclone in November 2007, which has disrupted the agricultural productivity and reduced crop yields drastically.

Jute and tea, principal sources of foreign exchange, follow rice as the most important agricultural products. Other important agricultural products are wheat, pulses (leguminous plants, such as peas, beans, and lentils), sweet potatoes, and oilseeds of various kinds, sugarcane, tobacco, and fruits such as bananas, mangoes, and pineapples.

The main component of the diet of Bangladesh population is cereals, particularly rice. Therefore, the present crop loss due to the disasters has seriously affected the people and will continue to do so, unless the government embarks on a major food importation strategy. A highly significant proportion of rice is produced in the southern zone of the country, the area that is now devastated by the cyclone SIDR, adversely disrupting the livelihood of about 8.5 million people.

The country produces up to 27 million tonnes (milled rice), grown in 3 cropping seasons, "aus", "aman" and "boro". In the past 5 years, the country has imported about 800,000 tons in average per year. And in order to satisfy domestic cereal grain requirements, the government imports about 2 million tonnes of wheat annually.

B. AGRICULTURE RESOURCE

Land: The land use pattern of the country is influenced by agro-ecology, soil physiography and climatic factors. According to the variations of these factors and agriculture potential the total land area has been classified into 30 agro-ecological zones, which are grouped into 20 major physiography units. "SIDR" has affected the districts in the "Ganges tidal floods plain" in the south west of the country.

There is a general pattern of grey, slightly calcareous, heavy soil on riverbanks and grey to dark grey, non-calcareous, heavy silt-clay in the extensive basin. Most of the topsoil is slightly acidic and some soils are neutral to mildly alkaline. General fertility level is high with medium organic matter (1.5 to 2.0 %)

Individual farmers own Land. On the basis of "land size" the farming family has been classified into five categories:

a.	Landless farmers:	10%: (farms less than 0.02 ha)
b.	Marginal farmer:	33%: (farms 0.02 – 0.2 ha)
c.	Small farmer:	37%: (farms 0.2 to 1.0 ha)
d.	Middle farmer:	16%: (farms 1.0 – 3.0 ha)
e.	Big farmer:	4%: (farms 3.0 ha and above)

Farmers engage in at least two cropping seasons in a year and in many other places three growing seasons are the norm. All these require rigorous land preparation and farmers therefore employ the use of tillage equipments, such as, power tillers and draught animal. They also employ diesel-powered threshers and rely mainly on sun for grain drying.

Majority of the farmers grow rice crops, Boro rice in November, harvested in March. Some grow Aus Rice in February, harvested in May, while the third sowing season is June for Amon Rice, which is harvested in Nov./Dec. Some farmers grow one season of rice followed by pulses/beans, while in some areas Chilies or other spices are grown before the next rice crop.

Vegetable production is common in the affected areas and is a very important source of nutrition and income. Both landless (home-gardens) and landed households grow vegetables though at a much limited scale.

C. INSTITUTIONS

C.1. Department of Agricultural Extension of the Ministry of Agriculture (DAE)

The Department of Agricultural Extension's mission is to provide efficient and effective need based extension service to all categories of farmers, to enable them to optimise their use of resources, in order to promote sustainable agricultural and socio-economic development. To achieve this mission, DAE works in the context of the new agricultural extension policy (NAEP), and it is committed to developing partnerships with research organizations and government and non-government agencies involved in extension. This department has the grass root level extension workers called Sub- Assistant Agricultural Officer (SAAO). They are the frontline staff and they work closely with the farmers.

C.2. Extension Officers: Sub Assistant Agricultural Officers (SAAOs)

The SAAOs are mainly responsible to provide extension services to farmers at village level. One of the common features in their task is the establishment of demonstration plots at private farms, introducing new varieties of seeds and new technologies. Soon after the cyclone hit the Southern regions, the SAAOs were heavily involved in the initial assessment of the crop and land damages. However, most SAAOs are overloaded and it seems very difficult for many to provide quality services to the farming communities. It is estimated that one SAAO serves some 1500-1800 farming families on average now compared with 1,000 to 1,200 farming families in 1983.

Furthermore, a systematic approach to capacity building and training will be required to encourage current staff to improve their skills and knowledge and to prepare the next generation of extension workers. A systematic capacity building approach will also address the needs of farmers in new seeds and technologies and could be implemented through existing farmers associations, such as the Integrated Pest Management (IPM) and Integrated Crop Management (ICM) clubs. Improving farmers' capacities and skills in appropriate farming approaches and marketing systems will help reduce their dependency on middlemen for agriculture supplies and marketing.

C.3. Bangladesh Agricultural Development Corporation (BADC)

The objective of this organization is to multiply the breeder and foundation seeds, train farmers in new appropriate production technologies, as well as produce seedlings and seeds for farmers. BADC provides 7% of rice seed and 12% wheat seeds, while the rest comes from the farmers' harvests. BADC multiplies rice seeds, vegetable seeds and seeds and fruit tree saplings in its own centres around the country and supplies to farmers. It regularly conducts training programmes for farmer at its three centres

located in the cyclone-affected districts of Barisal, Barguna and Patuakhali, of which the Barisal centre is relatively better equipped for seed multiplication.

These centres are instrumental in the promotion of improved and appropriate seed varieties and have been supported by FAO in the recent past. In view of its importance, it would be highly beneficial to review these centres and is proposed to resume both financial and technical support, especially capacity building and provision of equipment in seed processing technology and seed multiplication in order to be able to effectively respond to the growing needs of farming communities and other stakeholders, including government institutions, the NGO community and the private sector involved in agriculture.

C.4. Bangladesh Rice Research Institute (BRRI)

Bangladesh Rice Research Institute (BRRI) was established in the year 1970 at Joydevpur of Gazipur District. The main objective of BRRI is to develop the high yielding varieties (HYV) of rice for different seasons and also research appropriate modern cultivation technology of rice. The institute has, so far, developed 43 HYV rice varieties and their application after field trials in the farmer's fields in different locations of the country. Two or more varieties are crossed for the development of HYV and it takes 7-10 years of breeding before the new variety can be approved.

The characteristic of HYV rice is erect, dwarf and the stem is stronger than the local varieties that help prevent logging. Most of the HYV varieties are disease resistant. The ratio of straw and rice is 1:1 by weight.

This institute has the germ plasma bank, where all the rice varieties including local varieties have been preserved. BRRI has developed18 varieties for Boro season, 12 varieties for Aus season and 22 varieties for Amon season. Some varieties can be grown in both seasons. There are some varieties, which are resistant to salinity and can be grown in the SIDR affected areas. HYV varieties make up around 66% of the total rice cultivated area. Only a few of the HYV rice is grown in the SIDR affected areas and there is sufficient room for further introduction of new varieties.

In addition to its seed research, processing and multiplication, BRRI has also developed some modern agricultural implements, like Weeder, Open Drum Power Thresher, Power Winnower and Dryer.

C.5. Integrated Pest Management club (IPM) now called Integrated Crop Management (ICP) clubs

In April 2002, supported by a DANIDA-funded project as part of an effort to strengthen plant protection initiatives, the Government of Bangladesh approved the establishment and development of Integrated Pest Management (IPM) Clubs. In the meantime, some 8000 IPM clubs have been established in 200 Upazilas around the country. Recently, many of the IPM clubs have also turned into Integrated Crop Management (ICM) clubs.

Members of the clubs are trained farmers from "Farmers Field Schools", whereby each club has between 25 and 30 members. A pre-condition for membership is attendance to at least one season of training. Each club has an Executive Body that consists of 7-10 members, including a President and a Secretary. The group members in open voting elect all members of the Executive body. Policy and similar decisions are taken in regular meetings and annual meetings are used to review the agricultural year and to plan for the next year.

Club membership also increases personal stand in the community, especially as members are seen by the communities as local leaders, accepting new initiatives, even if risky at

times. The clubs also offer their members access to loans with nominal fees, an alternative to costly loans many take from NGOs.

The overarching objective of these clubs is to increase their livelihood assets and income through improved and increased quality production. Preventive measures against pest attacks, adoption of new crop technologies and issues related to social development, are among other activities the clubs undertake.

Each club must be formally registered with the Social Welfare Department, assisted by "Strengthening Plant Protection Services Project (SPPSP) funded by DANIDA. The club income is accumulated from registration and membership fees, income generation activities; harvest profit, commercial banks; and some NGOs provide financial support, too.

D. CYCLONE DAMAGE ASSESSMENT

The mission reviewed detailed data that had been gathered in each district and sub-district by the DAE officers. The data was further verified in 8 districts through physical observation through extensive visits and random sampling of the affected fields. The team had extensive discussions with farmers by asking direct questions, followed by questionnaires for the DAE. The team also conducted rice head panicle counting exercise to cross check on the losses and to confirm the impact of the damage caused. For instance, in Barguna district, some of the plots analysed had panicles with only 10% of the grain filled up. This was attributed to the fact that when the cyclone struck on 15 November 2007, the rice crop was at its critically sensitive flowering stage of growth. Staff from the Department of Agriculture Extension (DAE) had earlier conducted a "quadrate" sampling survey, using a 5-meter by 2-meter frame size.

The overall Mission observations are as follows:

a. About 15-20% of the cereals (aman paddy) were completely washed out by the tidal waves. In areas close to the epicentre of the cyclone, much of the crops were shattered by strong winds and tidal waves, with fewer grains in panicles than expected. See Table 1 in the main report for sub-district list.
b. About 70-80% of the Boro rice still stand to be harvested with often unfilled and half filled grain except the 10% matured grains. Depending on the timing of sowing, some fields have lost less while others have lost more. For instance, where the panicles had flowered prior to the cyclone the loss is much greater, often 70-80%. Whereas fields that had been sowed later and flowers came up just after the cyclone the damage is less, even though the stems might have been broken in many cases due to strong wind and tidal waves.
c. Bananas, beetle leaf (Boroj), and papayas were almost completely damaged in some areas, while farms and households further inland have suffered less. On average, damage of the beetle nut and other trees has been estimated at about 40-50%.
d. While vegetable crops seem to be damaged by 80%, pulses were reported to have been damaged fully in most areas.

Table 1: Crop Damage in 9 Most Affected Districts

Districts	Area, 1000s Ha			Production, 1000s MT			Losses/1
	2005	2006	2007	2005	2006	2007	%
Patuakhali	333	284	281	560	555	361	35
Pirojpur	175	186	212	361	378	246	33
Bagerhat	130	144	171	271	248	188	28
Barguna	98	87	98	206	176	102	46
Jalokhati	74	80	103	167	175	141	17
Barishal	205	216	338	498	517	394	22
Khulna	171	176	258	402	449	353	17
Madaripur	83	56	185	184	179	189	(4)
Bhola	281	274	324	536	574	419	25
Total 9-Dist.	**1,550**	**1,504**	**1,970**	**3,185**	**3,250**	**2,394**	**26**

Source: District Dept. of Agric. Extension and Mission estimates for 2007.

1. Total losses(all rice) in 2007, compared with average 2005,2006.

Local rice varieties planted on or about 15th July was probably at its flowering stage and the cyclone winds have blown off the flowers, thus aborting the seed development. The HYV was grown around 15th August may have reached its milking stage when the cyclone struck. The cyclone tidal salty waters have contaminated this process of seed formation and resulted in many unfilled seeds called "empty glumes". These empty glumes were very much marked in many of the bad fields visited. It should be noted that there is variation across the cyclone-affected areas in exact period of cultivation, thus these variation are reflected in the level of damage suffered by the crops at different locations. In places where local varieties were cultivated the yield estimate was around 600 kg/ha rather than the expected 2 to 2.5 mt/ha. Patuakali, for instance, lost more of the local varieties (15,000 ha) than the HYV (BR 11 which yields 3.5 mt/ha). Many farmers will still be able to harvest some rice, as we witnessed but the quality and palatability of the milled rice when processed will be very poor. Consequently, many farmers did not seem very eager to harvest their paddies, because the harvest in some cases might be so low that it may not worth even harvesting.

Even in areas where many paddy fields still stand the quality of these grains will never be the best quality "Grade A" grains, either due to the soaking for some days in salty water or because they were contaminated by the silt in the tidal waters.

Most farmers in the highly affected areas have lost their local seed varieties for good, and those being harvested now may not germinate well, which calls for an emergency replacement of local seeds. One way to address the issue would be purchasing good quality harvested seeds from respective farmers before they would sell the harvest for food consumption.

Many farmers have also lost their seeds kept within the household; either soaked in four feet deep water for two days or got blown away by strong winds. With two preceding floods in August and September 2007 that affected some 10 million people and loss of 13% of Aus rice, the cyclone has had devastating impact on the livelihoods of the farming families.

D.1. Other Sectoral Damages

The horticultural crops suffered relatively higher damage than rice field and tree crops due to their succulent nature. Vegetable crops were significantly affected by the cyclone. Damaged areas ranging from 60 to 100% were recorded in mostly affected districts. Pulses suffered about 80% damage, Beetle leaf (chewed stimulant) suffered damage of up to 80%, and Beetle nut tree (nuts chewed with the leaf stimulant) suffered about 65% damage. Many of the beetle leaf farmers are women and most pre-finance production efforts through loans.

Many of the irrigation channels are either silted or broken as a result of the tidal waves and continuous use without adequate maintenance, for instance in Patuakhali and

Jhalakhati districts. In Jhalakhati district, farmers in two Upazilas (Rajaput and Khatalia) are not able to cultivate "Boro" rice for lack of resources to repair irrigation channels.

The cyclone also washed away some embankments and will need to be re-filled before the next season in some districts. Some of the farmers in Barisal, for instance, complained about inaccessibility to irrigation water as they lack facilities to pump the water into their paddy fields or proper irrigation channels to convey water to their fields, thereby reducing the land available for "Aman" rice crop. Many of the farmers also had their power tillers and irrigation pumps damaged or soaked in salty water. The agro-processors carrying the functions of rice threshing and milling either had the roofs of their facilities blown away or the buildings washed away.

The scenario of many smallholder households is rather bleak. Many farmers have lost their food crops and the limited cash they could generate from sale of rice, vegetables, poultry and tress to repay their loans to the NGOs, landowners (from whom land had been leased) and commercial banks. Lack of cash will have serious impact on the land preparation and purchase of inputs for the next season and all lending institutions have ceased to lend money to people in the affected areas, though loan repayments have now been halted until April 2008. Many households have already embarked on asset depletion, selling whatever household items and/or leftover animals and poultry, to generate cash to feed their families. Several families were observed in almost every district, selling goats, for example, at a third of the normal price to purchase urgent food and other basic supplies.

Cattle are refusing to eat farm residues and grass, as in most areas these are covered with silt and/or are heavily salinated. In several areas, farmers were observed carrying drinking water for the cattle, while others were washing and cleaning the straw to make them edible.

E. HORTICULTURE, CEREALS AND OTHER CROP SPECIFICATIONS

The following vegetable and rice seeds as well as horticulture seedlings will be provided to some of the most vulnerable households in 4 severely affected districts. This intervention aims to enable farmers to engage in farming activities and plant for next year so to prevent destitution and reduce the need for a protracted relief operation.

Seeds: Aus Rice seed is the immediate cereal crop need. This is to be sewn in February 2008 and harvested in May 2008. Another rice crop, Amon Rice is due in June 2008 to be harvested in November 2008; it is this crop that is damaged by the cyclone.

Fertilizer: Three types of fertilizer are required immediately for growing rice successfully. These are: Urea (250kg/ha), Triple Super-phosphate (100kg/ha), and Muriate of Potash (150kg/ha) as per recommendations form the DAE.

The following areas require urgent support, some of which have not been included under the envisaged programme:

- Irrigation pumps to support growing of "Boro" rice and vegetable crops;
- Provision of new power tillers and rehabilitating damaged ones in the cyclone affected areas. Training in power tiller maintenance will also be provided;
- Processing facilities have been severely damaged in some locations and there will be need to provide some rehabilitation support to the owners (*note, this has not been considered under the current programme*);
- Support to households in provision of reliable grain and seed storage in the form of small plastic drums, which have already been tested by the DAE/GOB;

- Storage warehouses for use by IPM/ICM clubs for pool procurement of inputs, grain storage and marketing *(note, this has not been considered under the current programme);*
- Support to the IPM and ICM clubs for further development including revolving fund;
- Capacity building and equipment support to the BDAC to enhance seed development process and being able to effectively respond to the needs of the farming communities;
- Support to an efficient and effective seed sub-sector development, including the promotion of private sector, marketing and new seed variety development and the development of seed producer groups.

Common Cereal and Spices crops in the "SIDR" affected areas:

(i) Transplanted Amon (T. Amon) rice (grown June to December) - major crop destroyed by SIDR

- If we consider the land type: the low land is covered by the local varieties (LV) about 75%; and the High Yielding Varieties (HYV), 25% in medium high land.
- Among the high yielding, the popular varieties are BRRI Dhan-10 and BRRI Dhan-11; few farmer now adopting the BRRI Dhan -41 and BRRI Dhan-42. In lowland the popular varieties are Sadamota, Lalmota and Kajalshail.
- Farmers generally use the Kajalshail seed in a little highland which is 25%of the total low land. The local varieties Sadamota covers 75% of the area, which is grown in low land. Farmers like the Sadamota rice varieties (seedling height more than one feet) at the age of 50-60 days.
- Some of the Kajalshail (LV) area can be replaced by HYV, because it is relatively high land. Sadamota varieties can not be replaced by HYV, because seedling height of HYV is 6-8 inches, which is not possible to transplant in the low land where the water is more than one feet. So it is better to procure the local Sadamota rice (December 2007 to January 2008) from the less affected districts for the next year. This procured seed can be stored properly for the distribution in severely affected district in next T. Aman season.

(ii) Transplanted Aus Rice (grown between February and May)

In case of T. Aus, majority of the farmers use the HYV varieties, which are BRRI Dhan-26 and BRRI Dhan- 27. A few farmers use the local varieties i.e. Kalihatta and Benamuri. Irrigation of T. Aus is done by fractional pump in the canal i.e. by tidal water. Siltation is a problem for irrigation so de-silting is needed. In severely affected areas there is urgent need of T. Aus seed, so the seed has to be distributed by mid-February 2008.

(iii) Boro Rice (grown between November and April)

Generally, the farmers of Barguna and Bagherhat district (2 of the SIDR affected districts), do not grow Boro rice, because it is difficult to access irrigation water in this season (water table too low). In the other SIDR affected districts of Barisal region the HYV: BRRI Dhan-29, 28, 14 and 3 are under cultivation. Among the local varieties the Kali boro is popular.

HYV is grown in Barisal region on around 28,000 hectare and local varieties grown on about 23,000 hectare. Boro area can be increased if the supply of fractional irrigation pump can be ensured and inputs like seed and fertilizer are given at subsidised rate.

(iv) Other Field Crops

The pulses and beans are usually incorporated into the cropping pattern as a crop diversification and intensification farming system. They are best for farmers in the T. Aman rice important and predominant growing areas of the cyclone affected areas. Current activities revolve around the monsoon season and dependency on T. Aman rice. Increased cropping intensity can be encouraged with the planting of pulses and oil seeds in the residual moisture after harvesting T. Aman crop. The most recommended crops are Khesari (grass seed), mustard, chickpea and mung bean.

- Mugh bean / Mung bean (February to May)
- Groundnut (Oct to Feb and Feb to May)
- Chilli (Sep to May)
- Potato (Oct to Feb)
- Sweet potato (Oct to March)
- Khesari (grass seed) – planted as relay crop to T. Aman around October

F. ACTIVITY 1: SUPPORT TO HORTICULTURAL CROP REHABILITATION (US$1.1 MILLION)

F.1. Specific Objectives

- Provide support to 176,802 worst-affected landless households (about 894,010 people[1] individuals), whose livelihood (for nutrition and income generation) depends on horticultural crops propagation either within their households or on their farmlands, by procuring and distributing different varieties and types of horticultural crops for propagation to replace those washed away or destroyed by cyclone.
- Specifically support 10,391 households who have land and grow Fruit Trees horticultural crops as main farming activity (e.g. hong palm, guava, pawpaw, sapota.), with about 300,000 saplings.
- Specifically support 10,000 households who have land and whose main livelihood revolve around Banana orchard cultivation and whose crops have been seriously damaged with suitable high yielding Banana suckers of about 500,000 to replace damaged ones in the affected households;
- Specifically support 20,000 vulnerable households who grow Betel Leaf crops and whose crops were washed away or damaged with about US$400,000 of services support to enable them get back into production to earn a living;
- Specifically target 136,411 landless households, who within their homesteads undertake vegetable seed propagation or who rely on cash generated from vegetable gardening within their household for their family maintenance.

F.2. Provision of Emergency Fruit Tree Saplings

The programme intends to support an estimated 10,391 vulnerable households. The overall quantity of assorted Fruit Tree saplings to be procured under this activity will be 300,000 units. The quantities and types to be made available per recipient household (HH) depend on the beneficiary district of resident as defined in Appendix 1, Table 1.

[1] Based on an average household of 5 people.

F.3. Provision of Banana Suckers

A total of 500,000 units of Banana suckers will be procured and distributed among the poor households and those farmers that have banana farm in the targeted areas. About 50 units will be given to each of the Banana farmers, thus 10,000 farmers will be targeted. Appendix 1, Table 2 provides target districts, sub-districts and the quantities of banana suckers proposed for distribution with relevant costs.

Support to Beetle Leaf Growers: A total of 20,000 farmers, especially poor female farmers, who engage in Beetle Leaf propagation, will be targeted through this component. Table 2 below provides the target districts and sub-districts for betel leaf support. Each beneficiary household will receive US$20 worth of betel leaf vines.

Table 2: Target district and sub-districts for Betel Leaf support

Patuakhali	Pirojspur	Berguna	Bergahat
Mirjaganj	Mathabaria	Pathagata	Sarankhola
Galachipa	Bhandaria	Sadar	Morolganj
Kalapara	Kowkhali	Amtoli	Sadar
Baufal	Sadar	Bamna	Rampal
Doshmina	Shaurpkathi	Betagi	Kachua

F.4. Provision of Vegetable Seeds to Landless Households

Up to 136,411 landless farmers will receive a package containing 4 types of vegetables, adequate to grow 1 bigga (0.13ha) of land within their homestead. The vegetable seeds will be packaged in two different groups of selected vegetables. Each household will be provided with a package containing 4 vegetables, adequate to plant 1 bigga (0.18 ha) of homestead land as shown in Appendix 2, Table 2. Appendix 2, Table 1, shows the number of beneficiaries, by district and sub-district and the associated seed package costs and Table 3 provides technical specifications of the seeds.

F.5. Target beneficiaries

The programme will target the most affected households who are dependent on horticultural crop production as their key soruce of nutrition and livelihood. The beneficiaries will be selected from the four worst affected districts of Patuakhali, Barguna, Bagerhat and Pirojpur, which suffered the force of the cyclone impact (ref. Appendix 1 and 2). Priority will be given to the most vulnerable families; especially marginal and small land holding farmers, as well as landless and female-headed households.

G. ACTIVITY 2: EMERGENCY CEREAL AND PULSE SEEDS SUPPLY AND FERTILISERS PROVISION (US$15.8 MILLION)

Procure and distribute both High Yielding and Local Varieties of T. Amon seeds with accompanying fertilizers and Pulses for poor farmers to replace those washed away by the cyclone. This crop combination is ideal for crop diversification and intensive production activities, thereby reducing dependency on emergency relief assistance.

G.1. Specific Objectives

- Provide some 2,298 MT of HYV seeds and 11,491 Mt of NPK fertilisers targeting some 460,000 farmers in four severely affected districts. Each household receiving 5Kg of rice seed to enable rice cultivation in 0.13 ha (1 bigga) each.

- Provide support to 211,398 worst-affected households (about 1.1 million people[2]), whose livelihoods (for nutrition and income generation) depends on rice crops cultivation on their farmlands, by procuring and distributing some 2,698 Mt, both HYV and LV of T. Amon rice seeds to replace those washed away or destroyed by cyclone. See Appendix 3, Table 1 for more details.
- Specifically support to 211,398 households who have land and grow T. Amon with Urea (9,315 Mt), Triple Super Phosphate (TSP 2,698 Mt) and Muriate of Potash (2,698 Mt) fertilizers. See Appendix 3 for specific quantities and target sub-districts.
- Specifically distribute some 211,398 kg of pulses/bean seeds and grass pea seeds locally known as Kashari to improve the nutrition imbalance of the affected households through intercropping with Amon Rice crop. This will also improve the soil fertility and increase yield per unit area of land, thus providing more income to the households. Table 3 provides types and quantities of the recommended pulse seeds.

Table 3: Cyclone Affected Beneficiaries for Pulses/Beans Seeds

Class of Farmer	Choice of Pulses/Beans	Quantity (kg)
Marginal Farmers	Khashari	118 169
Small Farmers	Mungbean	93 229
Total		**211,398**

G.2. Target Beneficiaries

The programme will target the most affected and food insecure households who are dependent on T. Amon Rice production as the key livelihood activity. Initial estimates are at 211, 398 beneficiary farming households. The beneficiaries will be selected from the four worst affected districts of Patuakhali, Barguna, Bagerhat and Pirojpur, which suffered the brunt of the cyclone impact (ref. Appendix 3). Priority will be given to the most vulnerable families, especially marginal and small land holding farmers.

In all cases, FAO will ensure that the varieties provided are adapted to the local agro-ecology that the farmers prefer the varieties and the Ministry of Agriculture approves them. During tenders for vegetable seed procurement, a minimum standard of 80 percent germination will be required to ensure the distribution of quality seed to farmers. The seeds procured will be tested by the government seed-testing laboratory to ensure they meet or exceed Quality Declared Standards (QDS) and conform to standards for emergency seed of the national government before their distribution to beneficiaries.

H. ACTIVITY 3: SUPPORT TO INTEGRATED PEST MANAGEMENT (IPM)/ INTEGRATED CROP MANAGEMENT (ICM) CLUBS (US$2.2 MILLION)

The overall objective is to rapidly rebuild the livelihoods of some of the affected farmers that had their equipments and farm tools damaged or lost during the cyclone and the preceding floods in August/September.

The programme will enable these club members to resume their role in pioneering innovated technologies and farming systems. About 150 such clubs with some 4500 members and their respective families will benefit directly from the programme. All the equipments and warehouse provided will be owned by the Government but available for the ICM clubs to use and manage properly for their own benefit.

[2] Based on an average household sized of 5 people.

H.1. Specific Objectives

- To provide essential group dynamics training and enhance the ability of 150 ICM farmers club members of 4,500 households (22,500 individuals) to resume immediate farming activities and restoration of the agriculture based livelihoods;
- To provide each ICM farmers club with various appropriate equipments and tools to enhance their ability to carry out farming activities. Table 4 below shows a list of all equipment that will be provided to the ICM clubs. All machinery provided will be the most commonly used with reliable maintenance, spare parts and easy to operate;
- To provide training to ICM clubs in the use and maintenance of supplied machinery, sources of parts and maintenance as well as crop diversification, improved agricultural practices, soil nutrition, marketing and group dynamics.

Table 4: The Project Inputs for ICM Clubs

Items and Activities	Units Per Club	Unit Cost (US $)	Quantity	Total Cost (US $)
Power Tillers	5 units	1500	600	900,000
Threshers (Pedal Types)	4 units	100	600	60,000
Irrigation Pumps	4 units	150	600	90,000
Sprayers	4 units	100	600	60,000
Batch Dryers	2 units	500	300	150,000
Maintenance and Rehabilitation of damaged Power Tillers	Units	1000	100	100,000
Weighing Scale and Moisture Meters	2 units	200	300	60,000
Training for Group Dynamics and Use of Equipment		8	1000	8,000
Reconstruction of the ICM club premises	1 unit	1000	150	150,000
TOTAL				**1,578,000**

H. 2. Target Beneficiaries

Overall, some 22,500 individuals will benefit directly from the project. The beneficiary clubs will be selected from the four worst affected districts of Patuakhali, Barguna, Bagerhat and Pirojspur, which suffered the force of the cyclone impact (ref. Appendix 3).

I. ACTIVITY 4: EMERGENCY SUPPORT TO HOUSEHOLD GRAIN AND SEED STORAGE (US$1.1 MILLION)

Floods and cyclones are frequent in the target areas and most households loose their precious seeds and grains when their houses are inundated. The programme envisages the distribution of plastic drums for storing seeds and grains, which have proven to be resistant during inundation. The DAE/GOB have been promoting these facilities over the recent past, which are affordable and highly durable. The support will enable these households own a hermetic grain storage facility in which to store their household grain and preserve their seeds as well.

The programme intends to provide grain and seed storage facilities (plastic drums) to some 53,700 small and marginal farmers in 4 most affected districts. This only accounts for about 10% of the small and marginal farmers in the four districts. The plastic drums, have already been tested by the GOB and have been found technically sound and durable.

J. SUB-COMPONENT 1: SUPPORT TO SEED SECTOR REHABILITATION AND DEVELOPMENT (US$2 MILLION)

This sub-component envisages a 5-year implementation period to assist the process of a seed sector development in the Southern Districts of Bangladesh with enhanced role for the private sector. The proposed project also includes the development and testing of saline resistant varieties, seed marketing and production through the development of producer groups to be linked with the ICM Clubs.

In view of its scope and approach, the proposed project document is attached as Appendix 4 to this document. However, without undertaking such an approach to further develop the seeds sector, the sustainability and resilience of the agricultural sector may not be fully achieved. The following sections provide a synopsis of the proposed project.

J.1. Specific Objective

- To improve the availability and accessibility of appropriate seeds of improved varieties to cyclone affected farmers in Barisal and Khulna regions through the participatory processes in programming, implementation and development of seeds. The present proposal is designed to achieve the same.

J.2. Institutional Framework and Government Strategy

Seed production and supply is the responsibility of Bangladesh Agricultural Development Corporation (BADC) under the direction of the Ministry of Agriculture. This responsibility covers all seeds. BADC obtains breeder seed from concerned crop research institutes and multiply foundation seed for one to three generations on BADC seed farms. Contract growers under the direct supervision of BADC and inspection produce certified seed and the independent Seed Certification Agency (SCA) carries out certification**.**

Government's specific objectives are: introduce new high yielding varieties and technologies; increase production of food crop seeds on-farm to meet the local demand at reasonable price; raise productivity of crops by making available essential inputs such as seed and fertilizer of assured quality at reasonable price; and preserve the environment. There are a number of institutions involved in the seed sector development.

Seed Certification Agency (SCA): The SCA has a network of sub-offices and seed testing laboratories throughout the country. Its responsibilities cover seed certification, inspection and testing. The concept paper envisages direct involvement of SCA in community oriented participatory seed multiplication project. The SCA's role will be to:
Ensure the supply of Foundation Seed (FS) of recommended varieties; Inspect, test and approve the seed produced by communities; Provide technical support; Train the extension staff and community members in seed production techniques; Assist in the production of appropriate technical literature and messages;

Extension Service: There are extension officers at village level all over Bangladesh, the Sub Assistant Agricultural Officer (SAAO). These are responsible to work at village level and will be in direct contact of the ICM/SPG groups. A greater than usual level of innovative and closely targeted extension services need to be provided, a major portion of which should be devoted to training of farmers in their application and related procedures of seed production. Simple but important and economical technologies for selecting seeds and safeguarding them from environmental adversities, insects and other predators need to be identified and made available at no or minimal cost with training in their use. The extension service will be responsible to promote the use of seed of improved varieties and. dissemination of cultural practices of new varieties.

Bangladesh Agriculture Development Corporation (BADC): BADC's current function is to produce and supply foundation seed to the seed growers. It also produces certified and truthful level seed for sale to farmers. BADC is also responsible to provide all possible technical support to private seed sector as a development partner. As the main project partner, BADC would be requested to shift attention from quantities of seed to seed quality and more timely distribution to ICM/SPGs. In its role, the BADC will ensure: supply of foundation seed in respect of recommended varieties; pre release multiplication of outstanding varieties; a source of technical information; training in seed production and processing;

Research Institutes: will introduce new improved and high yielding varieties; make available breeder seed to BADC; publication of list of recommended varieties; lay down the standard and procedure of breeder seed production;

Integrated Crop Management/Seed Producer Groups (SPGs): their formation is based on a high commitment to self-help. The ICM/SPG will be in a special position to make a significant contribution in certified seed production and distribution. It may relieve to a greater extent the government agencies of seed supply functions. The successful ICMs/SPGs might develop a sound and profitable business in the production and distribution of seed at the end of the project.

This would be achieved by:

- Establishing required number of sustainable self-motivating community based ICM/SPGs, which will manage seed multiplication and distribution in the communities.
- Ensuring supplies of appropriate breeder seed from the research institutes for multiplication by the BADC.
- Strengthening the capacity of SCA and BADC to enable it to directly support the project.
- Strengthening of extension mechanism to develop and disseminate appropriate extension message on the importance of the quality seed of improved varieties.

ICM/SPGs will be free to choose the food crops and vegetables they wish to multiply, taking into account the benefits of each crop and the local demand. It is expected that ICM/SPGs would be able to produce enough seed of various crops to meet their own requirement and to distribute the surplus quantity to non-SPG members.

J.3. Target Beneficiaries

The project will benefit poor farmers of Khulna and Barisal regions, who have no capacity to purchase seed on commercial price and usually deprived being tail ender. Special attention will be given to the disadvantaged especially to small landholders who have suffered most during the SIDR cyclone. The use of quality seed of improved varieties of food and vegetable crops will accelerate crop production, food security and incomes in the ICM/SPGs, which will benefit from the care of human resource trained in seed production and distribution to sustain seed development activities. Other beneficiaries will be the staff of the, SCA and extension department.

J.4. Beneficiary Selection Guideline

FAO will verify beneficiary lists sourced from Government Departments and will validate those through actual field information, through its IPs or partner organisations. The actual identification of beneficiaries will be carried out through selection criteria, in consultation with relevant local authorities and in collaboration with national and international implementing partners. Selection criteria will ensure that project intervention is focused on the most vulnerable households and will be applied in a fair, transparent, equitable and

effective manner and that all supplies will be made available free of any tax, or cost to beneficiaries.

The selection criteria for project beneficiaries will include, among others:

- Access (owned, share-cropped or rented) to a plot of land;
- Families hosting cyclone-affected households;
- Poor marginal and small farmers and their families;
- The landless, vulnerable women, female headed households, widows and elderly people.

J.5. Overall Implementation Process

FAO will implement the project directly in close cooperation and coordination with relevant government departments, especially the Department of Agriculture Extension, at every level (national, regional, district and local) to ensure that the intervention compliments the national emergency response initiatives.

The Emergency Programme Coordinator in Dhaka will assume overall responsibility for the implementation of project activities and will liaise with relevant government departments. The Emergency Field Coordinator will be responsible for the actual implementation of activities. The operation will benefit from FAO's technical expertise at national, regional and headquarter levels in form of direct support and backstopping where needed.

At local/village level, partner organisations (local/national and international NGOs and where available Community-Based Organisations, such as IPM and ICM clubs) working as Implementing Partner will support the equitable and transparent verification and identification of beneficiaries, provide essential training and technical assistance where required and carry out the distribution of supplies to beneficiaries.

Appendix 1

Table 1: Fruit Trees Distribution

District	Upazilas	No. of Farmers	Quantity (units)	Cost (US$)
Patuakhali	Mirjaganj	17607	20,000	20,000
	Galachipa	41551	50,000	50,000
	Kolapara	28333	20,000	20,000
	Sadar	38514	40,000	40,000
Pirojspur	Mathabara	15962	10,000	10,000
	Bhandaria	14231	20,000	20,000
	Sadar	8090	10,000	10,000
Berguna	Pathagata	15045	20,000	20,000
	Sadar	33060	25,000	25,000
	Amtoli	31718	25,000	25,000
Bergahat	Sarankhola	8247	10,000	10,000
	Morolganj	39780	40,000	40,000
	Kashua	**10, 391**	10,000	10,000
TOTAL (US$1 per unit)			**300,000**	**300,000**

Table 2: Banana Suckers Distribution per District and Upazilas

District	Upazilas	Banana Suckers	Quantity (units)	Cost (US$)
Patuakhali	Mirjaganj	17607	30,000	15,000
	Galachipa	41551	100,000	50,000
	Kolapara	28333	40,000	20,000
	Sadar	38514	70,000	35,000
Pirojspur	Mathabara	15962	20,000	10,000
	Bhandaria	14231	20,000	10,000
	Sadar	8090	10,000	5,000
Berguna	Pathagata	15045	20,000	10,000
	Sadar	33060	50,000	25,000
	Amtoli	31718	40,000	20,000
Bergahat	Sarankhola	8247	10,000	5,000
	Morolganj	39780	80,000	40,000
	Kashua	10391	10,000	5,000
TOTAL (50 units/household)			**500,000**	**250,000**

Appendix 2

Table 1: Vegetable Seeds Distribution per District and Upazilas

District	Upazila	Landless (below 0.02ha)	Cost per Package, (US$)	Total Cost (US$)
Patuakhali	Sadar	13034	1.11	14468
	Mirzaganj	1456	0.48	699
	Dumkiquate to g	3999	1.11	4439
	Baufal	10469	0.48	5025
	Dasmina	2480	1.11	2753
	Galachipa	9944	0.48	4773
	Kalapara	4378	1.11	4860
	Sub-total	**45760**		**37016**
Pirojpur	Sadar	5345	0.48	2566
	Zianagar	2305	1.11	2559
	Kaukhali	1627	0.48	781
	Nesarabad	3500	1.11	3885
	Nazirpur	4978	0.48	2389
	Vandaria	4636	1.11	5146
	Motbaria	20334	0.48	9760
	Sub-total	**42725**		**27086**
Bagerhat	Sadar	4115	1.11	4568
	Fakirhat	3073	0.48	1475
	Mollarhat	1755	1.11	1948
	Rampal	6075	0.48	2916
	Kachua	3144	1.11	3490
	Morelganj	7355	0.48	3530
	Sarankhola	1889	1.11	2097
	Mongla	2270	0.48	1090
	Chitalmari	2727	1.11	3027
	Sub-total	**32403**		**24140**
Barguna	Sadar	2700	0.48	1296
	Amtali	5733	1.11	6364
	Betagi	3042	0.48	1460
	Bamna	580	1.11	644
	Patharghata	3468	0.48	1665
	Sub-total	**15523**		**11428**
Total		**136,411**		**99,671**

(Seed packaged in 4 vegetable types per packet)

Table 2: Vegetable Package Composition

Package 1: Landless				
Seed for Package 1				
Type of seed	**Quantity (gm.)**	**Price/gm. (Taka)**	**Total Price (Taka)**	**Total Price (US$)**
Amaranthus (Lal shak)	50	0.18	9	0.13
Sweet Gourd	10	0.4	4	0.06
Kangkong (Ghima Kolmi)	20	0.12	2.4	0.04
Water Melon	10	6	60	0.88
Total			75.4	**1.11**
Package 2: Landless				
Seed for Package 2				
Type of seed	**Quantity (gm.)**	**Price/gm. (Taka)**	**Total Price (Taka)**	**Total Price (US$)**
Spinach	200	0.08	16	0.24
Brinjal	5	2	10	0.15
Kangkong (ghima Kolmi)	20	0.12	2.4	0.04
Cucumber	2	2	4	0.06
Total			32.4	**0.48**

Table 3: Vegetable Varieties and Specification

Types	**Potential Varieties**
Water Melon	Glory (Hybrid F-1), Ocean Sugar (Hybrid F-1), Sweet Giant (Hybrid F-1)
Cucumber	
Brinjal	BARI Begun-1, BARI Begun-4, BARI Begun-5, Singnath, Kazla, Eva
Stem Amaranths	BARI Data 1, Bhutan Soft, Panna, Local improved
Red Amaranths	BARI Lalshak 1, Rakta ranga, Alta Pety, Lolita, Local Improved
Spinach	Bari Puisaka-1, Bari Puisaka-2, Madhuri, Red Pui, Monisha
Kang Kong	Bari Gimakalimi, Ever Green, LP-1

Appendix 3

Table 1: T. Amon Seed Distribution to Severely Affected Districts & Upazilas

District	Upazila	No. of small farmers	No. of marginal farmers	T. Amon Rice @ 5Kg	T. Amon Rice @5Kg
				Small Farmers	Marginal Farmers
Potuakhali	Mirgagang	7081	10526	35,405	52,630
	Galachipa	17095	24456	85,475	122,280
	Kolapara	10177	18156	50,885	90780
	Subtotal	**34353**	**53138**	**171,765**	**265,690**
Pirojpur	Motbaria	4854	9377	24270	46885
	Vandaria	3821	12141	19105	60705
	Subtotal	**8675**	**21518**	**43,375**	**107,590**
Borguna	Bamna	3559	4002	17795	20010
	Sadar	20010	13050	100050	65250
	Subtotal	**23569**	**17052**	**117845**	**85260**
Bagherhat	Morolgang	17110	22670	85550	113350
	Sarankhola	5002	3245	25010	16225
	Mongla	4520	546	22600	2730
	Subtotal	**26632**	**26461**	**133160**	**132305**
TOTAL		**93,229**	**118,169**	**449,670**	**607,500**

Table 2: Fertilizer Distribution for Small and Marginal Farmers in Upazilas

District	*Upazila	Urea (Kg)	TSP (Kg)	MoP (Kg)
		@15 Kg/head	**@5 kg**	**@5 kg**
Potuakhali	Mirgagang	262500	87500	87500
	Galachipa	621000	207000	207000
	Kolapara	400260	133420	133420
	Subtotal	**1283760**	**427920**	**427920**
Pirojpur	Motbaria	212250	70750	70750
	Bhandaria	238500	79500	79500
	Subtotal	**450750**	**150250**	**150250**
Borguna	Patharghata	225000	75000	75000
	Sadar	495000	165000	165000
	Subtotal	**720000**	**240000**	**240000**
Bagherhat	Sarankhola	123000	41000	41000
	Morolgang	594000	198000	198000
	Subtotal	**717000**	**239000**	**239000**
Total		**3,171,510**	**1,057,170**	**1,057,170**

Table 3: T. Amon Rice crops and Potential Varieties for cyclone-affected areas

Class of Farmer	T.Amon Rice Crops	Potential Varieties
Marginal Farmers	**Local Varieties**	Sadamota
	High Yielding Varieties	BRRI Dhan 10 and 11 BRRI Dhan 41 and 42
Small Farmers	**Local Varieties**	Sadamota
	High Yielding Varieties	BRRI Dhan 10 and 11 BRRI Dhan 41 and 42

Table 4: T. Amon Rice Seed and Fertilizer Requirement Costs

INPUTS	Type	Quantity (Kg)	Total Cost (US$)
T. Amon Seed	LV (75%)	792,743	792,743
	HYV (25%)	264,247	264,247
Total Rice Seed		*1,056,990*	**1,056,990**
Fertilizer	Urea	3,170,970	792,750
	TSP	1,056,990	528,500
	MoP	1,056,990	528,500
Total Fertilizer		*5,284,950*	**1,849,750**
Kacheri (Grass bean)		118,169	118,169
Mungbean		93,229	93,229
Total Pulses		*211,398*	**211,398**
Inputs Total Cost			**3,118,138**

Appendix 4

Seed Sector Rehabilitation Plan of Cyclone Sidr affected regions through Participatory Seed Production Programme of improved varieties of food and vegetables

Theme: Linking Relief to Development

Executive Summary

There is no substitute of seed. Seed is unique among the production inputs. Seeds are one of the essential inputs for crop production. They have a unique and powerful quality or property, however, which places them in a separate and very special category and requires that they be viewed quite differently from other inputs in the development process. This unique property constitutes the base of both the emergency and rehabilitation process of cyclone affected area. Seeds do not also recognize the size of holding or status of the farmer. Seeds could be described as scale neutral input in agriculture. They can be effectively and beneficially used regardless of the size of the area planted when other factors are favorable. Thus, they are equally important to all categories of the farmers of affected area.

All most all farmers in Sidr affected regions grow open pollinated/self pollinated varieties and hybrid varieties are yet to find a place in the local cropping system. Farmers use year after year seed saved from the previous crop and, therefore, seed replacement rate is very poor. Seed saving and farmer-to-farmer seed exchange are among the most ancient and ubiquitous practices in crop agriculture. In case of shortage farmers bye or barter nondescript seed available locally. This practice further contributes towards the degeneration of seed. Poor seed of degenerated disease susceptible varieties is a major cause of low yields. The improved varieties and associated practices that revolutionized crop production in agro-ecologically well-endowed areas in many countries, have had little impact in many of the resource-poor areas. They continue to lag far behind in terms of development for various reasons: non availability of the improved varieties to limited resource conditions; inadequate and/or inappropriate demonstration and promotion of improved varieties that are adapted; untimely and/or inadequate supplies of essential inputs including credit and extension services; limited start-up and/or continuing supplies of seeds of the improved varieties. Eliminating or at least lessening these reasons for the meager spin-off of benefits to small, resource-limited and cyclone affected farmers in the rehabilitation process is a formidable challenge that could be addressed in a variety of ways and from many directions. Several of these directions and ways involve a reexamination of the role of seeds in the development of progressive but sustainable crop agriculture and a reordering of goals and priorities in the improvement of seed supply systems.

Low profit of margin and uncertainty of demand make the production and marketing of open and self pollinated varieties seeds less attractive to public and private sectors alike. Private sector prefers dealing in hybrid seeds. The supply of seeds for hybrid varieties is entirely in the private sector and constitutes its most important and successful segment. It affects spread of the HYV of non hybrid varieties among the resource poor farmers.

Demand of seed of traditional and HYV varieties is always very high for restoration of agriculture after natural disasters. Enormous distress and suffering are caused by natural calamities that occur in almost every region, seemingly with increasing frequency. In agricultural communities, disruptions of farming activities and infrastructure and displacement of peoples usually mean loss of the essential supplies for farming and production of food. The land remains, but tools, and most critically, seeds for both the traditional and improved varieties used in the farming systems have usually been destroyed, eaten by humans or rendered unsuitable for planting by soaking in water, etc. In such situations two sorts of seed supplies are needed: emergency seed supplies for

immediate planting; and seed supplies to initiate the rehabilitation of seed system. Emergency seed supplies are being obtained from a variety of sources for immediate distribution by government and international relief agencies. The rehabilitation of seed sector is not just an invaluable resource for the restoration of cropping systems in the wake of calamities, it will likely be the only means of restoring them as completely and in the manner desired in a reasonable period.

The difficulties of seed development for and with the poorer farmers of the developing world are immense. Though there are several major impediments but it is a common view that a major factor constraining usage of quality seed by the poor farmers is relatively higher price than that of grain. Even though quality seed contributes to increase in yields and quality in production, higher price of seed in comparison to grain used as seed plays a crucial role in its usage by the poor farmers. Due to lack of promotional programme, high prices and consequent low demand, the uptake of self and open pollinated varieties by smallholder farmers has been low.

Majority of poor farmers in disaster affected area are still outside the existing seed programme. The enormity of problem requires an unorthodox approach in the field of seed production and distribution. It is difficult to include all the seeds at the beginning. However, seeds of self and open pollinated varieties of most important food and vegetables could be included initially. The poor farmers are a deprived class within a class. They usually use food grain as seed or sometimes barrow, barter or purchase seed from rich and well to do farmers. Inadequate flows of food and income restricts their accessibility to good quality seed of improved varieties. The main objective of the present proposal is to ensure availability of quality seed of improved varieties of food and vegetable crops along with other inputs at the door steps of farmers at reasonable price.

The solution to this problem lies in production of seed by the user itself. The project envisaged the involvement of the Integrated Crop Management (ICM) clubs in seed production and distribution among its members. In case for any reason participation of ICM is not possible then Seed Producers Group (SPG) will be setup. These clubs/groups will provide improved seed for themselves and for sale within their communities. The capacity of the Seed Certification Agency (SCA) will be increased and extension services strengthened to service smallholder groups in aspects of seed production and storage. Foundation Seed (FS) will be distributed on credit to ICMs/SPGs and they will repay with an element of interest at the end of season. Farmers will be encouraged to become the members of ICMs/SPGs and produce required quantity certified seed. It is expected that after the completion of project a significant number of ICMs/SPGs will continue seed production on commercial basis and will be able to enter into contracts with the seed companies which may include seeds of open and self pollinated varieties in their production plan in future for various reasons.

It is practically not possible to achieve desired result in a short span of time say one or two years. Unlike most other industrial products seeds cannot be produced at short notice. The handful seed received from originating plant breeder has to be multiplied as breeder and foundation seed under direct supervision of specialists before it is supplied to the farmers for certified seed production. Therefore, production programme require 3-4 years lead time before it could reach to the farmers. Even if it is presumed that only varieties which are currently being produced will be cultivated in the new areas and foundation seed from buffer stock will be made available to the communities the seeds have to be planted anywhere between six and twelve months before they are required for planting. It is, therefore, necessary that the seed growers should know 9 to 18 months before this date, the varieties and the quantity they should plant. A timeframe of four years has been kept in mind at the time of drafting this paper.

Main Objective of the proposal

The aim of the proposal is to improve the availability and accessibility of appropriate seeds of improved varieties to cyclone affected farmers in Barisal and Khulna regions through the participatory programme.
Experts are also of the view that the restoration phase in relief operations is a good time to introduce new varieties and technologies into the farming systems. The present proposal designed to achieve the same.

The overall objectives of projects would be to:

- Ensure the involvement of existing ICM in seed production. If for any reason it is not possible then formation of required number of SPGs.

- Establish linkages with major stake holders namely: DE, BADC, Certification Agency, and Research Institutes for ensuring smooth operations of all important activities such as production, processing, storage, training and marketing.

- Assist in the creation of suitable conditions for the establishment of a private sector-driven seed business by transforming most vibrant groups into commercial ventures.

- Arrange training of ICM/SPGs in seed production, processing, treating, packaging, storage, marketing, book keeping, accounting and sustainability on commercial lines.

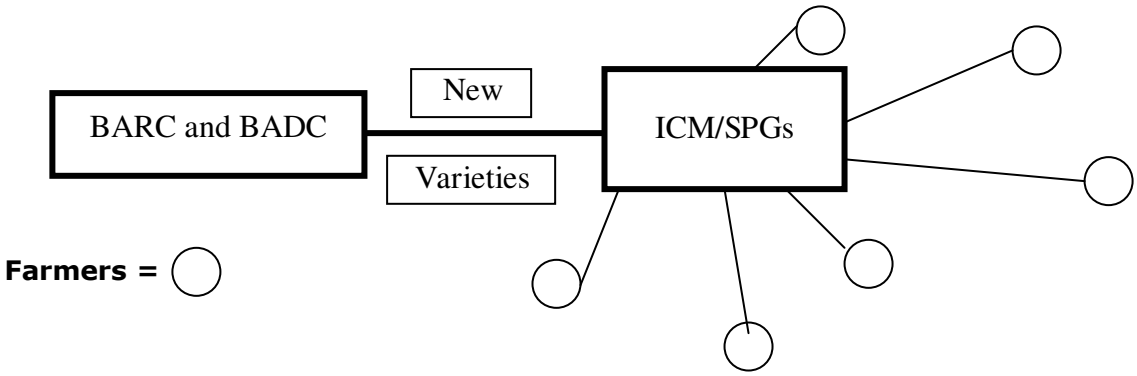
Introduction and Background

Bangladesh is one of the countries which are struggling to maintain balance between food production and ever increasing population. A slight decrease in crop productivity may cause serious social problems. Even static productivity situation is unaffordable; hence, constant increase in productivity is an absolute requirement. In 2007 the two consecutive floods in August and September and Sidr cyclone in November have seriously affected the food security. The frequent crop failure, low crop productivity, under utilization of resources, mal-nutrition and rural unemployment interlock and reinforce each other. Major portion of income is allocated for food. Therefore, increase in food production per unit area is imperative to ensure food security

National experts have also recommended that *An agricultural rehabilitation needs to be initiated immediately to generate employment and increase food production, to minimize the effect on rising food prices and household level food security.* (Hossain and Deb, 2007) No benefits result from breeding good varieties by the institutes of Bangladesh Agricultural Research Council (BARC) unless farmers obtain and plant seeds of these varieties. The farmers could quickly adopt new varieties when it is clearly advantageous and financially possible to do so. Slow spread of new varieties may create frustration not only among plant breeders but among planners, seed industry and farmers also. The net result of such a situation is very disastrous. Such a situation could be averted by spreading knowledge about improved varieties and making seed available at affordable price. Strengthening of extension programme and ensuring farmers participation in production and distribution of seed would be essential.

A simplified representation of the seed flow in the introduction and diffusion of new high yielding varieties through the Participatory Seed Production Programme is presented in Figure 1.

Figure 1: Seed flow in the introduction and diffusion of new high yielding varieties



Institutional Framework and Government Strategy

Seed production and supply is the responsibility of the government corporation BADC under the direction of the Ministry of Agriculture. This responsibility covers all seeds. BADC obtains breeder seed from concerned crop research institutes and multiply foundation seed for one to three generation on BADC seed farms. Certified seed is produced by contract growers under the direct supervision of BADC and inspection and certification is carried out by the independent Seed Certification Agency (SCA)**.**

The present Administration's development strategy and programmes are set out in various policies and plans issued time to time. In view of the importance of the agricultural sector in the economic development of the country, the Government has been making significant efforts to increase productivity in the crop sector. The Government's specific objectives could be described as follows:

- introduce new high yielding varieties and technologies;
- increase production of food crop seeds on-farm to meet the local demand at reasonable price;
- raise productivity of crops by making available essential inputs such as seed and fertilizer of assured quality at reasonable price; and
- conserve the environment.

Role of Various Institutes

Seed Certification Agency (SCA)

The SCA has a network of sub offices and seed testing laboratories throughout the country. Its responsibilities cover seed certification, inspection and testing. The concept paper envisages direct involvement of SCA in community oriented participatory seed multiplication project. The SCA's role will be to:

- Ensure the supply of Foundation Seed (FS) of recommended varieties;
- Inspect, test and approve the seed produced by communities;
- Provide technical support;
- Train the extension staff and community members in seed production techniques;
- Assist in the production of appropriate technical literature and messages;

Extension Service

The Director General through directorate is responsible for carrying out the extension services. Sub Assistant Agricultural Officer (SAAO) is responsible to work at village level and will be in direct contact of the ICM/SPG group. The only feasible way of overcoming the seed deficiencies/inadequacies related to the spread seed of new varieties is through

extension services with emphasis on training and technology. A greater than usual level of innovative and closely targeted extension services need to be provided, a major portion of which should be devoted to training of farmers in their application and related procedures of seed production. Simple but important and economical technologies for selecting seeds and safeguarding them from environmental adversities, insects and other predators need to be identified and made available at no or minimal cost with training in their use. The extension service will be responsible to promote the use of seed of improved varieties and. dissemination of cultural practices of new varieties.

Bangladesh Agriculture Development Corporation (BADC)

The BADC was formed in the year 1961 with a view to supply of Agricultural inputs among the farmers in the country like seeds, fertilizer, pumps, deep tube well for irrigation and as well as to introduce mechanical support to the cultivation. Now the main function is to produce and supply of foundation seed to the seed growers. It also produces certified and truthful level seed for sale to farmers. BADC is also responsible to provide all possible technical support to private seed sector as a development partner. The BADC seed unit would be part of the collaboration and oversight group and establish relationships and strong linkages with the ICM/SPGS who will be the entry points for replacement seeds and seeds of new varieties and the start-up of the variety diffusion. Since much less seeds will be required for the variety introduction and replacement mode, BADC would be requested to shift attention from quantities of seed to seed quality and more timely distribution to ICM/SPGs.

The BADC will ensure:

- supply of foundation seed in respect of recommended varieties;
- pre release multiplication of outstanding varieties;
- a source of technical information; and
- training in seed production and processing.

Research Institutes

- Introduction of new improved and high yielding varieties;
- make available breeder seed to BADC;
- publication of list of recommended varieties; and
- lay down the standard and procedure of breeder seed production.

Integrated Crop Management/Seed Producer Groups (SPGs)

Formation of ICM/SPG is based on a high commitment to self-help. The ICM/SPG will be in a special position to make a significant contribution in certified seed production and distribution. It may relieve to a greater extent the government agencies of seed supply functions. The successful ICMs/SPGs might develop a sound and profitable business in the production and distribution of seed by the 4th year of the project.

This would be achieved by:

- establishing required number of sustainable self-motivating community based ICM/ SPGs which will manage seed multiplication and distribution in the communities;
- ensuring supplies of appropriate breeder seed from the research institutes for multiplication by the BADC;
- strengthening the capacity of SCA and BADC to enable it to directly support the project; and
- strengthening of extension mechanism to develop and disseminate appropriate extension message on the importance of the quality seed of improved varieties.

ICM/SPGs will be free to choose the crops of food and vegetables they wish to multiply, taking into account the benefits of each crop and the local demand. It is expected that

ICM/SPGs would be able to produce enough seed of various crops for meeting their own requirement and to distribute the surplus quantity to non-SPG members.

Target Beneficiaries

The project will benefit poor farmers of Khulna and Barisal regions, who have no capacity to purchase seed on commercial price and usually deprived being tail ender. Special attention will be given to the disadvantaged especially to small land holders who have suffered most during the Sidr cyclone. The use of quality seed of improved varieties of food and vegetable crops will accelerate crop production, food security and incomes in the ICM/SPGs, which will benefit from the care of human resource trained in seed production and distribution to sustain seed development activities.

The staff of the SCA and extension department will also benefit from this intervention.

Implementation Strategy

The project will be executed by FAO through an Implementing Partner (IP) and in close collaboration with Ministry of Agriculture, particularly research institutes, BADC, SCA and Department of Extension. Effective relationships and linkages will be established between and among the principals of government and private groups, including NGO, involved in the crafting and extension of improved practices and technologies and the ICM/SPGs who would function as the "agents" of the seed production system. They will be critical for the collaborative activities involved in increased participation of the local farmers in the development process.

The project will be implemented by farmer groups with the assistance from the concerned departments of Ministry of Agriculture.

The FAO will liaise with senior officers of SCA and Department of Extension nominated by government as counterpart on seed issues. A joint action plan specifying strengthening of breeder and foundation seed production, formation of ICMs/SPGs and training programmes will be prepared.

Based on the joint action plan the IP will assist the communities to form ICM/SPGs. IP will also develop a suitable mechanism for revolving funds at community level for seed multiplication and distribution programme.

The project will include the following components:

- technical assistance in vital areas of breeder and foundation seed production;
- strengthening of SCA and Department of Extension;
- technical assistance to implementing partner;
- participatory seed production and distribution programme at community level;
- training:
  - Training on seed production technology and quality control
  - Training on Entrepreneurship Development and Business Planning
  - Training on company/ group management. Bookkeeping and accounting;
- technical back stopping.

Participatory seed production programme goes beyond the classic method of initial consultation with the target population, after which the programme designers go back to office and prepare a detailed proposal. It rather requires a mechanism to identify the requirement of seed of improved varieties and necessary arrangement to provide required

quantity of foundation and breeder seed and availability contract arrangements. In fact, it is a real bottom to top planning.

Training of the staff directly involved in implementation of the project will be conducted by experts to enhance the capabilities to communicate technology to seed growers. The NGO which has considerable experience through previous activities working with farmer groups to provide seed and fertilizer would be selected as Implementing Partner (IP). The IP has to address food security through seed security among the poorest farmers. Households receive certified seeds of food and vegetables and pay back in cash with an interest of 10-20%.

Through the formation of Integrated Crop Management Group/Seed Production Groups (SPGs), the project will produce improved seeds that will be available for distribution to farmers in the Project areas. Based on the experiences farmer groups participating in the seed development project will be free to choose the varieties of seed they wish to multiply, Flexible packages will be given, i.e., ICM/SPGs are free to choose more than one variety of seed based on land suitability and availability.

Suggested Models for Smallholder Seed Development Project

1. Based on the lessons learned, NGO will be developing appropriate mechanisms for revolving funds at community level for the Seed multiplication project.
2. ICMs/SPGs will be formed after a full process of discussion with field officers of Dept. of Extension and SCA regarding the potential for seed multiplication and in response to expressions an interest in receiving alternative varieties of seed for multiplication. The groups will choose responsible members to perform necessary functions and to share out responsibilities. NGO will attempt to ensure groups are genuinely interested and motivated to participate and are not forming purely as a result of NGO's offer of assistance. If possible, women's group will also be encouraged. At community entry the following will be taken care of:
    - Defining the problem
    - Analyzing constraints and opportunities
    - Action planning
    - Agreement of terms between IP and SPG
    - Implementation of activities
    - Review
3. The preferred mechanism for the functioning of the revolving fund is based on the concept of NGO acting as banker, i.e., providing seed on credit repayable in cash the following season. The credit funds will be provided from the budget earmarked for this purpose under the project. The cash repaid can then be used to fund the same group with further varieties of seed in a second season or for repeats of the same varieties should this be necessary. The budget lines for certified seed multiplication will form the basis for the revolving fund account.
4. In this model each group is provided a mixed package of chosen seed. Each variety of seed will be provided once and it is hoped farmer groups will be able to multiply sufficient to generate improved seed and income to assure food security and to allow them to purchase additional quality seed in future. Revolving funds will be able to extend the project annually to additional groups as a supplement to the annual donor funds.
5. Mechanisms need to be established in the initial years of the project to encourage the communities or farmer groups themselves to take responsibility for the revolving fund. The fund will be the responsibility of the farmer groups to continue supporting quality seed production and supply once NGO is no longer involved. Farmer group leaders will be linked to sources of higher classes seed during the life of the project to ensure they are able to access seed in the future. Otherwise, the scheme is not sustainable. Furthermore, NGO will not be around to receive repayments in Year 5 to collect repayments. Communities should be encouraged to hold NGO and the extension staff accountable for the monies they have collected as

this will be used to support other groups with seed. NGO will also monitor repayments made to groups outside the project and will provide technical support and back up within.

Model for Revolving Fund

Though the project life is only for four years but the model project has been proposed for five years. This is because seed production is a highly specialized activity calling for adequate technical support at all stages with an assembly-line approach. Unlike most other industrial products seeds cannot be produced at short notice. The handful seed received from originating plant breeder has to be multiplied as breeder and foundation seed under direct supervision of specialists before it is supplied to the farmers for certified seed production. Therefore, production programme require 3-4 years lead time before it could reach to the farmers. Even if it is presumed that only varieties which are currently being produced will be cultivated in the new areas and foundation seed from buffer stock will be made available to the communities the seeds have to be planted anywhere between six and twelve months before they are required for planting. It is, therefore, necessary that the seed growers should know 9 to 18 months before this date, the varieties and the quantity they should plant.

Ideally the following model will be established with ICM/SPGs:

Year	Group	Action and Commitments
Year 1 - 2008	**A**	NGO provides foundation seed variety: a, b,c, on credit
Year 2 - 2009	**A**	Repays cost of seed in cash to NGO NGO provides foundation seed varieties: d,e,f
	B	NGO provides foundation seed variety: a, b,c, on credit
Year 3 - 2010	**A**	Repays cost of seed in cash to NGO
	B	Repays cost of seed in cash to NGO NGO provides foundation seed varieties: d,e,f
	C	NGO provides foundation seed variety: a, b,c, on credit
Year 4 - 2011	**B**	Repays cost of seed in cash to NGO
	C	Repays cost of seed in cash to NGO NGO provides foundation seed varieties: d,e,f
	D	NGO provides foundation seed variety: a, b,c, on credit
Year 5 - 2012	**C**	Repays cost of seed in cash to community bank account
	D	Repays cost of seed in cash to community bank account

In this model each group is provided a mixed package of chosen seed. Groups may access each variety of seed twice if necessary although ideally they will be provided seed varieties once and will be able to multiply sufficient to generate improved seed and income to assure food security and to allow them to purchase additional foundation seed in future. Revolving funds will be able to extend the project annually to additional groups as a supplement to the annual donor funds.

In reality groups may require NGO to provide the same variety of seed in subsequent seasons as a result of poor/security, due to lack of locally available foundation seed or due to greater demand than can be met. The foundation seed and seed from the first crop will be high yielding - however in the subsequent seasons farmer groups will require repeat injections of foundation seed.

Payment for seed will be made in cash with a token interest payment. Payment in kind is not favored for this scheme as this would involve NGO with the task of dispersing the collected improved seed.

Expected End of Project Situation

At the scheduled end of the project, the process of certified seed production through ICM/ SPGs will have been set up and a sufficient number of farmers will have joined these groups. Improved confidence, collaboration and linkages between various seed institutions and poor farmers will have been built.

It is expected that a significant number of ICM/SPGs will continue seed multiplication on a commercial basis and will be able to enter into contracts with the seed companies for the continued provision of FS. It is likely that ICM/SPGs will also be able to enter into contracts with the seed companies which may include the open and self pollinated varieties in their seed plan partly as social obligation and partly due to commercial compulsion.

Marked improvement in the availability of a range of seed varieties for cyclone affected farmers has been achieved. Increased in the crop yield and consequently improved household nutrition also achieved.

Seed Sub-Component Budget

Items	Units	Unit Price	Quantities Year 1	Year 2	Year 3	Year 4	Year 5	Value in 000s US$ Year 1	Year 2	Year 3	Year 4	Year 5	Total
Expendable Equipment	LS							-	-	-	-	-	**0**
Foundation Seed and Fertilizer								25	75	100	90	-	**290**
Seed Storage Facilities for Prod. groups	LS							20	15	20			**55**
Seed treating chemical & Seed packaging (bags, labels, etc.)								9	19	28	19	-	**75**
Non Expedable Equipment	LS							145	165	30	-	-	**340**
Trainings/Workshops	LS							-	-	-	-	-	**0**
In service Training								10	10	6	4	-	**30**
Workshops	LS							3	-	2	-	-	**5**
Human Resources													
International Consultant	Months	15,000	4	4	3	3	1	60	60	45	45	15	**225**
National Consultant	Months	2,000	16	16	15	15	12	32	32	30	30	24	**148**
Admn/Finance Assistant	Months	400	12	12	12	12	12	5	5	5	5	5	**24**
Driver/Mechanic	Months	300	12	12	12	12	12	4	4	4	4	4	**18**
Travel													**0**
International Consultant	LS						0	16	12	12	12	-	**52**
Duty Travel for FAO HQ STS	LS							-	5	-	5	-	**10**
National Consultant	LS							6	5	5	5	1	**20**
Technical Support Service	LS							10	13	16	17	-	**56**
General Operating Expenses	LS							34	60	75	120	-	**288**
Support Cost (10%)								38	48	38	35	5	**164**
Sub Total								**416**	**525**	**415**	**390**	**53**	**1,799**
Physical and Price contingency 10%								42	53	41	39	5	180
Total Sub-Component Costs								**457**	**578**	**456**	**429**	**59**	**1,979**

Footnotes:

Training	**Technical Support Services**
In service training	STS from HQ/Regional Office for Asia and the Pacific
Workshops	Stand. Supervisory Tech. services of LTU (AGPS)
Expendable Equipment	Report costs
Foundation Seed and fertilizers	**General Operating Expenses**
Seed treating chemical & Seed packaging (bags, labels, etc.)	Vehicle operation and maintenance
Non-Expendable Equipment	Capital to initiate "Certified Seed RevolvingFund" (US$50/MT)
Office furniture and equipment	Miscellaneous sundries
Seed farm and laboratory equipment	Donor visibility (posters, stickers, media mtgs,etc.)
Portable Seed processing units (Three)	Reporting
Transportation equipment	Other GOE costs - Freight and insurance premium ,etc
Communications equipment	
Vehicle (one)	

ANNEX 3

COMPONENT III: SUPPORT TO LIVESTOCK REHABILITATION (US$9.7 MILLION)

A. BACKGROUND

Livestock and poultry play an important role in the economy of Bangladesh. It contributes 2.91% to the overall GDP[1], and provides 15% of total employment in the economy. The introduction of micro finance through government and NGOs in the past 20 years, along with introduction of a nation-wide vaccination programme and community-based training programmes in livestock and poultry management and development, has made a significant contribution to the growth of livestock, enabling poor households to benefit directly and/or indirectly and improving their livelihoods. As a result, livestock and poultry sub-sector has emerged as a promising dynamic area with great potential for rapid poverty reduction in Bangladesh.

According to Bangladesh Economic Review (BER) 2004, livestock growth rate in 2003-04 was the highest in the agriculture sector, at 4.48%, compared to 2.88% for crops and 2.23% for fisheries sub-sectors, indicating a steady growth in the sub-sector.

Table 1: Sectoral Growth Rate of GDP at Constant Prices
(Base Year: 1995-96)(by percentage)

Sub-Sector	1993-94	1994-95	1995-96	1996-97	1997-98	1998-99	1999-00	2000-01	2001-02	2002-03	2003-04
Crops and Vegetables	-1.66	-3.42	1.74	6.44	1.05	3.11	8.1	6.18	-2.39	2.88	1.67
Livestock	***2.42***	***2.47***	***2.51***	***2.58***	***2.64***	***2.69***	***2.74***	***2.81***	***4.7***	***4.51***	***4.48***
Fisheries	7.91	6.79	7.39	7.6	8.98	9.96	8.87	-4.53	2.22	2.23	3.64
Forestry	2.8	2.84	3.46	4.03	4.51	5.16	4.94	4.85	4.91	4.43	4.48

Source: National Livestock Policy and Action Plan-July 2006

The sale of hides and skin makes substantial contribution to Bangladesh's foreign currency earnings, with around 180 million square feet. Leather and leather products, alone, make 6-7% of the total national export revenue.

The livestock sub-sector offers considerable employment opportunities, particularly for the rural poor, providing self-employment to some 3 million rural women between 1993 and 2002[2], through small-scale livestock. Goat, chicken, and duck farming playing important role in poverty reduction and supporting national institutions to move forward with one of the vital MDGs.

Livestock products, such as milk, meat and eggs, play an important role in people's daily diet, yet current production covers less than a third of the national requirements. As a result, deficiency in protein and nutritious food products is acute in the country, especially among the rural poor with limited purchasing power.

[1] Bangladesh Economic Review (BER), 2005
[2] DANIDA, 2002 Report

B. LIVESTOCK RESOURCES

The following table shows the main livestock and poultry population in Bangladesh.

Table 2: Livestock Population in Bangladesh[3]

Type of Animals	Population during last 5 years (in million heads)				
	2001-2002	2002-2003	2003-2004	2004-2005	2005-2006
Cattle	22.46	22.53	22.60	22.67	22.80
Buffalo	0.97	1.01	1.06	1.11	1.16
Goat	16.96	17.69	18.41	19.16	19.94
Sheep	2.20	2.29	2.38	2.47	2.57
Chicken	152.24	162.44	172.63	183.45	194.82
Duck	34.67	35.54	36.40	37.28	38.07

Source: Agriculture Information Service 2007

B.1. Livestock Production System

Similar to other agricultural-based economies in the region, almost every household in rural Bangladesh has chicken flocks. Ducks are commonly found in substantial numbers along the riverbanks and marshland. Most households with small to medium farms use poultry farming as a commercial activity, investing the income to purchase goats and cattle. In addition to improved livelihoods, goats and cattle are considered important bases of household asset.

The livestock production system is unique in Bangladesh. It is mainly dependent on crop and other agro by-products. Cattle farming can be found in all sizes, depending on household income and land ownership, especially as cattle and crops are complementary to each other. Cattle and buffalo till land and provide manure to the fields whereas livestock eats crop residues. Subsequently, livestock farming and production vary from household to household, depending on their agriculture assets. However, poultry farming, especially small and medium size by poorer households doesn't require much investment in feed, as most can survive on scavenging among household and agriculture waste.

Table 3: Livestock Production System in Rural Bangladesh

	Production System	Ownership Pattern
1	Combination of Crop, Cattle, Goat, Sheep, Chicken and Duck.	Large and medium farmers
2	Combination of Vegetable, Fish, Goat, Chicken and Duck.	Medium farmers
3	Combination of Fish, Goat, Chicken and Duck.	Medium and small farmers
4	Combination of Vegetable, Chicken and Duck.	Small farmers
5	Combination of Vegetable and Chicken.	Landless people (inland)
6	Combination of Vegetable and Duck.	Landless people (riverbanks)

[3] Agriculture Information Service, 2007

C. INSTITUTIONS

C.1. Government of Bangladesh

Department of Livestock Services (DLS): Department of Livestock Services (DLS) is the main institution providing national policies and strategies in the development of livestock. It also provides nation-wide primary healthcare service down to 507 Upazilas.

DLS has two vaccine producing laboratories in Mohakhali, Dhaka and Comilla where a large variety of vaccines for livestock and poultry are produced.

The Central Cattle Breeding Station of DLS in Savar, Dhaka, undertakes limited research and extension for upgraded dairy cattle and provides relatively proven bulls to be used for further development of cattle in Bangladesh. However, Bangladesh lacks a comprehensive genetic improvement programme. In addition, the DLS has several programmes, some with assistance from the international donor community. The Regional Fisheries and Livestock Development Component (RFLDC) is one of the significant programmes operating in Barisal and Noakhali districts, in close cooperation with the Department of Fisheries. The DSL goat-rearing programme can be named as one of the significant activities that GOB/DLS is undertaking in 440 Upazilas in the country.

Bangladesh Livestock Research Institute (BLRI): Until 1984, little research was carried out on livestock, under the DSL. In 1985, the Government of Bangladesh established a semi-autonomous research centre, the Bangladesh Livestock Research Institute (BLRI). The BLRI is tasked with the following main functions:[4]

- Identify and address basic livestock issues through research and develop suitable methods for quick diagnosis and treatment of various livestock diseases;
- Develop appropriate technologies for production of suitable biologics and develop suitable breeds of livestock to increase milk, meat and egg production, as well as draught power;
- Develop approaches for improving production and preservation of fodder and feeds, and for improved utilization of agricultural by-products, wastes and non-conventional food stuff;
- Improve management and production practices that lead to improved animal and birds health and production, as well as improved processing, storage and marketing system practices; and
- Public campaign, especially among livestock farmers should enhance animal and birds health and production.

C.2. Private sector

The private sector is an important stakeholder in livestock, especially in poultry development. Poultry is an emerging industry in Bangladesh of all sizes, from small holders at household level to large-scale commercial farms. The private sector is involved in hatching (using parent stock), rearing broiler and layers, and manufacturing feeds. In 2006 and 2007 alone, the sector produced some 250 million and 281 million Day Old Chicks (DOC) for layer, respectively, plus almost 23 million tons of commercial poultry feed on annual basis.[5]

C.3. Non-Governmental Organisations (NGOs)

Since the inception of Bangladesh, National and International NGOs play an important role in the socio-economic development of the country. One of the common activities

[4] National Livestock Policy and Action Plan-July 2006
[5] Poultry Business Directory 2007

among NGOs is provision of micro finance. Almost every household, especially in the rural areas, has taken, at least, one loan from one of the NGOs and most invest their loans in the acquisition of small to medium poultry farms, chicken and ducks, and small goat rearing activities. The majority of beneficiaries in the micro finance schemes are women, who have been reported by the NGOs to be the most efficient beneficiaries in the scheme, of whom the majority invest in small-scale poultry and livestock.

D. CYCLONE DAMAGE ASSESSMENT

The SIDR cyclone damage was assessed through interviews with cyclone victims, in addition to official reports by relevant government institutions and local leaders. Statistics from respective government departments in Dhaka were used as baseline information. An initial joint assessment of the UN agencies and spot checks by NGOs confirmed the level of damage, even though they were not quantified.

According to these reports, SIDR has affected 30 districts in the Southern regions of Bangladesh, of which livestock losses were the highest in Pirojpur, Borguna, Patuakhali, Bagerhat, and Jhalkathi. The FAO team also carried out spot checks from 7th to 15th December 2007, with the aim to develop a comprehensive emergency recovery and rehabilitation programme, addressing the needs of the most vulnerable groups affected by SIDR, in close cooperation with the Government of Bangladesh.

A checklist was used to collect information on causalities of different types of livestock, animal sheds, fodders, and concentrated feeds. It was not possible to quantify the number of animals casualties. The team gathered a substantial amount of information by visiting the most severely affected areas and by talking to the affected communities.

During the visits in these areas, it was observed that the damage was very severe along the riverbanks and on the seashores, where the cyclone had hit forcefully, whereas further inland the damage was less severe. The physical assessment by the FAO team revealed that most of the small-scale livestock and poultry along riverbanks and sea embankments were washed away almost entirely, thus confirming that initial government assessments were not over-estimated, if not under-estimated in same cases.

Photo 1: Damaged village in Patharghata

Tables 4, 5, and 6 indicate clearly that chicken, ducks, goats, and sheep were the most affected species. Mostly, communities with limited livelihood assets farm these species, which reside mainly along riverbanks and sea embankments, as an additional livelihood source next to fishing.

The aftermath of the cyclone is very gloomy for livestock and their owners. There is an acute shortage of water, fodder and other feeds. Cattle, chicken, and ducks are unable to use damaged paddy fields for fodder, as those are stinky, salty and coated with silt. During the visit to the affected villages, the team witnessed farmers carrying fresh drinking water for cattle from far away places.

Table 4: Estimated Loss of Poultry in 5 Districts Assessed by the FAO Team

Poultry birds						
	Name of District	No. of Upazila	Chicken		Duck	
			Population	Death	Population	Death
1	Pirojpur	7	2715111	779738	369564	111103
2	Borguna	5	1669806	582885	467626	68333
3	Patuakhali	7	3189385	249708	1507144	27660
4	Jhalkathi	4	1654727	90262	586807	3550
5	Bagerhat	9	2993364	107258	413892	27946
Total		**32**	**12222393**	**1809851**	**3345033**	**238592**

Table 5: Estimated Loss of Cattle and Buffalo in 5 Districts Assessed by FAO Team

Cattle and Buffalo						
	Name of District	No. of Upazila	Cattle		Buffalo	
			Population	Death	Population	Death
1	Pirojpur	7	232509	2568	6107	144
2	Borguna	5	256598	13154	19479	340
3	Patuakhali	7	562740	13662	172609	5615
4	Jhalkathi	4	124792	515	4449	26
5	Bagerhat	9	294501	3663	15761	235
Total		**32**	**1471140**	**33562**	**218405**	**6360**

Table 6: Estimated Loss of Goat and Sheep in 5 Districts Assessed by FAO Team

	Name of District	No. of Upazila	Goats		Sheep	
			Population	Death	Population	Death
1	Pirojpur	7	70441	4117	692	33
2	Borguna	5	154993	16651	1391	102
3	Patuakhali	7	156613	18069	11570	1570
4	Jhalkathi	4	28548	330	1000	32
5	Bagerhat	9	112921	6610	2805	38
Total		**32**	**523516**	**45777**	**17458**	**1775**

D.1. Institutional damages

A total of 20611 acres of grazing land was badly damaged through silt and salinity in Pirojpur, Borguna, Patuakhali and Bagerhat. Jhalkathi was the only district among the five sample districts where no grazing land was reported damaged. A total of 424 small-scale dairy farms were destroyed of which 313 are reported from Patuakhali alone. The farm size varies from 2 to 10 dairy cows. Nearly 2,962 poultry (chicken) farms have been completely destroyed in 5 districts. Most affected are small-scale household chicken and duck farms in Borguna and Patuakhali, owned mainly by landless households and managed by women. Moreover, 12,550 tons of poultry and cattle feeds were damaged. Livestock offices in four of the five districts visited were badly damaged by falling trees on the premises (Table 7).

Table 7: Damages on Livestock Institutions and Infrastructures in 5 Districts Assessed by FAO Team

	Name of District	No. of Upazila	Damage to Farms and Institutions				
			Grazing land (acre)	Fallen trees*	Dairy farm	Poultry farm	Feed (tonnes)
1	Pirojpur	7	1461	0	40	615	3222
2	Borguna	5	13860	48	24	927	5710
3	Patuakhali	7	4240	3	313	927	2548
4	Jhalkathi	4	0	330	9	158	15
5	Bagerhat	9	1050	136	38	335	1055
Total	**5**	**32**	**20611**	**517**	**424**	**2962**	**12550**

**No. of trees that fell and caused damage to livestock premises or structures.*

E. SUPPORT TO LIVESTOCK REHABILITATION

The FAO mission findings confirm by and large, the government estimates of casualties. At District level, losses have been estimated at: 18% for chicken; 7% for ducks; 11% for goats and 3% for cattle and buffalo. Many livestock have been injured and are weak and vulnerable to disease outbreak. Fodder is a major issue in most of the affected areas as grass and crop residues are non-edible in most areas. While poultry is mostly farmed by women and thus has a gender angle, cattle and buffalo play an important role as draft power.

Subsequently, provision of emergency feed for cattle and goats is considered as an immediate, time-critical intervention and a life saving measure for remaining animals as soon as possible. Similarly, provision of emergency medical and vaccination supplies, through the emergency veterinarian teams, is critical to ensure remaining livestock and poultry are protected against possible disease outbreaks. In order to improve effectiveness of the vaccination systems currently in operation, support will be provided to the cold chain development in the affected districts. In Addition, restocking some poultry and livestock for the most vulnerable households, especially female-headed households, is considered as immediate rehabilitation intervention. Additional restocking and measures to improve livestock and poultry farming systems are also necessary as part of the immediate rehabilitation efforts. Finally, assistance to improved livestock and poultry shelter, along with community-based fodder development demonstration sites are also considered as part of FAO's "Build Back Better" policy.

E.1. Roles of different stakeholders

FAO will be the implementing agency and as such responsible for the overall implementation of the entire recovery and rehabilitation process, in close cooperation and coordination with the relevant departments of the Government of Bangladesh. FAO Emergency Programme Coordinator and Emergency Field Coordinator will undertake procurement responsibilities at national level and where possible at district and Upazila level. Technical support, such as quarantine, vaccination, and selection of types of animals, will be sought from the DLS. Local/National NGOs will be contracted for the selection of beneficiaries, in line with agreed criteria, and for the actual delivery of goods and services, in close coordination with FAO field staff and the DLS at district and Upazila levels. Where available, farmers' associations and community groups will be mobilised to

ensure a fair selection criteria for the most vulnerable groups. Similar to Integrated Crop/Pest Management Clubs (IMPs and ICPs), the development of Farmers' Field Schools (FFS) would be promoted to ensure sustainability of the sector in support of long-term government strategy.

Overall monitoring and evaluation of the programme will be the responsibility of FAO staff, while partner NGOs will be responsible for day-to-day monitoring of activities.

E.2. Selection of Beneficiaries

Table 8: Total number of livestock and households in 32 severely-affected Upazilas

		Population in 000s					
Name of district	No. Upazillas	Cattle and buffaloes	No. of HH	Goats and sheep	No. of HH	Chicken and ducks	No. of HH
Pirojpur	7	239	84	71	34	3085	274
Borguna	5	276	81	156	35	2137	204
Patuakhali	7	735	129	168	56	4696	344
Jhalkathi	4	129	52	30	21	2242	156
Bagerhat	9	310	94	141	50	3407	289
Total	**32**	1689	440	566	196	15567	1267

Source: Department of Livestock Services (DLS) and Mission findings.

According to the data available from DLS in December 2007 there are 440,000 Households (HH) rearing cattle and buffaloes, 196,000, have goats and sheep, and 1.3 million households rear chickens and ducks in 32 selected Upazilas. Beneficiary selection and the type of intervention reflect the level of household vulnerability to food insecurity.

F. DESCRIPTION OF INDIVIDUAL PROGRAMME ACTIVITIES

Following the field assessment, the FAO team concluded that the damage to the agriculture sector, in general, and to the livestock sub-sector, in particular, has been severe. The rehabilitation of livestock sub-sector, therefore, will require immediate emergency and mid-term interventions to ensure affected communities can revitalise their livelihoods and to enable them to maintain and sustain the objectives achieved by the rehabilitation programme. The proposed programme intends to address the urgent needs of households depending on livestock for their livelihoods, while promoting long term sustainable development of the sector in line with government strategy.

F.1. Objective of the livestock programme

The overall objective of the livestock component is to facilitate early recovery of the livestock-based livelihoods of the most food insecure and vulnerable households in the worst-affected areas and thus ensure food security for the most vulnerable.

The immediate objectives are:

- Emergency supply of 3,906 MT of livestock feeds to 18,772 beneficiaries
- Emergency supply of life saving veterinary drugs and FMD vaccines in 32 severely affected Upazilas;
- Restocking of 1.2 million local chickens and ducks, 9,800 heads of goats and sheep, and 1,000 buffaloes in 32 Upazilas;
- Strengthening the cold chain system to improve the vaccination, especially chicken, in 32 Upazilas;

- Assist cyclone-affected households in reconstruction/making 5,000 smallholder poultry cages and 500 smallholder dairy sheds, mostly through training;
- Assist DLS in making 32 fodder demonstration unit to facilitate smallholder cattle and goat farming; and
- Assist build community livestock cyclone shelter in 10 villages on pilot basis.

G. ACTIVITY 1: EMERGENCY FEED AND MEDICINE SUPPLY (US$3.3 MILLION)

G.1. Emergency Livestock Feed Supply

A total of 3,906 Metric Tons (MT) costing 97.6 million (US$ 1.4 million) of livestock feeds will be distributed to 18,772 HH beneficiaries. Mostly the feeds will be given to smallholder farmers. 2,205 (56%) MT will be given to goat and sheep farmers (Table 9).

Table 9: Emergency Feeds Requirements for Time Critical Intervention in 32 Upazilas of 5 Districts

Type of Animals & no. of Beneficiaries			Feed required			Price in "000' Taka	
Type of Animals	No. of Beneficiary	No. of Animals	No.of Days	Daily Requirement (tonne)	Total Requirement (tonne)	Per Tonne	Total
Cattle	1248	1248	90	2.496	224.64	25	5616
Buffalo	763	763	90	1.526	137.34	25	3433.5
Goat	6127	12254	90	24.508	2205.72	25	55143
Sheep	1412	2824	90	5.648	508.32	25	12708
Chicken	6150	30750	180	3.075	553.5	25	13837.5
Duck	3072	15360	180	1.536	276.48	25	6912
Total	**18772**	**63199**		**38.789**	**3906**		**97650**

Assumptions:

1. Two kg of feed/day for one animal only will be distributed per household for cattle and buffalo.
2. Goat and sheep owners will receive 2 kg feeds/day for 2 animals.
3. Chicken and duck owners are the poorest segment of the society and were affected mostly. They would be given support for 180 days. Each bird needs approximately 100 gram/day. Each beneficiary will be getting feed for 5 birds per day.

Crop residue, the main source of feeding, has been washed away, inundated or affected by fungus following the cyclone. Alternative sources of fodder/feeding are limited and most livestock are already very weak for lack of feed. Failing to supply supplementary feeding is likely to increase casualties in the remaining livestock.

Feed will be provided to most vulnerable families in most affected districts for a period of 90 days for ruminants and 180 days for chicken and duck as life saving measure. The programme will benefit from DLS facilities and standards to ensure attaining quality feed.

Feeds in pellet and or loose form having around 12% crude protein will be procured as per FAO rules from different private feed mills (More than 200 in Bangladesh) and from local markets. The suppliers will be asked to deliver feeds in sacks of 50 Kg in different points of 32 Upazilas.

G.2. Emergency Livestock Medicine Supply

A combination of polluted environment and malnourishment has rendered livestock highly vulnerable to various diseases. The DLS has initiated limited veterinary support through emergency mobile veterinary teams, providing assistance to injured and sick stock. However, the DLS resources are meagre and cannot cover the urgent needs, given the scale of the devastation. The proposed intervention intends to strengthen this initiative further as life saving measure to the emergency veterinarian teams with the aim to prevent further losses in livestock.

Some 168,954 cattle and buffaloes, and 54,100 goats and sheep will be treated covering 10% of the population in 32 Upazilas. The vaccination against FMD will be done as per needs and only geographic targeting will be applied.

Table 10: Crucial livestock medicine to be supplied to beneficiaries

Sl. No	Type of medication	Requirements as per type of animal (10% of population)		Total animals to be treated/vaccinated
		Cattle and buffalo	Goat and sheep	
1	Antibiotic injection (10ml vial)	506,862 vials	27,050 vials	533912 vials
2	Antibiotic injection (2.5ml vial)	844770 vials	54100 vials	898870 vials
3	Anthelmentics (5X4 tablets/pkt)	84477 Pkt	4508	88985 pkts
4	Vitamins injection (30ml/vial)	8477 vials	9016 vials	93493 vials
5	FMD vaccines	400,000 doses	-	400,000

The provision of emergency medical supplies and vaccines ensures the survival of livestock in general; it supports the vulnerable households in maintaining their remaining livestock and poultry. Or, in other words the vulnerable people that still have some livestock may lose those and become poorer in absence of the support of getting livestock medication.

In most cases, economically well-off members of the community are involved in large- and medium-scale livestock farming. However, there are a significant number of landless and poor households who farm small-scale livestock farming; mostly through loans from government and/or NGOs. Many had started small and medium size chicken and duck farms as income-generating activities supported by the NGOs, while some had accumulated sufficient resources to acquire livestock.

The procurement will be done as per FAO rules and the suppliers will be asked to deliver goods at respective Upazila Livestock Offices. The utilization of the medicines will be monitored by FAO and its partner NGOs.

H. ACTIVITY 2: RESTOCKING POULTRY, GOATS/SHEEP AND BUFFALO (US$5.8 MILLION)

Many households have lost their main source of livelihoods and nutrition by loosing their livestock. Alternative sources of livelihoods are limited and in the absence of any significant restocking many households will be food insecure and vulnerable. Table 11 shows the target districts and the number of livestock to be supplied to target beneficiaries. The price of cattle is relatively high and returns per head and resilience is low relative to buffalo. Therefore, cattle has not been considered under the proposed programme, which only covers 5 percent and 10 percent of households rearing goats/sheep and poultry, respectively.

Table 11: Proposed number of activity and gender-wise beneficiaries (one from each household) for Time-Critical Intervention

Sl.No	Name of district	No. Upazila	Beneficiaries according to Activities and Gender (For cattle and buffalo: all male beneficiaries) (For goat, sheep, chicken and duck, all female beneficiaries)			
			Number of Beneficiaries			
			Cattle (male)	Buffalo (male)	Goat and sheep (all female)	Chicken and duck (all female)
1	Pirojpur	7	0	50	1700	27,400
2	Borguna	5	0	109	1750	20,400
3	Patuakhali	7	0	113	2800	34,400
4	Jhalkathi	4	0	224	1050	15,600
5	Bagerhat	9	0	504	2500	28,900
Total	**5**	**32**	**0**	**1000**	**9800**	**126,700**

H.1. Chickens and ducks

Poultry farming (chicken and duck) has been developed very rapidly over the past decade and now form a major source of livelihood among the most vulnerable groups, especially women. The cyclone damage to poultry has been devastating, with a total loss of birds in most cases, especially in villages along the riverbanks and sea embankments. Therefore, provision of emergency poultry to these households is critical to enable the communities to revitalise their livelihoods.

In view of widespread AI in the country, FAO as a matter of policy does not recommend restocking of poultry. However, most households will resume poultry farming at some point, as this is their only livelihood activity and an uncontrolled and haphazard restocking might be more damaging in long-term. Therefore, a controlled provision of poultry supply through FAO, in close cooperation and coordination with relevant government departments, such as the DLS, might as well prevent an AI outbreak that could be caused by uncontrolled supplies, often through loans from NGOs. A total of about 1.3 million chicken and ducks will be distributed to 126,700 beneficiaries (90% chicken and 10% ducks), in close collaboration and consultation with the FAO-implemented AI project.

The proposed restocking will draw on a Smallholder Livestock Development Programme funded by Danida, which trained many women beneficiaries in 5 southern districts during 2000 to 2005 on improved brooding of local chicken by using local broody hens and improved management. Selected and trained local brooders will be contracted for brooding and supplying chickens and ducks to 126,700 beneficiaries in 5 districts.

The following measures will be taken to ensure sufficient supply and reduce the risk of AI:

- Select 5,000 beneficiaries/suppliers for brooding, rearing chicks up to 3 months;
- Refresher course/new training for the beneficiaries on brooding and rearing chicken for 3 months before deliver it to programme (FAO);
- Active surveillance against AI to be taken by DLS staff members and FAO-AI project;
- Measures against AI to be taken to the areas where restocking will take place;
- Provide training to the recipients on AI, improved management including housing, general healthcare of poultry, feeds, and feeding;
- Distribution of 9 chickens and one male to each beneficiary;
- Provide feeds for 10 chickens for 90 days.

Cost involvement per chicken delivered to beneficiaries:

- Price paid to the brooder for 3 months old chicken: Tk 150
- Paid to recipient beneficiary 2 Kg supplementary feed: Tk 50
- Training, vaccination and other cost: Tk 20

Total cost **Tk 220**

Training cost:
5,000 brooders that will supply 3-months old chicken to 126,700 beneficiaries will be trained to have guaranteed supply of chicken on time.

The training course will involve following:

- Selection of big and healthy broody hen
- Criteria of selection of fertile eggs for hatching
- Maintenance of temperature during hatching
- Brooding Day Old Chicks
- Improved feeds and feeding
- Improved shelters for different kinds of chicken/duck

Total training cost **5,000X550= T. 2.75 million**

Restocking Sonali and Fayomi: Sonali bird, a cross between RIR and Fayomi, has been proven to be well adapted with improved management in village condition. These birds are available in the Government farms only. Avian Influenza is reported to prevail in all these farms at the moment. Even while writing this report news on fresh outbreak at Dhaka central poultry farm has come into media. Once the Government declares these farms free of AI the programme (FAO) may think of restocking Sonali in the cyclone affected areas. Budget for it is not kept at the moment. New funds will be required for it.

H.2. Goats and sheep

A total of 9,800 goats and sheep (5 to 6 months old weighing 7-8 Kg body weight) will be distributed to 9,800 beneficiaries, including 9,000 goats and 800 sheep will be distributed, see Table 11.

Black Bengal Goat gives multiple births, twins or triplets are born in 12 to 14 months. An adult male Black Bengal Goat can be of 18 Kg and a female can be of 15 Kg. Dressing percentage averages around 50%. It is a unique small ruminant in this part of the world. Its meat is very tender and tasty. Buyers pay premium price for the meat of this animal. The leather of Black Bengal Goat is soft and has very special demand in different developed countries in Europe and America.

Goats have many advantages and importance in the subsistence agricultural economy:

- Goats contribute to the subsistence of smallholders and landless rural poor. It has an important role in income generation, capital storage, employment generation and improving household nutrition.
- A goat produces per year around 130 Kg of dry manure which improves the soil fertility through its nutrients (more than cow and buffalo manure) and also by its residual effect on reducing soil pH.
- There is much less risk in goat rearing.
- There are much less housing requirement and management problem.
- Women and children essentially look after herding, feeding, and healthcare of goat.

The Department of Livestock Services considers goat rearing as one of the popular livelihoods among the rural poor. It has been providing services to the people within its

meager resources. The DLS has established goat farms in Rajshahi Dhaka, Sylhet, Chuadanga, and Jhenaidoho districts with the aim to preserve the genetic characteristics and further development of Black Bengal Goat.

Procurement and distribution

- Goats will be procured through private businessmen following FAO rules and regulation.
- DLS will be asked to support with vaccination of goats against Goat Pox before distribution to the beneficiaries.
- Surveillance will take place in the places of distribution.
- Goats will be kept for quarantine in a convenient place (ULO, NGO) for a week before distribution.
- All the recipients beneficiaries will be provided with a 5-days improved management training course including housing, feeding, general healthcare, and marketing.

Sheep: In Bangladesh sheep is mainly kept for meat. Its wool is not of good quality and usually nobody fleece wool in Bangladesh. Its benefits are same as goats.

Cost assumptions:

• Price paid for a 5-6 months old goat/sheep (7-8Kg):	Tk 1,700
• Paid to recipient beneficiary 15 Kg supplementary feed:	Tk 375
• 7 days quarantine cost	Tk 150
Total cost	**Tk 2,225**

Training on improved goat rearing:
For a continued improved goat rearing the project will offer 5-days training to 9,800 recipient beneficiaries with a potential multiplier effect in the southern districts.

The training course will cover the following topics:
* Criteria of selection of goat for fattening
* Importance of proper castration
* Improved management on feeds and feeding, housing, vaccination
* Timely marketing and its importance

Total training cost **550X 9,800= T.5.4 million**

H.3. Restocking two-year old she-buffalo to the landless poor

Households living near the river and Charland (Newly formed islands/coastal areas) experienced the full force of the cyclone and lost literally everything. The programme intends to provide 1,000 buffalos to as many vulnerable households, who usually rely on buffalo as a main source of livelihood with some fishing. This will not only restore the livelihoods of some of the most vulnerable households but will also reduce the pressure on the coastal fisheries, which is over-fished.

Buffalos are also used as pack animals, draught power and the provision of high protein milk. They survive on poor quality roughage and thrive in the coastal areas. The income from selling milk, draught power, transportation and the sale of off springs are considerable.

Procurement and distribution

The Following procedures to be maintained for procurement and distribution:

- The most vulnerable and asset poor households in Charlands and marginal lands will be selected and trained in rearing buffaloes.
- Suppliers will be contracted to collect and deliver buffaloes in the selected villages.
- Close monitoring during the whole programme period will be done and a report will be submitted highlighting lesson learnt for further expansion, if feasible.

Training cost:
Five-days training course on improved management of buffalo reraring will include:
* Selection criteria of buffalo for draught, milk, and dual purpose
* Improved feeds and feeding practice
* Proper marketing

1,000 beneficiaries will be trained on improved buffalo:

Total training cost **550X1,000=550,000 Taka**

I. ACTIVITY 3: SUPPORT TO COLD CHAIN SYSTEM (US$37 000)

The DLS produces substantial amounts of vaccines for both the poultry and livestock sub-sectors. The actual delivery of the vaccines in the field, especially in remote areas, is hampered by lack of sufficient and efficient cold chain system causing deaths of many livestock.

The proposed programme intends to provide some essential support to strengthen the system as a life saving measure for the remaining livestock and poultry and will continue to provide further support towards a more sustainable and cost-effective system in the rehabilitation phase, as part of its overall objective to "Build Better".

Table 12: Support to strengthen the veterinary cold chain in 32 cyclone affected Upazilas

	Name of district	No. of Upazila	Items required						
			8cft freezer	Cool box with ice cube tray		8cft freezer	Cold box	Cold box	Total
				20L	2L		20L	2L	
1	Pirojpur	7	7	14	175	210	56	175	441
2	Borguna	5	5	10	125	150	40	125	315
3	Patuakhali	7	7	14	175	210	56	175	441
4	Jhalkathi	4	4	8	100	120	32	100	252
5	Bagerhat	9	9	18	225	270	72	225	567
Total	**5**	**32**	**32**	**64**	**800**	**960**	**256**	**800**	**2016**

Notes: Costs include delivery of goods to the districts. Costs in "000" Taka.

* 8 cft freezer cost Taka 30,000 and one will be delivered to each Upazila.
* Two 20L insulated cool box will be delivered to each Upazila, each costing Taka 4000 including ice packs.
* Twenty five 2L insulated cool box will be delivered to each district for the poultry/livestock to carry vaccines to the villages packed with ice, Taka 1000 per unit, including ice cube trays. vaccinators, each costing TK 1,000.

The procured 32 freezers, along with 64 insulated bio of 20L, can be kept with the partner NGO in the Upazilas, subject to the agreement of DLS. The 800 insulated boxes will be distributed to 800 trained female poultry vaccinators in 32 Upazilas. The vaccinators will have one-day (couple of hours) training on vaccination, if they are not already trained. Electricity supply is rather unreliable and expected to be increasingly so given the rising fuel prices. The programme will also provide solar panels to ensure a reliable source of power to the 32 freezers.

Vaccination and monitoring will be carefully planned and must include the following minimum activities:

- The beneficiaries must be trained on the benefits of regular vaccination.
- The vaccinators must be trained and motivated on the issue.
- Announcement must be made in the community at least twice before having a vaccination campaign. A small notice can be posted in the local government representative offices. The mosque can play important role in announcing the date(s).
- The main stock of vaccines should be collected 7 days prior to vaccination date in an Upazila.
- Sufficient ice should be made during the vaccination campaign.

J. ACTIVITY 4: SUPPORT TO LIVESTOCK SHELTERS (US$540 000)

The mission found that most of the livestock were injured or died from falling trees and inadequate design of sheds. The programme envisages a modified design of sheds for large animals along with some essential purchased construction material.

Assistance will be given to repair 500 smallholder dairy sheds. Training will be an integral part of improved house making conducive to the floods cyclone prone areas. The assistance includes cash grants to purchase basic material and some training on improved livestock management including cost-effective housing. See Table 13 below.

Table 13: Support to restoration and reconstruction of small-scale farmhouses

	Name of district	No. of Upazilas	No. of farms damaged		Estimated costs (in "000" Taka)		
			Dairy	Poultry	Dairy	Poultry	Total
1	Pirojpur	7	40	1022	200	1230	1430
2	Borguna	5	24	1334	120	1854	1974
3	Patuakhali	7	313	1335	1565	1854	3419
4	Jhalkathi	4	60	565	45	316	361
5	Bagerhat	9	63	744	190	670	860
Total	**5**	**32**	**500**	**5000**	**2500**	**2500**	**5000**

* Taka 5000 is recommended per dairy farm

* Taka 2000 is recommended per poultry farm

J.1. Portable poultry shelter

Most of the poultry died due to inundation as chicken sheds got flooded while there were no escape routes for the birds. In addition, households could not take their poultry with them for lack of portable cages. Assistance will be provided to make 5,000 portable poultry sheds made of light materials (bamboo, thatch etc.). If needed, this shed can be carried by 2 persons (male or female) easily to a safer place during cyclone and flood.

This activity will be introduced through short-term training programme and the most vulnerable households will be provided with some cash grant to build such shelters. The beneficiaries will be selected by the partner NGOs under FAO supervision. A training manual will be prepared and the resource people for training will be mostly from DLS. Training programmes would also address issues of appropriate technologies for rural smallholder livestock and poultry production systems.

J.2. Fodder development demonstration sites

The rationale of making fodder development demonstration is to support the smallholder livestock rearers for further improvement of the stock. It will also facilitate government's Artificial Insemination Programme as without feed development the artificial insemination programme would be ineffective.

Fodder demonstrations sites will be established in 32 Upazila Livestock Offices in the most affected districts to support especially small-scale livestock farmers in the production of more efficient fodder. The sites will function as training centres and will also provide fodder seedlings to beneficiaries at the end of the training programme, along with support for basic materials and supplies.

Training will be the key factor to this intervention. Resource persons are mainly available with DLS.

The cost of making one fodder demonstration unit:	
Cost of land preparation, fertilizer, seedling	2,000 Taka
Cost for fencing	2,000 Taka
Training and maintenance cost	3,000 Taka
Total cost	**7,000 Taka**

J.3. Animal flood shelters

The mission understood that many rural dwellers did not move to the government-built and community-maintained cyclone shelters, because of fear of their livestock loss. Therefore, to encourage villagers to move to cyclone shelters in future, it is vital to establish flood/cyclone shelters closer to the human cyclone shelters.

The programme can make 10 such shelters in most vulnerable villages. The livestock flood shelters will be a raised place with a simple shed where villagers can bring their livestock during flood and cyclone. This may not save all the livestock but minimize the causalities. In addition, these livestock shelters will also serve as demonstration sites for replication elsewhere in the areas at risk.

The following principles will be followed:

- Food for work or cash for work, in collaboration with WFP will be used to build livestock cyclone shelters.
- Organize and motivate the community for making livestock shelters on participatory manner. The community must contribute partial cost by providing their labours.
- All the stakeholders including local leaders, local government, students will be included in the work.
- Coconut and palm trees will be planted around the shelter to have income for its maintenance and also protect the shed from the wind.

The estimated cost of making one livestock flood shelter is T.2.5 million.

Total cost **2,500,000 X 10 = 25,000,000**

ANNEX 4

COMPONENT IV: SUPPORT TO FORESTRY REHABILITATION (US$9.4 MILLION)

A. BACKGROUND

The Coastal belt of Bangladesh, once very rich on vegetation with mangrove forest and other trees, was destroyed due to increase in population, improvement of communication and construction of embankments. Bangladesh faced several devastating cyclone and tidal surges in 1970, 1985 and in 1991. The experience shows that planting trees and creating coastal protective live belt could minimize the devastation caused by repeated cyclones. Having realised the importance of green belts along the coast, the government undertook two major projects, the Coastal Afforestation Project and Coastal Green Belt Project, replanting massive mangrove along the coast and especially in the Sunderbans.

As a result of extensive reforestation efforts by the government, the impact of the SIDR cyclone in November 2007, so far the strongest to hit Bangladesh in decades, had been minimised and consequently the damage has been far less than expected.

The Sunderbans plays an important role in the country's bio-diversity, and attracts significant number of eco-tourists annually. It also protects the fisheries habitat, whereby fishing is the main livelihood activity for a large proportion of the communities in the area. Since fishing for most people, especially fishermen hired by boat owners, provides only subsistence income, the Sunderbans provides them with additional livelihood source in wood harvesting and other forest products. The Sunderbans is also home to wildlife, notably one of the largest tiger populations.

Agro-forestry plays an important role in the agriculture sector, not only in the protection of homes, gardens and the agriculture land and as a means of bio-diversity, but also as a source of income for many poor and marginalized households. Tree plantation around homesteads and agriculture land is an important element of creating solid asset for the households that can be harvested especially in times when cash is urgently required.

The Social Forestry Centres managed and run by the Department of Forestry plays a significant role in the afforestation schemes along roads, embankments, bridges and railways. And because it is community-based and managed, it is also an important source of livelihood and income for the communities involved. Assisted by the social forestry extension officers, community members are involved in the plantation, maintenance and harvesting of trees extensively. In addition to earning income form the sale of trees when harvested, group members involved in the social forestry are also encourages to grow vegetable, especially beans and pulses along the tracks, providing them with additional income.

B. FORESTRY RESOURCES

Only 16.63% of land area in Bangladesh (2.4 million hectares) is covered with forests, of which 9.87% (1.46 million hectares) is under the management of Forest Department (FD). 4.94% (0.73% million hectares) of unclassified state Forest (USF) Land in Chittagong region is almost entirely discarded. Village, homestead forestry covers another 1.83% (0.27 million Hectares) of land area in the country. The entire forest coverage of the country can be classified in:

Hill Forest in the hilly areas of South East and North East is made up of a mixture of many tropical evergreen and tropical deciduous Species in association with bamboo, with some 600 different tree species.

Plain land sal forest mainly in the elevated tracts of central and northern part of the country, is almost at the verge of extinction because of its proximity with habitation and over-exploitation.

Mangrove forest with its characteristic of Flora and Fauna developed in the tidal zone of the coastline of Bangladesh. The mangrove forests of Bangladesh are of two categories, the Sundarhans, the natural Mangrove forests and the Coastal tidal forests, the Mangrove Plantations. Covering an area of 139,000 ha, the Sunderbans was declared a world heritage site by UNESCO in 1997.

Village forests are a major source of timber and fuel and represent some 10% of the total forest coverage in the country supplying 70% of timber and some 80% of rural fuel, along with bamboo production used in local construction.

The Bangladesh Forestry Sector Master Plan of 1993 categorises the land distribution as follows:

Table 1: Land Distribution

Category	**Million hectares**
Agriculture	9.25
State forest: Classified	1.49
Unclassified	0.73
Private Forest	
Village	0.27
Tea/ Rubber	0.07
Urban	11.16
Water	0.94
Other	0.49
Total	**24.40**

Table 2: Land use category (FRA 2005)

Category	**Thousand hectares**
Forest	871
Other Wooded land	58
Other land	12 088
Inland water bodies	1 383
Other land with tree cover	343
Total	**14 743**

Table 3: Forest Distribution (FRA 2005)

Category		**Thousand hectares**
Natural forests:	hills	175.92
	plain	21.99
	littoral	395.33
Subtotal		**593.24**
Plantations:	hills	145.91
	plain	17.05
	littoral	79.72
	rubber	35.43
Total		**871.35**
Scattered Trees (Other wooded land)-		58.15
Homestead Forest & Strip plantations		342.67

Table 4: Growing Stock (FRA 2005)

Category		**Cubic Metre**
Plantations:	hills	1 516 027
	plains	1 968
	littoral	12 004

C. INSTITUTIONS

Bangladesh Forest Department (FD), under the Ministry of Environment and Forest, is responsible for the management of forest resources of the country. The forest department is mainly responsible for the conservation, management and development of forests and wildlife in the country. Forest department has staff in all forest division Ranges, beats and stations. For the Social Forestry development, the forests department has staff and nursery centres at Upazila level within the national administrative units. Within the forest department there is a monitoring cell and a RIMS/GIS unit at Headquarter in Dhaka, including separate wildlife circles and divisions within the forest department.

Bangladesh Forest Research Institute (BFRI): The BFRI, under the Ministry of Environment and Forestry, has the mandate to conduct forestry research throughout the country.

Universities and training centres: Three national universities offer forestry education for the forestry professionals, in addition to three main training centres maintained and managed by the Department of Forestry.

NGOs: Similarly, there are a number of national NGOs involved in the plantation of trees through communities and offer training and support in the development of forestry, especially homestead trees and nurseries.

D. CYCLONE DAMAGE ASSESSMENT

It is very difficult to assess the damage of trees in the homesteads, roadside and embankment plantation, mainly because of the scattered, size and number of homestead affected. But from our observation and discussion with forest department and interview with the local people in the affected areas it was estimated that at least 50% trees in the homestead have been lost. Many were uprooted with broken trunks and branches. Most trees were defoliated with a burnt-like look. Most of the damage was caused to *albizzia richardiana* (Chambol) and *summamia summon* (Rain tree), 2 alien species introduced recently in the South as a cash crop, and *swintonia macrophyla* (Mahogany).

The rain tree and chambol, both of alien species in the region, are mainly planted as fast growing trees for timber, fuel wood and other construction purposes. These trees are less resistant to strong winds and were the first to be uprooted or broken from the stem falling on houses, electric lines and other infrastructure facilities. The damages caused by falling trees are significant, many people lost their lives, livestock, houses, fishponds, horticulture gardens and other infrastructure.

The mission managed to visit most of the affected areas in two days of extensive travel with a speed boat through the various canals snaking in and out of the forests. The mission estimates that some 4-5 percent (20 -25,000 ha) of forest area has been severely damaged and nearly 15 percent (60,000 ha) partially damaged. Some alien species, which had been planted in various parts of the Sundarbans on a pilot basis, have been uprooted while in the severely affected areas a large number of trees have been broken from the stem or uprooted. In the partially damaged areas many branches have been broken but the main trunks of the trees are intact. These findings are similar to those of the Rangers and the Department of Forestry GOB.

The Government of Bangladesh has decided to keep monitoring the situation in the Sunderbans to assess the total damage and to monitor the consequences of the cyclone, both on the vegetation and its wildlife habitat. Some regeneration in the Sunderbans have already been noticed and many forestry officers believe that most of the partially damaged forests are likely to regenerate.

The impact of the cyclone and tidal surges may have serious ecological consequences on the mangrove forests in the Sunderbans, as its natural state has been severely disturbed. Some ecological adverse factor might affect the regeneration of mangrove species. The timber stand will be of poor quality and plant secession may not occur due to sedimentation mortality increase. One way to overcome the situation would be supporting its natural regeneration by reseeding, without too much disturbances.

E. SUB-COMPONENT 1: SUNDERBANS MANGROVE FOREST REHABILITATION (US$3.2 MILLION)

E.1 Objectives

The overall objective of this component is to prevent loss of lives and damage to properties by cyclone and tidal surges, by protecting and improving the coastal environment through increased forest cover and by assisting to increase the stability of coastal embankments.

The specific objectives of this component are: support government's efforts in poverty reduction by generating supplementary income opportunities in the coastal areas through forest-based cottage industry and others; and to support government efforts in adaptive measures against climatic change and thus reduce vulnerabilities in coastal zones.

E.2 Proposed Activities

Activities in this component will include rehabilitation and reconstruction of office facilities, including cyclone shelter, in form of an integrated office cum shelter premises; establishment of a forestry-biodiversity monitoring system to monitor and assess mid-term and long-term impact and effects of the cyclone on the Sunderbans that would enable responsible authorities to undertake necessary actions; establish a viable and effective biodiversity Monitoring and Evaluation system and provide necessary capacity building for forestry staff in this regard; provision of basic supplies, such as fuel for the boats for monitoring purposes by the rangers and other relevant officials; and improved communication equipment would support the Forest Department to fulfil its responsibilities and tasks in and around the Sunderbans more effectively.

Spatial monitoring and assessment: Monitoring and assessing the cyclone damage to the Sunderbans is essential in order to determine and estimate its natural recovery and regeneration process over time. To get a clear picture of the situation, satellite images will be required over, at least, a one-year period to compare the situation. Four sets of images will be necessary to carry out such comparison, ideally one image from October/November 2007 before the SIDR struck; one immediately after the cyclone struck; one six month after the cyclone and a final one a year after the cyclone.
The Resources Information and Management System (RIMS) unit of the Forest Department is highly equipped with remote sensing technologies and has the expertise to carry out sensing, processing, mapping and printing of the images. However, it will not have the necessary financial resources to effectively produce the required images and, therefore, the programme will support the unit to undertake this activity. Spatial resolutions of 5m or 10m and swath of 60km by 60 km will be sufficient for the images.

Monitoring and assessing the Sunderbans vegetation and ecosystem: The Management Plan Division of the Sunderbans will be supported to closely watch the impact of uprooted trees, branches and leaves on the ground and to monitor any ecological change in the forest area to ensure its natural regeneration is not affected by heavy layers of debris on the ground and/or the impact of trees severely affected at the top due to strong winds during the cyclone.

Monitoring of wildlife and biodiversity in the Sunderbans: The programme will support the Wildlife Division of Khulna, to carry out regular monitoring and assessment of the wildlife, especially as the regions natural habitat and food chain have been disturbed severely. The division will take regular samples, process the data and produce regular reports on the wildlife and biodiversity over a period of one year to ensure long-term damages can be avoided by taking necessary actions when required.

Training on monitoring and evaluation of coastal environment: The programme will organise a series of training programmes on Monitoring and Evaluation of coastal environment and mangrove forests, involving some 300 participants from the forest department working in Sunderbans and NGO field officers working in and around the Sunderbans. The Khulna Forest Conservator's Office will assist in the development of material and training courses, supported by FAO technical consultants and specialists.

The Government of Bangladesh has decided to "leave the Sunderbans to the nature", in other words allow for natural regeneration by reseeding without disturbing the forests. The above-mentioned activities in this component do exactly that, yet the activities will enable relevant authorities to improve the quality of their work, especially in monitoring the impacts in more professional and regular manner.

Support to rehabilitation of infrastructure in Sunderbans: The programme will provide some support to assist the forest department rehabilitate its infrastructure in and around the Sunderbans to facilitate all the activities related to Sunderbans planned in this programme.

Justification: The Sunderbans is one of the world largest mangrove forests and has been declared a national heritage by UNESCO. It plays an important role in the country's biodiversity and ecosystem and has saved tens of thousands of lives when the cyclone SIDR struck on 15 November 2007.

While the Government of Bangladesh has decided to leave the Sunderbans to its natural regeneration, without too much disturbances, it has also mentioned that assessing and monitoring the impact of the cyclone is vital to the regeneration process. The activities planned under this component will support the Government of Bangladesh to effectively monitor and evaluate the situation in the Sunderbans more effectively, especially considering the limitations in both material and technical resources. These activities will be vital to enable the Forest department to intervene more efficiently in the natural regeneration and to facilitate the processes. Therefore, no action would cause further damages to both the vegetation and the wildlife and might have serious consequences on the Sunderbans, with long-term impact, not only for Bangladesh, but also for the whole region.

Table 1: Major Activities for the Sunderbans Rehabilitation

SL. No.	Item	Quantity
1.	Construction and Repair of staff functional & residential buildings	50 No.
2.	Excavation/re-excavation of pond sand filter and water tanks	40 No.
3.	Repair & Purchase of boats, water crafts	52 No.
4.	Establishment of solar systems	20 No.
5.	Vehicle	1 No.
6.	Enhancement of natural regeneration by seedling	5000 ha.
7.	Damage Assessment & monitoring of Sunderbans through satellite imageries	12 month
8.	Study on impact assessment of vegetation and ecosystem	12 month
9.	Assessment of biodiversity and wildlife	10 month
10.	Training of FD staff in Monitoring and Evaluation systems and approaches appropriate for the Sunderbans	

E.3 Implementation Arrangements

FAO will be responsible for the overall planning, implementation and monitoring and evaluation of the component, in close cooperation and coordination with relevant government departments, especially the Forest Department, under the Ministry of Agriculture (MoA). Different departments of the MoA will undertake responsibility for specific areas of activities as outlined bellow.

The Sunderbans is a reserved forest and a protected area, managed solely by forest department under the Ministry of Environment and Forest. Consequently, the respective forest division will carry out the implementation of the rehabilitation work. Three responsible units within the Forest Department will carry out the assessment study and monitoring and evaluation of the Sunderbans. The Resource and Information Management System (RIMS) Cell will map, collect, collate and analyse data through remote sensing in the field. The Sunderbans Wildlife Division in Khulna will monitor all activities related to wildlife. The Management Plan Division of Khulna will be responsible for the vegetation regeneration and ecological studies.
DFO Sunderbans East and Sunderbans West will be responsible to implement the infrastructure Development and to assist natural regeneration activities by reseeding.

The programme will hire one national and one international consultant to support in the establishment of effective Monitoring and Evaluation system for the Sunderbans and to train staff of Forest Department in appropriate approaches to monitoring and evaluation. The consultants will support the department to establish a system for the regular assessment of the forests in the Sunderbans.

F. SUB-COMPONENT 2: AGRO-FORESTRY REHABILITATION (US$6.2 MILLION)

F.1 Objectives

The overall objective of this sub-component is to protect the environment, reduce the impact of future natural disasters on loss of lives and properties and to provide communities with supplementary income through increased and improved community-based agro-forestry.

The specific objectives of the sub-component are to strengthen the existing social forestry system in Bangladesh to support poor and marginal rural/farming communities with agro-forestry income generation opportunities and therewith support the national efforts on poverty reduction. Most vulnerable groups in rural communities, especially women and female-headed households will be targeted through this sub-component, supporting Bangladesh Government efforts to achieve its MDGs in terms of poverty reduction and gender equity goals.

F.2 Proposed Activities

The Program will cover 13 most-affected coastal districts in the Southern region of Bangladesh. These are: Barisal, Jhalakati, Patuakhali, Borguna, Bhola, Bagerhat, Pirojpur, Laksmipur, Noakhali, Khulna, Sariatpur, Madaripur and Gopalganj. In order to achieve the objectives of the sub-component, the following activities will be implemented, which will help develop a sustainable livelihood for coastal zone population and enhance environment and biodiversity protection in the target areas:

Afforestation: will support large-scale tree plantation along embankments, roads and railway-sides; homestead and institution plantations; foreshore coastal non-mangrove and palm plantation, and mangrove plantation. The social forestry approach, already successfully implemented by the Forest Department, will be adapted for the implementation of this activity.

Table 2: Major Activities for the Agro-Forestry/Social Forestry

SL. No.	Items	Quantity
1.	Embankment Plantation	300 km
2.	Roads & Highways Plantation	1000 km
3.	Feeder Roads Plantation	2000 km
4.	Foreshore Afforestation	78 km
5.	Mangrove Plantation	1000 ha.
6.	Non-mangrove Plantation	300 ha.
7.	Civil Works (Cyclone shelter cum Office Building)	13 (no.) 7800 Square
8.	Repair & Reconstruction of Functional Buildings	70 No.
9.	Water Crafts	18 No.
10.	Jetty Pontoon	10 No.
11.	Assistance to Home-Based Nursery Development	4000 No.
12.	Training for Home-Based Nurseries	8000 No.
13.	Monitoring & Evaluation	20 month

F.3 Choice of Plant Species

The Choice of Species largely depends on the ecological condition of the planting site. The objectives of the afforestation also govern the choice of species. Tropical plant species are huge in number. There is not much variation in site, especially in the cyclone prone area, except some limiting factors like salinity and water logging. The sandy beach and mud breaks predominately determine the different set of plant species in the

respective site. However an exhaustive list is difficult to prepare out of tropical plant species, but the following lists may be used as reference for appropriate plants and tress in each of the selected areas.

(For a detailed choice of Plantation in each section, please refer to Appendix 1)

Justification: The Social Forestry of the Forest department had been designed from its inception to enhance the environment and protect roads, highways and railway lines from tidal surges and floods, while targeting some of the most vulnerable members of the communities in the given areas, especially poor landless and marginalized groups of people, for many of whom the social forestry activities is the only source of income.

Therefore, no action will deprive the most vulnerable groups of their livelihoods and means of survival and will endanger the existing transport lines in the delta regions, often affected by regular tidal surges and flood waves.

Home-based nurseries: Home-based nurseries will be established through support by the social forestry sub-component to apply participatory, community-based approaches that the Forest Department has successfully implemented over the past decades. Beneficiaries will be trained in the establishment, maintenance, development and marketing of the nurseries and products and will be provided with material and seed/seedling packages at the end of the training. The Forest Department staff will provide regular monitoring and technical assistance for the actual nursery development.

The sub-component is expected to establish a firm basis for the development of a wider scale coastal greenbelt which will be an extensive tree cover consisting of (i) plantations of palm and non-mangrove tree species on the raised foreshore land; (ii) mixed species planting on coastal and inland embankments, roadside and railway-side strips and on mature old strip plantation areas raised under different projects after felling; (iv) homestead plantations; and (v) tree planting around public institutions and cyclone shelters.

Training: A total of 8000 men and women will attend a tailor-made training programme at Upazila level, delivered by the programme staff, supported by the forest department staff. Of these, 4000 women will be provided with necessary inputs to establish homestead nurseries.

Nursery development: Some 4000 satellite nurseries will be established in 13 most-affected coastal districts, managed by female participants who will be trained a one-week tailor-made training programme and equipped with the basic inputs, especially seeds/seedlings, fertilizer and some cash for equipment and other supplies. Each household will raise some 2500 popular plant species, which they would market upon complete growth. In cases, where beneficiaries cannot fetch good prices, the Forest department will purchase those at a predefined minimum price (Taka 5/seedling) and will utilise them for the social forestry initiative, along embankments, roads and highways, provided the seedlings have been well maintained and are in accordance with regular standards.

Programme staff and forest department field staff, along with partner NGOs, will closely monitor the process of the nursery development and provide necessary technical support where required.

Embankment plantation: Some 2000 km of river and offshore embankments in the coastal zone have been preventing homes and cropland from the intrusion of tidal surges associated with cyclone and floods that usually carry saline waters along and cause severe damage to the standing crops. Current assessments estimate that about 380 km of these embankments have been affected by the cyclone. In next 2 years, the programme intends to raise about 300 km of embankment plantation to prevent further

erosion and damage to land, lives and livelihoods of the communities in the area, along with environmental damages.

Cyclone shelter cum office building: There are a number of offshore islands, mostly used by fishermen in the post-monsoon season for fishing and fish drying, as temporary facilities. The Forest department is the only institution that has infrastructure in these islands. These are often made simple and temporary wooden structures with corrugated iron roofing vulnerable to cyclones and strong winds. The programme will support building cyclone-shelter cum office facilities that can be used for the forest department staff, but would also provide shelter to temporary fishermen during cyclones and tidal surges.

Justification: Homestead nurseries in the South have become an important source of livelihoods for most people, especially for most vulnerable groups, such as women and female-headed households. The cyclone has washed away almost the entire homestead nurseries and these groups of people have been severely affected and, therefore, no action will have severe impact on their livelihoods and will increase poverty in the region. The embankment plantation plays an important role in protecting agriculture land, homestead gardens and forestry, as well as properties and lives of people during cyclones and tidal surges and no action will further deteriorate the vulnerability of the communities along the embankments.

F.4 Implementation Arrangements

FAO will the executing agency and thus responsible for the overall planning, implementation and monitoring and evaluation of the component, in close cooperation and coordination with the relevant government departments, especially the Forest Department under the Ministry of Agriculture (MoA).

Forest Department: FD will make plan, design, and survey of the planting sites and arrange for plantation with the help of local government institution - district councils and union councils. The FD will assist FAO's partner NGO in the selection of beneficiary groups, in line with agreed criteria. The FD will maintain permanent register containing the names, parentage, address and other particulars of the beneficiaries, a copy of which will be kept in the Divisional Forest Office (DFO). Agreements will be signed with each beneficiary and the FD will maintain records and accounts.

Land Owning Agency: The Forestry Department, represented by the Divisional Forest Officer at the district headquarter, will maintain close liaison with the following land owning departments/agencies and get the clearance for afforestation according to the statement of National Forest Policy 1994:

- Bangladesh Water Development Board: Concerned Executive Engineer in case of Embankments.
- R&H Department: The concerned Executive Engineer based at the district head quarter.
- Railways Department: represented by Divisional Engineer.
- Feeder Roads:
  a. Represented by Union Council Chairman.
  b. Local Government Road - Represented by Executive Engineer of Local Government Engineering Department.
  c. District Council Road - Represented by Secretary District Council.

Beneficiaries: Will receive introductory training and packages and will be responsible for the plantation and maintenance of the plants. The FD field/social forestry officers will monitor the progress regularly and provide necessary backstopping and technical support.

Some 8000 beneficiaries will be selected among the most vulnerable groups of the communities, who will attend a tailor-made training programme for homestead nurseries. Women and female-headed households and landless community members will be given priority to participate in the programme. An additional substantial number of beneficiaries in 13 districts will benefit from the social forestry activities.

NGOs: NGOs will be selected by FAO, supported by FD, from the list of NGOs nominated by ADAB following NGO selection criteria prepared by FAO and approved by GOB. Programme staff will closely monitor partner agency(ies) activities, in collaboration with FD staff.

The responsibilities & liabilities of the NGO will be to monitor the village level nursery development in collaboration with the FD. NGOs will organize the participants into groups, which will take all measures for protection of the plantations.

Appendix 1

Choice of Tree Species for Agro-Social Forestry

Table 1: Plants Species Recommended for Newly Accreted Coastal Land

No.	Vernacular Name	Scientific Name	Uses
1.	Keora	*Sonneratia apetala*	Cyclone resilient tree species and honey plant
2.	Bain	*Avecennia officinalis*	Hardboard, Pool
3.	Gewa	*Exoccaria agalocha*	Pulpwood and match industry
4.	Kankra	*Bruguiera Sesangata*	Timber, Honey plant
5.	Goran	*Ceriops decandra*	Honey plant, Fuel wood with high calorific value.
6.	Golpata	*Nypa fruiticans*	Thatches and sugar produces
7.	Saila	*Sonneratia caseolaris*	Honey plant
8.	Khalshi	*Aegiceras corniculatum*	Honey plant
9.	Panial	*Calophyllum inophyllum*	Boat building
10.	Dhundal	*Xylocarpus granatum*	Pencil industry

Table 2: Trees for Embankment Plantation

No.	Vernacular Name	Scientific Name	Uses
1.	Khejur (Date palm)	*Phoenix dactylifera*	Fruits and sugar
2.	Tal	*Borassus flabellifer*	Fruits and sugar
3.	Coconut	*Cocos nucifera*	Oil, Cake, medicine and leaves used for thatches.
4.	Supari (Beetle nut)	*Areca catechu*	Medicinal value
5.	Sil Koroi	*Albizia procera*	Very good timber and cyclone resilient
6.	Mehogini	*Swietenia mahagoni*	Very good timber and cyclone resilient
7.	Shisham	*Dalbergia*	Sisso
8.	Panial	*Calophyllum inophyllum*	Boat building, Very good timber and cyclone resilient
9.	Ipil ipil	*Leucaena leucocephala*	Very good timber and cyclone resilient
10.	Kat badam	*Terminalia catappa*	Nut for wildlife, Very good timber and cyclone resilient
11.	Rain tree	*Samania saman*	Very good timber and cyclone resilient
12.	Akashmoni	*Acacia auriculiformis*	Very good timber and cyclone resilient
13.	Khoia Babla	*Pithecellobium dulce*	Fodder, Very good timber and cyclone resilient

Table 3: Plants for Homestead

No.	Vernacular Name	Scientific Name	Uses
1.	Mango (Aam)	*Mangifera indica*	Delicious fruit and good timber
2.	Jack fruit (Kathal)	*Artocarpus heterophyllus*	Delicious fruit and good timber
3.	Jambura	*Citrus grandis*	Fruit with medicinal value
4.	Jam	*Syzygium cumini*	Timber, fruits having medicinal value
5.	Bel	*Aegle marmelos*	Fruits having medicinal value
6.	Sharifa	*Annona squamosa*	Delicious fruit
7.	Lichu	*Litchi chinensis*	Delicious fruit
8.	Kamranga	*Averrhoa carambola*	Fruits having medicinal value
9.	Kul	*Zizyphus mauritiana*	Delicious fruit
10.	Dalim	*Punica granatum*	Fruits having medicinal value
11.	Jalpai	*Elaeocarpus robustus*	Fruits having medicinal value
12.	Citrus	*Citrus spp.*	Fruits having medicinal value
13.	Amra	*Spondias pinnata*	Fruits having medicinal value
14.	Jamrul	*Syzygium samrangense*	Fruits having medicinal value
15.	Coconut	*Cocos nucifera*	Oil, Cake, medicine and leaves used for thatches.
16.	Khezur	*Phoenix dactylifera*	Fruit and sugar
17.	Supari (Beetle nut)	*Areca catechu*	Medicinal value
18.	Tal	*Borassus flabellifer*	Fruits and sugar, timber used in house making
19.	Banana	*Musa sapientum*	Delicious Fruit
20.	Papaya	*Carica papaya*	Delicious fruit
21.	Pine apple	*Annas comosus*	Delicious fruit
22.	Sajina	*Moringa olifera*	Vegetable having medicinal value

Table 4: Plants for Institution

No.	Vernacular Name	Scientific Name	Uses
1.	Mehogini	*Swietenia mahagoni*	Very good timber and cyclone resilient
2.	Sonalu	*Cassia fistula*	Good timber, ornamental plant
3.	Kat badam	*Terminalia catappa*	Nut for wildlife, Very good timber and cyclone resilient
4.	Champa phul	*Michelia champaca*	Very good timber and ornamental
5.	Bakul	*Mimusops elangi*	Good timber, ornamental plant
6.	Nageswar	*Mesua ferra*	Good timber, ornamental and medicinal plant
7.	Asoka	*Saraca indica*	Good timber, medicinal plant
8.	Kanchan	*Bauhinia perpurea*	Good timber, medicinal plant, cyclone resilient,
9.	Mahua	*Madhuca indica*	Good timber, medicinal plant
10.	Neem	*Azadirachta indica*	Good timber, medicinal plant
11.	Bot	*Ficus benghalensis*	Timber and fuel wood, cyclone resilient, Shade
12.	Pakur	*Ficus infectonia*	Timber and fuel wood, cyclone resilient, Shade
13.	Arzun	*Terminalia belerica*	
14	Palash	*Butea monosperma*	ornamental and medicinal plant, cyclone resilient
15.	Patabahar	*Codiaeum variegatum*	ornamental plant
16.	Rangon	*Ixora coccinea*	ornamental plant

Table 5: Trees for Roads and Railway

No.	Vernacular Name	Scientific Name	Uses
1.	Mehogini	*Swietenia mahagoni*	Very good timber and cyclone resilient
2.	Akashmoni	*Acacia auriculiformis*	Very good timber and cyclone resilient
3.	Shisham	*Dalbergia*	Sisso
4.	Babla	*Acacia nitoltica*	Fodder, timber and cyclone resilient
5.	Khair	*Acacia catechu*	Fodder, timber and cyclone resilient
6.	Arzun	*Terminalia belerica*	Good timber, medicinal plant, cyclone resilient
7.	Jarul	*Lagerstromia flosvermia*	Timber used for boat building, Ornamental plant, Cyclone resilient
8.	Hizal	*Barringtonia acutangula*	Cyclone resilient
9.	Pitali	*Trewia polycarpa*	Cyclone resilient
10.	Gab	*Diospyros peregrina*	Fruit with medicinal value, Cyclone resilient
11.	Bot	*Ficus benghalensis*	Timber and fuel wood, cyclone resilient, Shade

ANNEX 5

COMPONENT V: PROGRAMME IMPLEMENTATION SUPPORT (US$6.67 MILLION)

(Refer to Section F in the main emergency programme document)

A. INSTITUTIONAL ARRANGEMENTS

FAO is the implementing agency for the programme in partnership with the relevant government departments. Considering the urgency and the scope of the intervention and the geographic coverage area, especially during the emergency phase, it will be impossible for FAO and the government to deliver planned goods and services to the communities directly. Therefore, FAO will partner with national and/or local NGOs, who have access to almost every village for the actual delivery, under strict control and supervision of FAO programme staff and where available government authorities. Where needed and possible, the private sector will be utilised to deliver goods and services procured by FAO to the communities.

B. COORDINATION WITH GOVERNMENT

The Government of Bangladesh has established a National Cyclone-Sidr Coordination Committee (henceforth The National Committee) led by the Ministry of Food and Disaster Management (MFDM) in Dhaka. The National Committee has been tasked to coordinate all rehabilitation efforts among national and international agencies. The National Committee will be requested to assign a focal point for the agriculture sector, with whom the FAO Emergency Programme Coordinator, based in Dhaka, will closely liaise and coordinate.

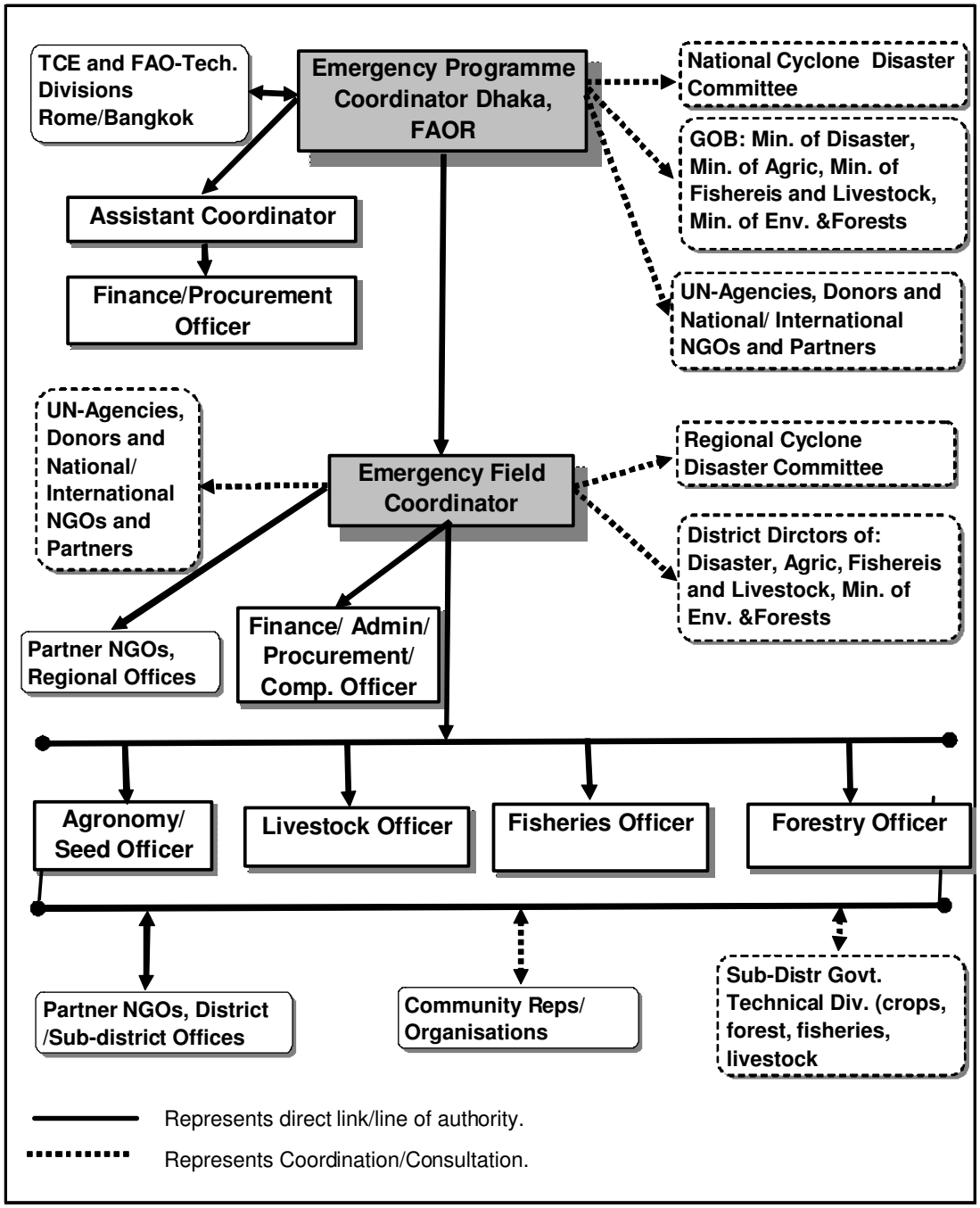
- The Emergency Programme Coordinator, in close coordination with the national focal point, will coordinate overall implementation strategy as agreed in programme document, monitor the process closely and suggest changes in the implementation strategy if needed.
- The Emergency Programmes Coordinator will liaise between government and FAOR and HQs.
- The Emergency Programme Coordinator will coordinate with other UN agencies (attends cluster meetings), NGOs, development partners and other actors and will liaise with donors.

A Division Coordination Committee (DCC) has been established in Barisal to coordinate and facilitate all relevant rehabilitation projects and programmes in the cyclone affected districts. The DCC is also led by the MFDM, which has sub-branches at district and sub-district levels. Staff from relevant technical ministries are members of the DCC at different levels. The Emergency Field Coordinator will be a member of the DCC and will also act as secretariat for the agricultural sector, organising meetings, taking notes and following action plans, in close coordination and cooperation with the Emergency Programme Coordinator in Dhaka. Representatives of partner NGOs at District level may be included in the DCC as observers.

- Regular meetings will review day-to-day implementation progress in accordance with agreed plans and will revise plans where necessary. During the next six months biweekly meetings might be necessary to ensure a smooth take off of the activities, while monthly meetings might suffice thereafter.
- The DCC will assign a senior officer to counterpart with the Field Coordinator and to assist with processes and procedures at Upazila and community levels.

Identification of beneficiaries and practical delivery of assistance will be carried out through NGO-established loan groups with the assistance of partner NGOs and active involvement of local sectoral authorities (agriculture Block Extension Officers and Social Forestry groups and officers), and where available and active with support of the Union Council members and Chairperson. Rehabilitation and development of homestead forestry will use the Social Forestry model of the Forest Department, whereby FAO's national technical experts will carry out training programmes and delivery of goods and services. Where needed, NGO support would be sought at local level.

Chart 1: FAO Emergency Programme Implementation Unit (EPIU)



C. TERMS OF REFERENCE FOR IMPLEMENTATION ARRANGEMENTS

The following generic Terms of References (TORs) are prepared for key staff of the Emergency Programme Implementation Unit (EPIU). These and other TORs for all required staff, as stipulated in the Chart 1 above, will have to be revised with detailed activities and deliverables as well as an extended line of reporting and responsibilities.

C.1. Emergency Programme Coordinator (based in Dhaka)

- Reports directly to the FAOR and TCE at the HQs;
- Oversees overall implementation;
- Coordinates and liaises with central government, UN, NGOs and Donors;
- Selects local, national and/or international partner NGOs in Dhaka for the actual programme implementation, in close coordination with FAOR and signs agreements in line with FAO standards and rules and regulations;
- Supervises the Emergency Field Coordinator, Support and Technical staff as presented in Chart 1 above.
- Reviews implementation strategy regularly with FAOR, TCER and Government; and revises strategy when necessary in close coordination with government, TCER and FAOR;
- Manages and oversees human and financial resources;
- Submits proposals for fundraising to FAOR and HQ, if and when needed;
- Establishes effective monitoring and evaluation systems and monitors progress regularly through regular field visits; essential monitoring indicators have already been established as integrated part of the programme that should be used as the basis for an overall monitoring and evaluation process;
- Submits regular reports to FAOR, HQ and government's coordination unit (monthly during the initial three months); in addition, periodic (three-monthly) reports will be submitted to FAOR and HQs to monitor progress, review possible changes and adapt the programme in view of its short- and mid-term objectives and achievements;
- Participates in coordination meetings, organised by the relevant government departments, UN agencies (cluster meetings and others) and other national and international agencies related to cyclone response; and
- Carries out any other duties related to the cyclone-rehabilitation response as requested by TCE and the FAOR.

Qualifications
The incumbent should possess a higher education degree, MSc or PhD in social sciences (economics, management and finance, development or rural sociology) or in one of the four sub-sectors (Agriculture, Forestry, Fishery or livestock). A minimum 10 years of relevant professional experiences is essential, work in emergencies with international organisations, particularly in South Asia or Bangladesh is favourable. Must be fluent in English, with excellent drafting capabilities. Must have good management skills, deliver under tight schedule and prepared to travel within the country as and when required.

C.2. Assistant Programme Coordinator (based in Dhaka)

- Reports directly to the Emergency Programme Coordinator;
- Assists the Programme Coordinator in the overall implementation of the programme;
- Manages Finance and Procurement Officer and provides direct support to the Emergency Field Coordinator in the actual implementation of the Programme;
- Carries out all other responsibilities of the Programme Coordinator in his/her absence and/or as assigned by the Programme Coordinator; and

- Carries out any other duties that might be assigned by the Programme Coordinator in direct relation to the emergency programme.

Qualifications
The incumbent should possess an education degree, BA or BSc in social sciences (economics, management and finance, development or rural sociology) or in one of the four sub-sectors (Agriculture, Forestry, Fishery or livestock). A minimum 6 years of relevant professional experiences is essential, work in emergencies with international organisations, particularly in Bangladesh or South Asia is favourable. Must be fluent in English, with excellent drafting capabilities. Must have good management skills, deliver under tight schedule and prepared to travel within the country as and when required.

C.3. Emergency Field Coordinator (based in Barisal)

- Reports directly to the Programme Coordinator in Dhaka and FAOR;
- Coordinates and oversees day-to-day implementation and ensures timely implementation in line with agreed plans;
- Ensures quality programme delivery in line with FAO standards and ensures implementation fully utilises synergies with other agencies and the Government of Bangladesh strategy for cyclone recovery and rehabilitation strategy;
- Coordinates and liaises with District authorities and acts as secretariat for the Division Coordination Committee on agriculture;
- Ensures effective delivery of assistance by the programme and coordinates with local authorities, Council Unions, NGOs and community groups on identification of most needy beneficiaries;
- Identifies gaps in the implementation process (from supply to delivery) and finds appropriate solutions in coordination and cooperation with Emergency Programme Coordinator, national technical coordinators and DCC;
- Manages and oversees budgets, national emergency officers, and technical assistance (national and international) and submits regular reports concerning financial and human resources issues to the Emergency Programme Coordinator;
- Organises regular (weekly) staff meetings to discuss progress and plan actions;
- Organises monitoring and evaluation missions by the HQs, FAOR, the Emergency Programme Coordinator and any other relevant person/institute that might be assigned by FAO;
- Prepares detailed M&E plan for all four components and ensure that all relevant information is collected according to plan, based on the draft that has already been prepared (See Annex 7.)
- Liaises and coordinates closely with district level NGO representatives (National and international) to ensure smooth and on time delivery of goods and services in line with agreed plans;
- Ensures timely implementation in line with agreed plans and submits regular monitoring and progress reports to programme coordinator; weekly reports will be necessary during the initial four months of the programme, especially when delivering time-critical emergency inputs, and
- Participates in coordination meetings, organised by relevant government departments, UN agencies (cluster meetings) and others at division and district levels.

Qualifications
The incumbent should possess a higher education degree, MSc or PhD in social sciences (economics, management and finance, development or rural sociology) or in one of the four sub-sectors (Agriculture, Forestry, Fishery or livestock). A minimum 10 years of relevant professional experiences is essential, work in emergencies with international organisations, particularly in South Asia or Bangladesh is favourable. Must be fluent in

English, with excellent drafting capabilities. Must have good management skills, deliver under tight schedule and prepared to travel within the country as and when required.

C.4. Field Staff, National and International Technical Assistance

National sectoral officers and any other staff in the field, including short-term national and international technical assistance, will be coordinated by the Emergency Field Coordinator in Barisal under the supervision of Emergency Programme Coordinator in Dhaka.

Field staff's primary responsibilities include:

- Reports directly to the Emergency Filed Coordinator and work under overall supervision and guidance of the Emergency Programme Coordinator in Dhaka;
- Revises the plan of implementation and M&E plan and ensures sufficient measures are in place to facilitate smooth implementation of both plans;
- Coordinates and liaises with government field offices, partner NGOs and Union Councils, where appropriate;
- Monitors partner NGO activities closely and ensures effective beneficiary selection and delivery of goods and services, through regular field visits;
- Coordinates and liaises with the private sector, in the delivery of goods and services, where appropriate;
- Introduces best practices and provides technical support to partner NGOs and Emergency Field Coordinator where required to ensure delivery of quality goods and services in line with FAO standards and agreed plans;
- Monitors sectoral activities and delivers regular reports to the Emergency Field Coordinator, including gaps in the implementation process and lessons learned for improvement in the implementation process and future plans;
- Where misunderstandings and/or disagreements arise, the team is encouraged to resolve those internally with direct intervention of the Emergency Field Coordinator; where such disagreements cannot be resolved internally, the Emergency Programme Coordinator in Dhaka will be requested to intervene;
- Participates in regular staff meetings organised and chaired by the Emergency Field Coordinator;
- Participates in technical coordination meetings, organised by government departments and international agencies, especially UN, where and when required; and
- Carries out any other duty as request by Field/Programme Coordinator.

C.5. Partner NGOs/Implementing Partners

Partner NGOs, hereafter called Implementing Partners (IPs) will be contracted by the Emergency Programme Coordinator in Dhaka with the Assistance from Field Coordinator at national/Divisional level and will be working closely under the supervision of Emergency Field Coordinator in Barisal and technical staff. The Emergency Programme Coordinator will closely monitor and supervise progress and liaise directly with IPs' Head Quarters on overall issues related to the implementation.

IPs primary roles and responsibilities include, among others*:*

- Effective selection of most affected beneficiaries, following selection criteria as agreed in the agreement signed at the national level;
- Timely delivery of goods and services at community level, in line with agreed plans and handling of the private sector involvement where required;
- Timely and effective distribution of goods and services, in line with agreed plans;

Annex 6 - Table 1: Detailed Costs for Component I - Support to Fisheries Rehabilitation.

				Quantities								Value, in 000s US$								
Taka:US$ Exchange Rate		68		Year 1 - trimester				Year 2 - trimester				Year 1 - trimester				Year 2 - trimester				
Items	**Units**	**Unit Price**		**1 -3**	**4- 6**	**7- 9**	**10 - 12**	**1 -3**	**4- 6**	**7- 9**	**10 -12**	**1 -3**	**4- 6**	**7- 9**	**10 - 12**	**1 -3**	**4- 6**	**7- 9**	**10 - 12**	**Total**
Sub-Component 1: Aquaculture																				
Emergency Input Supply to Aquaculture restocking																				
Bagda/1	Pack	60	4,000				2,000					240	-	-	-	120	-	-	-	360
Golda/1	"	125		5,000				3,300				-	624	-	-	-	412	-	-	1,035
Carp/1	"	48		20,000				16,000				-	956	-	-	-	765	-	-	1,721
Water Testing Kits	set	588	40									24								24
Training for Aquaculture farmers/2	Course	279	16	20	80		8	13	63			4	6	22	-	2	4	18		56
NGO contracts @ 10%	LS											27	159	2	-	12	118	2	-	320
Subtotal Aquaculture												**295**	**1,744**	**25**	**-**	**134**	**1,298**	**19**	**-**	**3,515**
Sub-Component 2: Capture Fisheries																				
Naval Architect Int consultant	Months	11,000	2				1					17	-	-	-	8	-	-	-	25
Gear Technlogist Int consultant	Months	11,000	2				1					17	-	-	-	8	-	-	-	25
Survey deisgn specialist Int cosultant	Months	11,000	1				1					11	-	-	-	8	-	-	-	19
Technical Backstopping from FAO./3	Week	4,635			6				6			-	-	28	-	-	-	28	-	56
Travel for Int. Cons. And FAO staff.	LS											9		6				6		21
NGO contract survey/4	Months	3,676		3	2							-	11	7	-	-	-	-	-	18
Study floating families/5	Months	2,206		3								-	7	-	-	-	-	-	-	7
Training of boat builders/6	Course	1,471	2									3	-	-	-	-	-	-	-	3
Distribution of assets/7												-	-	-	-	-	-	-	-	
Units of 25 - 30 ft vessels incl gear	Units	12,353			100	100	100	50	25	25		-	-	1,235	1,235	1,235	618	309	309	4,941
Units of 35 - 40 ft vessels incl gear	Units	20,588			20	40	30	20	20	20		-	-	412	824	618	412	412	412	3,088
Training in safety at sea/8	Course	279		-	44	48	46	24	14			-	-	12	13	13	7	4	-	49
Contract partner NGO(s) @ 10%												0	-	166	207	187	104	72	72	808
Subtotal Capture Fisheries												**56**	**18**	**1,866**	**2,279**	**2,077**	**1,140**	**831**	**793**	**9,060**
Operating Costs (HQ 10%)												35	176	189	228	221	244	85	79	1,257
Total Component Costs												**386**	**1,937**	**2,080**	**2,507**	**2,433**	**2,681**	**935**	**872**	**13,832**

Footnotes:

1 See separate tables for details of packages.

2 One-day course, 25/course, cost include resource 2 person, material, allowances (T.100/person, material 500/person, Res. person T.2000/res.person)

2 8 NGO teams for 18 months 8. Three staff members in each team, operational costs, supplies and equipment,and overhead. One unit is one team for one month

3 Includes, Honorarium @$717/working day, and DSA @ $150/day and travel US$ 3000. Two experts

4 Calculated as 5 teams with 2 persons in each team for five months, plus management and specialist inputs, operational costs

5 Calculated as one team of 3 specialists for three months, plus management and operational costs

6 Two courses 100,000 Tk each

7 Two categories of boats have been choosen with following specifications. Note that specifications will be modified after inputs from Naval Architect

Only gill nets have been proposed. Note that specifications will be modified after inputs from Gear Technologist

8 1-day course, 25 pepole/course, costs include 2 resource person/course, allowances (T.100/person, material 500/person, Res. Person T.2000/res. person)

Annex 6 - Table 2: Detailed Costs for Component II - Support to Agriculture Rehabilitation.

			Quantities								Value, in 000s US$								
		Unit	Year 1 - trimester				Year 2 - trimester				Year 1 - trimester				Year 2 - trimester				
Items	Units	Price	1 -3	4- 6	7- 9	10 -12	1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	Total
Horticulture seeds/seedling																			
Vegetable Seeds Package	Set	4.3	23000				23000				100				100				199
Fruit Seedlings/Saplings	units	0.6		300000								180							180
Banana Suckers	units	0.3		500000								150							150
Betle Leaf Vines	various	20.0		20000								400							400
Subtotal:											**100**	**730**	**-**	**-**	**100**	**-**	**-**	**-**	**929**
Cereal seeds and Fertilisers																			-
Aus Rice Seed (HYV)	MT	800	2,298								1,838	-							1,838
Amon Rice Seed/1	MT	800		2,698							-	2,158							2,158
Urea	MT	250	6,895	9,315							1,724	2,329							4,052
Triple Superphospahte	MT	500	2,298	2,698							1,149	1,349							2,498
Muriate of Potash	MT	500	2,298	2,698							1,149	1,349							2,498
Subtotal:											**5,860**	**7,185**	**-**	**-**	**-**	**-**	**-**	**-**	**13,045**
Pulses/Bean Seeds																			-
Kasheri (Grass beans/Lental)	MT	1,000		25								25							25
Mungbean	MT	1,000		25								25							25
Lentil	MT	1,000		25								25							25
Groundnut	MT	1,000		15								15							15
Subtotal:											**-**	**90**	**-**	**-**	**-**	**-**	**-**	**-**	**90**
Non-Expendable Equipments (150 ICM Clubs)																			-
Power Tillers (4/ICM Club)	Units	1500				600								900					900
Threshers (Pedal Types)	Units	100				600								60					60
Irrigation Pumps	Units	150				600								90					90
Sprayers	Units	100				600								60					60
Batch Dryers	Units	500				300								150					150
Maintainance and Rehabilitation of P/Tillers	Units	1000				100								100					100
Weighing Scale and Moisture Meters	Units	200				300								60					60
Cereal Seed Storage Drums/2	Units	12	53,700									644		-					644
Veg. Seed Storage Drums./2	Units	8	53,700									430		-					430
Reconstruction of ICM premises	LS	1000			150								150	-					150
Subtotal:											**-**	**1,074**	**150**	**1,420**	**-**	**-**	**-**	**-**	**2,644**
Training Costs																			-
Training DAE and NGO Staff/7	Person	50		100			150		150		5	-	-	8	-	8	-		20
Training for ICM members/8	Person	15		4500			4500				68	-	-	68	-	-			135
Subtotal:											**73**	**-**	**-**	**75**	**-**	**8**			**155**
Total Costs											**6,032**	**9,079**	**150**	**1,495**	**100**	**8**	**-**	**-**	**16,863**
Contracts with NGOs (Distributions)/6	LS										603	908	15	150	10	1	-	-	1,686
Direct Operating Costs (HQ: 10%)											603	908	15	150	10	1	-	-	1,686
Total Sub-Component Costs											**7,239**	**10,895**	**180**	**1,794**	**120**	**9**	**-**	**-**	**20,236**

Footnotes:

1. 75%Local Varieties and 25%HYV
2. Plastic Drums to keep seeds safe. only 10% of small and marginal farmers in 4 target districts.
3. Includes Travel (@ US$ 3000 per year)
4. Includes, Honorarium @$717/working day, and DSA @ $150/day
5. Includes Travel (@ US$ 3000 per year for International consultant and $3000/mission for technical backstopping.
6. Implemetnation costs @ 10% of the value of seeds and Fert. Distribut + ICM.
7. 5-day course, conducted by partner NGO - costs (T.100/trainee, resource persons + other costs)
8. 5-day course, conducted by partner NGO - costs (100/trainee, resource persons + other costs), 150 ICM X 30 = 4500.
9. Includes, Driver + fuel and maintenance.

Annex 6 - Table 2a: Detailed Costs for Component II - Support to Agriculture Rehabilitation.

Seed Sub-Component Budget

Items	Units	Unit Price	Quantities Year 1	Year 2	Year 3	Year 4	Year 5	Value in 000s US$ Year 1	Year 2	Year 3	Year 4	Year 5	Total
Expendable Equipment	LS							-	-	-	-	-	**0**
Foundation Seed and Fertilizer								25	75	100	90	-	**290**
Seed Storage Facilities for Prod. groups	LS							20	15	20			**55**
Seed treating chemical & Seed packaging (bags, labels, etc.)								9	19	28	19	-	**75**
Non Expedable Equipment	LS							145	165	30	-	-	**340**
Trainings/Workshops	LS							-	-	-	-	-	**0**
In service Training								10	10	6	4	-	**30**
Workshops	LS							3	-	2	-	-	**5**
Human Resources													
International Consultant	Months	15,000	4	4	3	3	1	60	60	45	45	15	**225**
National Consultant	Months	2,000	16	16	15	15	12	32	32	30	30	24	**148**
Admn/Finance Assistant	Months	400	12	12	12	12	12	5	5	5	5	5	**24**
Driver/Mechanic	Months	300	12	12	12	12	12	4	4	4	4	4	**18**
Travel													**0**
International Consultant	LS						0	16	12	12	12	-	**52**
Duty Travel for FAO HQ STS	LS							-	5	-	5	-	**10**
National Consultant	LS							6	5	5	5	1	**20**
Technical Support Service	LS							10	13	16	17	-	**56**
General Operating Expenses	LS							34	60	75	120	-	**288**
Support Cost (10%)								38	48	38	35	5	**164**
Subtotal								**416**	**525**	**415**	**390**	**53**	**1,799**
Physical and Price contingency 10%								42	53	41	39	5	180
Total Costs								**457**	**578**	**456**	**429**	**59**	**1,979**

Footnotes:

Training

In service training

Workshops

Expendable Equipment

Foundation Seed and fertilizers

Seed treating chemical & Seed packaging (bags, labels, etc.)

Non-Expendable Equipment

Office furniture and equipment

Seed farm and laboratory equipment

Portable Seed processing units (Three)

Transportation equipment

Communications equipment

Vehicle (one)

Technical Support Services

STS from HQ/Regional Office for Asia and the Pacific

Stand. Supervisory Tech. services of LTU (AGPS)

Report costs

General Operating Expenses

Vehicle operation and maintenance

Capital to initiate "Certified Seed RevolvingFund" (US$50/MT)

Miscellaneous sundries

Donor visibility (posters, stickers, media mtgs,etc.)

Reporting

Other GOE costs - Freight and insurance premium ,etc

Annex 6 - Table 3: Detailed Costs for Component III - Livestock Rehabilitation.

				Quantities						Value, in 000s US$						
Take:US$ Exchange Rate		68														
			Unit	Year 1 - trimester				Year 2 -		Year 1 - trimester				Year 2 -		
Items	**Units**		**Price**	**1 -3**	**4- 6**	**7- 9**	**10 - 12**	**1 -3**	**4-12**	**1 -3**	**4- 6**	**7- 9**	**10 - 12**	**1 -3**	**4- 12**	**Total**
Emergency Feed and Medicine Supply																
Emergency Feed Supply/1	MT		368	3,906						1,436						1,436
Emergency Medication Supply./2			-							-						
Antibiotic injection 10 ml.	Pcs		0.66	533,912						353						353
Antibiotic injection, 2.5 mg Vial	Pcs		0.18	898,870						159						159
Anthelmentics 5X4 Tab. Pkt/3	pkt		3.38	88,985						301						301
Vitamins(injection) 30ml Vial.	Sets.		1.99	93,493						186						186
FMD - Vaccines	Doses		0.44	100,000	100,000	100,000	100,000			44	44	44	44			176
Application Costs/4	LS		-							7	7	7	7			29
NGO Contract @10%										248	4	4	4			261
Subtotal										**2,734**	**56**	**56**	**56**			**2,902**
Bio-secure Restocking																
Training local brooders/5	Person		8	2,500	2,500					20	20					40
Restocking of local breed poultry/6	head		3	267,000	200,000	200,000	200,000	200,000	200,000	864	647	647	647	647	647	4,099
Restocking sheep and goat/7	head		33	1,800	2,000	2,000	1,000	2,000	1,000	59	65	65	33	65	33	321
Training in imprvd goat rearing/8	Person		8	1,800	2,000	2,000	1,000	2,000	1,000	15	16	16	8	16	8	79
Restocking 2-year she buffalo/7	head		294		200	200	200	200	200	-	59	59	59	59	59	294
Training in imprvd buffalo rearing/8	Person		8		200	200	200	200	200	-	2	2	2	2	2	8
NGO Contract @10%										96	81	79	75	79	75	484
Subtotal										**1,053**	**890**	**868**	**823**	**868**	**823**	**5,326**
Support to cold chain development in 32 sub-districts																
Freezers 8 cft.	Set		441	10	22					4	10					14
Insulated cool Box 20 L.	Set		59	20	44					1	3					4
Insulated cool Box 2 L.	Set		15	250	550					4	8					12
Solar Panels for Freezers	Set		2,206	10	22					22	49					71
NGO Contract @10%										1	2					3
Subtotal										**32**	**71**					**103**
Assistance to improved livestock shelter/7			-													
Portable poultry shelter	Set		7	2,000	1,000	1,000	1,000			15	7	7	7			37
Improved Shelter for large animals	Set		74	200	300					15	22	-	-			37
Fodder Dev. Demonstration Sites.	Site		103			10	12	10	10	-	-	1	1	1	1	4
Animal Flood/cyclone Shelter	Site		36,765			10						368				368
NGO Contract @10%										3	3	38	1	0	0	45
Subtotal										**32**	**32**	**414**	**9**	**1**	**1**	**490**
Tech. Assistance & other costs																
Technical Backstopping/7	Week		4,635	3			3			14	-	-	14	-	-	28
Travel/8	LS									3	-		3			6
Other Costs/9	LS									5	2	2	2	1	1	13
Subtotal										**22**	**2**	**2**	**19**	**1**	**1**	**47**
Operating Costs (HQ 10%)										**387**	**105**	**134**	**91**	**87**	**83**	**887**
Total Component Costs										**4,261**	**1,157**	**1,473**	**998**	**957**	**908**	**9,754**

Footnotes:

1 Emergency feed supplies to 18772 beneficiaries to feed 63199 large and small livestock.
2 Emergency veterinary medicines supply to 10% of cattle, Bufalo, goat and sheep population.
3 For treating round worms.
4 Injections applied by DLS employees.A lump sum of 2 million Taka is kept for transport and other cost.
5 5-day training for local brooders on bio-secure brooding local variety poultry.
6 Incdludes 3-month old chicken, 2Kg of feed, 1-day training + vaccine.
7 Includes 15kg feed, 1 week quarantine, vaccination cost and transport.
8 5-day course, conducted by DLS sub-dist. staff - costs (100/trainee, resource persons + other costs)
9 Includes basic purchased material with some training.

Annex 6 - Table 4: Detailed Costs for Component IV - Forestry Rehabilitation.

				Quantities								Value, in 000s US$								
	Take:US$ Exchange Rate	68		Year 1 - trimester				Year 2 - trimester				Year 1 - trimester				Year 2 - trimester				
	Items	Units	Unit Price	1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	Total
Sub-Component 1: Sundarbans Mangrove Forest Rehabilitation																				
Impact assessment, Monitoring and Evaluation of Sundarban eco-system & Wildlife																				
Assesment of ecological change through sattelite imageries																				
Sat. Images, interpretation and Verification	Set	26,471	2			1			1		453	-	-	226	-	-	226	-	906
Reporting, travel and other costs	LS										10	1	1	7	1	4	5	2	29
Subtotal											**463**	**1**	**1**	**233**	**1**	**4**	**232**	**2**	**935**
Vegetation Study and Monitoring on Regeneration, Ecological change,mortality, growth & vigour, change in site quality etc.																				
Data Collection and Analysis	LS										2	1	1	1	1	1	1	-	11
Travel and other Costs	LS										10	1	1	1	1	4	5	1	24
Subtotal											**13**	**3**	**2**	**3**	**2**	**5**	**7**	**1**	**35**
Study on Wild life and biodiversity, habitat, health and behaviour of wild life in Sunderbans																				
Data Collection and Analysis	LS										2	1	1	1	1	1	1	-	11
Travel and other Costs	LS										10	1	1	1	1	4	5	1	24
Subtotal											**13**	**3**	**2**	**3**	**2**	**5**	**7**	**1**	**35**
Tech. Assistance & other costs																				
International Consultant/ TA/1	Week	1,103	6			4			3		7	-	-	4	-	-	3	-	14
Travel	LS										44	-	-	44	-	-	44	-	132
Forestry National Consultant	Months	2,000	6	3		4	3		3	3	12	6	-	8	6	-	6	6	44
Training for DFO staff/2	Course	588	10			10			10		6	-	-	6	-	-	6	-	18
Subtotal											**69**	**6**	**-**	**62**	**6**	**-**	**59**	**6**	**208**
Infrastacture Rehabilitation in the Sundarbans																				
Repair of buildings in different stations	nos	1,471	6	10	6	8					9	15	9	12	-	-	-	-	44
Repair of drinking water facilities	nos	1,471	10	20							15	29	-	-	-	-	-	-	44
Repair of boats and dingis	nos	441	10	10	10						4	4	4	-	-	-	-	-	13
Repair of patrol boats/trawlers	nos	1,471		10	10						-	15	15	-	-	-	-	-	29
Repair of jeties	nos	441	10	10							4	4	-	-	-	-	-	-	9
Conostruction cyclone shelter/ office (10)	SqM	221			400	400	800	800	800	800	-	-	88	88	176	176	176	176	882
Conostruction cum cyclone shelter (10)	SqM	221			300	300	600	600	600	600	-	-	66	66	132	132	132	132	662
Drinking water Supply (pond exc. filter + tank)	Set	4,412		2		2	2	2		2	-	9	-	9	9	9	-	9	44
Water crarft, fibre glass engine boats	nos	44,118				2					-	-	-	88	-	-	-	-	88
Solar energy Instal. for new buildings	nos	1,471			2	2	4	4	4	4	-	-	3	3	6	6	6	6	29
NGO O&M Costs, @ 10%.											3	8	19	27	32	32	31	32	185
Subtotal											**36**	**84**	**204**	**293**	**356**	**356**	**346**	**356**	**2,030**
Sub-Component 2: Agro-Forestry Rehabilitation																				-
Home-based Nursery Development/4	Person	74	1,000	1,000	1,000	1,000					74	74	74	74	-	-	-	-	294
Training to Men and Women/5	Person	12	4,000	2,000	2,000						49	24	24	-	-	-	-	-	98
Embankment Plantation/6	KM	1,335		100			200				-	133	-	-	-	267	-	-	400
Railway and Highway plantation/6	KM	706		400			600				-	282	-	-	-	424	-	-	706
Feeder Road Plantation/6	KM	353		800			1,200				-	282	-	-	-	424	-	-	706
Foreshore Afforestation(Spardike System)/7	Ha	2,074		28			50				-	58	-	-	-	104	-	-	162
Mangrove Afforestation/6	Ha	117				500					-	-	-	58	-	-	-	-	58
Non-Mangrove Afforestation	Ha	338		100			200				-	34	-	-	-	68	-	-	101
Institutional Capacity Building																				-
Civil Works Office/Cyclone Shelter/8	SqM.	221		1,200	1,200	1,800	1,800	1,800	1,800		-	265	265	397	397	397	397	-	2,118
Repair off Existing Buildings	LS										51	51	-	-	-	-	-	-	103
Repair of Water Crafts	NO.	1,471	6	6	6						9	9	9	-	-	-	-	-	26
Jetty Repairs	NO.	1,103	10								11	-	-	-	-	-	-	-	11
Monotoring and supervision of plantations/9	LS										6	6	6	6	6	-	-	-	29
NGO O&M Costs, @ 10%.											20	122	38	53	40	168	40	-	481
Subtotal											**220**	**1,341**	**415**	**588**	**443**	**1,850**	**437**	**-**	**5,294**
Tech. Assistance & other costs																				
Technical Backstopping/10	Week	1,103	4		3			3			4	-	3	-	-	3	-	-	11
Travel/11	LS										3	-	3	-	-	3	-	-	9
Subtotal											**7**	**-**	**6**	**-**	**-**	**6**	**-**	**-**	**20**
Direct Operating Costs (HQ: 10%)											82	144	63	118	81	223	109	37	856
Total Component Costs											**901**	**1,581**	**693**	**1,301**	**891**	**2,449**	**1,196**	**402**	**9,415**

Footnotes: as much explanation as appropriate.

1 Includes, Honorarium @$717/working day, and DSA @ $150/day

2 3-day course, 20 trainees/course, costs include resoruce people, expenses, DSA + other

3 Includes Office equipment - furniture, computer and other costs.

4 Includes, costs of seeds, fertiliser, poly bags and material for nursery bed.

5 4-day course in Nursery dev. and tree planting and management (T100/day/participant, 30 participants/course, T240/course 2 resource perssons. T.100/person/day other costs)

6 Costs include seedlings of various species, planting and maintenance.

7 Palm trees, costs include seedling costs, planting and maintenance.

8 A total of 13 new buildings for office and cyclone shelter.

9 Includes budget support to DFO at district level to better monitor and maintain the newly afforestated areas.

10 Includes, Honorarium @$717/working day, and DSA @ $150/day

11 Includes Travel (@ US$ 3000 per year)

12 Includes, office furniture, computer and O&M

- Close coordination and cooperation with FAO staff, Emergency Programme Coordinator at national level, Emergency Field Coordinator at Division/District level and technical staff at Upazila and community levels;
- Facilitates regular monitoring visits to the sites by FAO programme staff, field and programme coordinators and any other person assigned by the FAO;
- Coordinates and cooperates closely with relevant government departments, where required, at District, Upazila and community levels; and
- Provides regular activity and financial reports to the Emergency Field Coordinator (at District level) and to Emergency Programme Coordinator (at national level), in line with FAO standards and agreed processes.

Misunderstandings and disagreements will be resolved with FAO team at Division/District level, as far as possible, the Emergency Programme Coordinator in Dhaka will be requested to intervene, where required.

Annex 6 - Table 5: Detailed Costs for Component V - Programme Implementation Support

Items	Units	Unit Price	Quantities								Value, in 000s US$								Total
			Year 1 - trimester				Year 2 - trimester				Year 1 - trimester				Year 2 - trimester				
			1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	1 -3	4- 6	7- 9	10 - 12	
International Consultants																			
Emergency Programme Coordinator/1	Month	10,000	3	3	3	3	3	3	3	3	30	30	30	30	30	30	30	30	240
Emergency Field Coordinator/2	Month	10,000	3	3	3	3	3	3	3	3	30	30	30	30	30	30	30	30	240
Fisheries Expert2	Month	11,000	3	3							33	33	-	-	-	-	-	-	66
Travel Int. Consultant -once/year	LS	4,000	3				3				12	-	-	-	12	-	-	-	24
Subtotal											**105**	**93**	**60**	**60**	**72**	**60**	**60**	**60**	**570**
National Staff																			
Assistant Coordinator-Dhaka/1	Month	1,000	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	24
Finance/Procurement Officer/3	Month	800	6	6	6	6	6	6	6	6	5	5	5	5	5	5	5	5	38
Agronomist/Seed Specialist/2	Month	1,500	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	36
Livestock Officer/2	Month	1,500	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	36
Fisheries Officer/2	Month	1,500	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	36
Forestry Officer/2	Month	1,500	3	3	3	3	3	3	3	3	5	5	5	5	5	5	5	5	36
Computer Operator	Month	400	3	3	3	3	3	3	3	3	1	1	1	1	1	1	1	1	10
Driver/3	Month	300	6	6	6	6	6	6	6	6	2	2	2	2	2	2	2	2	14
Office Assistant	Month	200	6	6	6	6	6	6	6	6	1	1	1	1	1	1	1	1	10
Guard	Month	200	6	6	6	6	6	6	6	6	1	1	1	1	1	1	1	1	10
Subtotal											**31**	**31**	**31**	**31**	**31**	**31**	**31**	**31**	**250**
Non-Expendable Equipments (Office)																			
Vehicle (4x4 Wagon)	Units	35,000	2								70	-	-	-	-	-	-	-	70
Computers, Printers and Peripherals	Set	2,200	10								22	-	-	-	-	-	-	-	22
Photocopier	Set	1,500	2								3	-	-	-	-	-	-	-	3
Furnitures/4	Set	1,100	10								11	-	-	-	-	-	-	-	11
Communication, Cellphones, Radio etc.	LS										10	5	2	2	2	2	2	2	27
Subtotal											**116**	**5**	**2**	**2**	**2**	**2**	**2**	**2**	**133**
General Operating Expenses																			-
Vehicl Hire/5	Month	662	6	6	6	6	6	6	6	6	4	4	4	4	4	4	4	4	32
House Rent in Barisal	Month	600	3	3	3	3	3	3	3	3	2	2	2	2	2	2	2	2	14
Other oeprating costs	LS										6	6	6	6	6	6	6	6	48
Subtotal											**12**	**12**	**12**	**12**	**12**	**12**	**12**	**12**	**94**
Operating Costs (HQ 10%)											**26**	**14**	**10**	**10**	**12**	**10**	**10**	**10**	**105**
Total Component Costs											**290**	**155**	**115**	**115**	**129**	**115**	**115**	**115**	**1,151**

Footnotes: as much explanation as appropriate.

1 Based in Dhaka

2 Based in Barisal

3 One in Barisal and one in Dhaka

4 Includes desk, chairs, shelves, meeting table set, sofa set etc.

5 Includes, Driver + fuel and maintenance X 2 cars for the field.

Summary Costs by Component and Activity								
	In '000 US $			In '000US $ Funds Committed So far by Donors			In 000s US$	
Component/ Activity	Year 1	Year 2	Total	CERF	Belgium	Swiss	Gap 1st 12 months	Uncovered Gap
I. Fisheries Component								
Emergency Input Supply to Aquaculture restocking	2,063	1,452	**3,515**		350		1,713	3,165
Capture Fisheries Rehabilitation	4,220	4,840	**9,060**	150			4,070	8,910
Other Costs/1	628	629	**1,257**				628	1,257
Sub-Total Fisheries	**6,911**	**6,921**	**13,832**	**150**	**350**	**-**	**6,411**	**13,332**
II. Agric. Component - Crops.								
Vegetable seeds/seedling	830	100	**929**	103		180	547	646
Field Crop and Fertilizers	13,045	-	**13,045**	450	650		11,945	11,945
Pulses/Bean Seeds	90	-	**90**				90	90
Non-Expendable Equipts (150 ICM Clubs)	2,644	-	**2,644**				2,644	2,644
Other Costs/2	3,499	29	**3,528**				3,499	3,528
Seed Rehab/Dev. (5-year project)		1,979	**1,979**				-	**1,979**
Sub-Total Agriculture component II	**20,108**	**2,107**	**22,215**	**553**	**650**	**180**	**18,725**	**20,832**
III. Livestock Component								
Emergency Feed and Veterinary medicine	2,902		**2,902**		235		2,667	2,667
Restocking (Poultry, goats, sheep, buffalo)	3,635	1,691	**5,326**				3,635	5,326
Support to cold chain development in 32 sub-districts	103		**103**				103	103
Assistance to improved livestock shelter	488	2	**490**				488	490
Other Costs	762	172	**934**				762	934
Sub Total	**7,889**	**1,865**	**9,754**	**-**	**235**	**-**	7,654	**9,519**
IV. Forestry Component			**-**					
Sundarband Bio-Div.&Habitat M&E.	875	339	**1,215**					
Sundarban Infrastracture Rehab.	616	1,414	**2,030**					
Agro/Social Forestry Rehab.	2,578	2,737	**5,314**					
Training Costs	407	449	**856**		10			
Sub-Total Forestry Rehab.	**4,476**	**4,939**	**9,415**		**10**		**4,466**	**9,405**
V. Implementation Support								
Contracts/LoA for NGOs, etc.				71	100			
Technical Assistance				32	75			
International Consultants + Consultants + Travel	318	252	**570**	74	180			
National Staff	125	125	**250**	25	96			
Non-Expendable Equipments (Office)	125	8	**133**		21			
General Operating Expenses	109	90	**199**	30	101			
Direct Operational Costs	3,938	1,583	**5,522**	65	182			
Sub-Total Forestry Rehab.	**4,615**	**2,058**	**6,673**	**297**	**755**		**3,563**	**5,621**
Total Prog. Costs	**43,999**	**17,891**	**61,889**	**1,000**	**2,000**	**180**	**40,819**	**58,709**

ANNEX 7

SOCIAL AND GENDER ISSUES

A. GENDER DIVISION OF LABOUR AND VARIOUS FORMS OF DISCRIMINATION IN SECTORS

In Bangladesh women constitute 48.6% of total population (BBS, 1995). About 92% of the households are male-headed and the remaining 8% female-headed (ESCAP, 1995). The sex ratio in Bangladesh is such that there are 106 men per 100 women. In urban areas there is a predominance of the male population, particularly in large towns. But in the rural areas there is a predominance of female population and the female-headed households. This is due to higher male out-migration from the rural areas to urban and abroad for seeking employment opportunities (ESCAP, 1995).

Women, who primarily work as unpaid family workers, accounted for 45.6% of total employment in agriculture. A large majority of the households in Bangladesh depend upon agriculture and related activities like rearing of livestock, fisheries and forestry. (BBS, 1995) The farm households activities done by women such as care of livestock and poultry, vegetable growing, post-harvest processing and preservation, are considered uneconomic.

In addition to routine domestic work, women in rural Bangladesh are in general responsible for most of the agricultural work in the homestead. Farm activities in the homesteads, ranging from selection of seed to harvesting and storing of crops, are predominantly managed by women.

Among poor households, there is no clearly demarcated gender division of labour. The traditional gender relations with women's involvement in post-harvest work and men's in fieldwork have not remained static over time. Presently, due to extreme poverty and a food crisis, social norms and traditions are changing and women are appearing in the field as well (Shirin, 1995). About 60-70% of women from landless and near-landless households work as agricultural wage labourers, whereas women from larger farms do not participate in field activities (Jahan, 1990). In the working areas of Grameen Krishi Foundation in North-West, women equally share all tasks in rice production, even the presumably male task of irrigation (Jordans and Zwatreveen, 1997).

Forests are limited to 14% of the total land area in Bangladesh. Women use the forest products for food, fuel as well as for handicrafts. Women in rural Bangladesh are responsible for obtaining the household fuel supply. They collect firewood from the forests. A traditional role of Bangladeshi women is collecting cow dung for fuel from the forests which are the largest source (6.6 million ton or 26% in 1992-93) of traditional fuels in the unorganized sector (BBS, 1995). Women also play a substantial role in homestead/social forestry.

Women in Bangladesh have diversified roles in fisheries, with substantial participation in small-scale fisheries. In Barisal and Rajashahi districts, women catch fish, carry out the drying, curing, and marketing of fish as hawkers, stall keepers in permanent market places and weekly bazaars. Women are also predominantly involved in net-making, the main income generating occupation in many families, and freshwater fish farming (FAO, 1980). In some NGO and government programmes, women from landless households cultivate fish individually or jointly in leased ponds, either within or near the homestead (Jahan, 1990).

Approximately 30,000 workers are employed in shrimp processing factories in Chittagong and Khulna over 60 percent of whom are women. They are working at lower level with poor salary and benefits. The work is laborious and repetitive with health concerns (arthritis, urinary tract infections, repetitive strain, and diarrhea due to cool, infection to

hands/feet due to damp work environments, stress, and exposure to parasites). There have been numerous complaints about the working conditions including violation of the 8 hour workday; forced and unpaid overtime; failure to provide healthcare, childcare, and maternity leave; failure to observe the right to organize; as well as health and safety violations. There are cases of harassment as well.

Fry (Post Larvae/PL) collectors are very important segment in the value chain. Approximately 425,935 individuals caught fry through the surf in 2005. A little over 40 percent of all fry catchers are men, 30 percent women, and another 30 percent girls and boys. Lacking land and assets, the fry collectors are the most vulnerable workers along the chain. Many spend years locked in a cycle of debt and earn little more than $1 per person per day for five to six months of the year, which is the main subsistence of the family. Though this activity has been banned by the Government of Bangladesh for resource/environmental conservation, this very poor section of the community never refrained from fry catching for two main reasons: firstly, they do not have any alternative livelihood; secondly there is continuous demand from the farmers, depo-holders and other entrepreneurs. Involvement of women in other components of value-chain is shown in table 1 in Annex. But the table 2 shows the increasing participation of women in shrimp-farms.

There are approximately 150,000 farms producing shrimp and prawn, and employing over 600,000 workers. Many of these workers are unremunerated family members (women) while others are hired for temporary or seasonal work (GATE, 2006). There is increasing evidence of women participation in shrimp farming. 50 to 96 percent of women perform the activities like pond re/excavation, food preparation, day guarding the nursery, pond cleaning/de-weeding and harvesting. 50 to 93 percent women cultivate vegetables on the dike and sell those at a local level to the whole-sellers (Gendered monitoring report, SQSP2, WorldFish Center, 2007).

In Bangladesh, women are in general responsible for livestock and poultry rearing. Poultry rearing is a traditional activity performed by women for income generation. Feeding livestock, cleaning sheds, securing them properly for the night, and health care are the activities performed by women. Men are involved in the heavy work with the animals such as taking them out of the compound. Owing to their crucial role in livestock care, women are generally consulted while buying and selling the livestock (Abdullah and Zeidenstein, 1982). Women take care of the farmyard manure collection thus reducing recycling, which has important consequences for soil fertility.

B. BACKGROUND OF THE REHABILITATION PROJECTS

Thirty districts of the country were affected by the cyclone Sidr on November 15, 2007. There was loss of thousands lives along with huge damage across the four sectors of agriculture: forestry, fisheries, livestock and crops. With the request of the Government of Bangladesh an inter-sectoral FAO Mission visited the cyclone affected areas during 7 to 15 December 2007. The Mission rapidly assessed the damage of each sector and prepared a two-year comprehensive emergency rehabilitation programme for the cyclone affected areas covering immediate and medium term disaster mitigation and risk reduction. The brief analysis of social and gender safeguard measures of four proposed programmes are given below.

B.1. Fisheries

The main activities of this sector are divided into two main sub-components: aquaculture and marine fisheries (capture). A total of 5,000 beneficiaries of the affected areas will get rehabilitation support. There are only few recent surveys on gendered dimension on shrimp culture but none on other sub-components. The selection criteria of the beneficiaries have prioritized female-headed households (WHHH).

Each of the two sub-components has the following activities:

(i) Aquaculture

A package of fry, feed, fertilizer and lime will be provided to each beneficiary.

- Pond culture for carp and *Gher* for shrimp culture – 30% of the beneficiaries will be female.
- Food for Work/Cash for Work (supported by WFP) support to be linked for the WHHH, who can not afford HH labour.

(ii) Open water capture

Two types of boats with gear will be provided to resource poor fisher-folk who were working as labourers on the boats owned by depo-holders or troller owners. Due to the lack of any baseline data, the proportion of loss or damage was difficult to assess and the number of target beneficiaries could not be precisely calculated.

- 25-30 ft boat and 1 set gillnet (a group of five).
- 35-40 ft boat with engine and 1 set gillnet (a group of ten).
- Safety at sea and communication materials with improvement of existing vessels for fisher-folk.

Although women have indirect involvement in open water fishing the rehabilitation support will be provided to resource poor fishermen as their main livelihood. They are ready to start the work within next month but have lost all their equipments in the cyclone. They used to earn Tk 50 to 150 per day during the off and peak season.

Another group of women are working as wage labourer in the landing place for sorting fish for icing, selling and drying at local level. Due to heavy loss of boats and gears the quantity of fish landing reduced in most places, As such their daily income also reduced to marginal level.

No rehabilitation program is designed for the above-mentioned women groups. They are surviving with the relief, food /cash for work and waiting to resume their livelihood (and their husbands) on fishing and alternative livelihood.

The third group of floating/sea Nomads (lives on boats) was found, who are marginal have lost their lives, and boats with other assets were deprived of any relief or other assistance as they have no permanent address. A survey is needed for complete information. Skills on alternative livelihoods for small fisher-folk will be supported by ILO.

Details are given in the project proposal of Fisheries consultant.

B.2. Livestock

There is massive loss of poultry and cattle's in the severely affected area. Buffalo did not suffer much due to its capacity to float in water. Total number of beneficiaries targeted in the rehabilitation programme (195 unions of 23 upazilas of four severely affected districts) is 80,300. Seventy five percent of them will be women and rests are men. As the rural women have natural way to rear chicken/duck or goat/sheep at family level and/or commercial scale, each woman beneficiary will get any one: poultry or small ruminants.

(i) Poultry

Restocking of chicken will be done very carefully from local level, considering the high risk of AI. A package of chicks/ducks, feed and medical care with vaccination will be provided to women. In medium term program women will also receive training and improved housing (mobile).

(ii) Goat

The alternative livelihood support for women will be she goat/sheep (5-6 months old) along with feed, medical care and vaccination. Training and housing will be provided as the other groups.

(iii) Cattle

Some 25% of beneficiary men will get necessary technical support for cattle, such as training, vaccination and artificial insemination.

(iv) Cyclone Shelters (*Killa*)

Cyclone shelters will be developed for all livestock beside the multi-purpose cyclone centre for human being to ensure safety of these valuable assets. Improved cattle shed will be designed and prepared for all. Specific details are given in the project proposal of the livestock consultant.

B.3. Forestry

The vast affected area of Sunderbans has in-lieu saved human life and protected the physical damage of other sectors. Loss of social forests (both timber and fruits) is rampant in all affected areas, which has gender implications.

(i) Sunderbans

Sunderban damage will not be intervened as per government's decision to observe the natural way to regeneration.

However, there will be some interventions like:

- New infrastructure development with life saving measures and improved communication system. The damaged buildings of forest department will be repaired.
- Capacity building of the staff on biodiversity M&E.
- The lost livelihood of men within the Sunderbans will be tried to compensate through alternative livelihood support of ILO.

(ii) Agro/Social Forestry

- Home-based nurseries will be provided to 4,000 women with inputs.
- Training will be provided to 8,000 men and women (50:50).
- Plantation of coastal belt (300 km) embankments, roads, railways and institutions.
- Fuel efficient boats and gears for patrol and monitoring.
- Repair of building and landing stations.

Details are given in the project proposal of forestry consultant. There should be more women's participation in the plantation of coastal belts, embankments, roads, railways and institutions and the daily wage labour/beneficiary equivalent to men.

B.4. Crops/Cereals and Vegetables

The severe damage of main crops and vegetables along with loss of farm power and irrigation channels in all affected area is leading to risk of food insecurity, loss of livelihood of both men and women and other inter-sectoral problems (e.g. fodder). Separate interventions are planned for two sub-components focusing all households (small, marginal and landless) including WHHH (estimated to be 30% -40%). The total number of beneficiaries of all four severely affected areas is 108,259 households (marginal, small and landless).

- Seedlings/saplings for horticultural crops e.g. banana, will be distributed to households with orchard gardens and others.
- Cereal crops seeds, especially Aus and Amon rice and pulses *(khesari)* will be distributed to marginal and small farmers in February and June, with adequate quantities of fertilizer to enhance good yield.
- Vegetable seeds will be provided to landless households; each HH will get a package of at least 3 sachets of vegetable seeds (different size as per seed rate). Different types of seeds are planned: amaranthus, sweet gourd, brinjal, cucumber, kang kong, watermelon, lady's finger and Indian spinach.
- Power tiller, thresher, irrigation pump and other equipments will be provided through IPM/ICM clubs.
- Seed storage containers will be provided to each HH for preserving of grains seed; IPM/ICM club will be strengthened through training to manage seed storage and farm equipments.

The program support is HH based with emphasis to WHHH. To safeguard social system, vegetable seeds for landless HH should be provided to women as they usually take the main responsibility of homestead garden.

Details are given in the project proposal of Agronomist and that of the Seed Consultant.

For all types of on-farm and off-farm wage labour there is persistent problem of discrimination between men and women. While implementing the projects there should be attention to eliminate the discrimination.

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Appendix 1

Table 1: Segmentation by Sex along the Value Chain of Shrimp

	Person Days Per Year			
	Men	**Females**	**Total**	**Female %**
Fry Catcher	3721	**2384**	6105	**39.0**
Fry Aratdar /Faria	-	-	-	-
Shrimp Farmer	35028	**786**	35814	**2.2**
S Faria	-	-	-	-
S Aratdar	11650	**183**	11833	**1.5**
Commission Agent	37	0	37	0.0
Shrimp Nursery	600	0	600	0.0
Shrimp Hatchery	6288	**120**	6408	**1.9**
Transporter	127	0	127	0.0
Retailer & Wholesaler	4	0	4	0.0
Processor & Exporter	25790	**42483**	68273	**62.2**
S Trawler	10	0	10	0.0
Cargo Biman	50	0	50	0.0
Input dealer	-	-	-	-
Commission Agent (MS)	4	0	4	
Total	83,309	**45,956**	129,265	**35.6**

Source: a pro-poor analysis of the shrimp sector in Bangladesh, Gate Project, USAID, February 2006.

Table 2: Women's Participation in Shrimp Farming Activities

Activities of Shrimp Farming	Women's Participation in Farming (%)					
	Total work	75% of total	50% of total	25% of total	Total persons (%)	**Total # women**
Kathi Karapara, Sadar, Bagerhat						
Pond excavation/ re-excavation	1	2	10	2	15 (50)	**30**
Fertilizing/Liming	1	1	2	1	5	
Fry purchase	0	0	0	0	-	
Stock /fry release	3	2	6	0	11 (36.3)	
Pond cleaning & de-weeding	4	1	2	0	7	
Prepare food	4	2	3	0	9 (30)	
Prepare water	4	1		0	5	
Harvest	5	7	5	0	17 (56.7)	
Sale fish	2	2	4	0	8	
Guard the nursery	3*	2**	1***	1	7	
Cultivate vegetable	11	6	7	4	28 (93.3)	
Sale vegetable	8	7	7		22 (73.3)	

...cont./

/cont.

Surigati, Chitalmari, Bagerhat						
Pond excavation/re-excavation	1	2	6	6	15 (50)	**30**
Fertilizing/Liming	1	-	-	-	1	
Fry purchase	-	2	-	-	2	
Stock /fry release	1	-	-	8	9 (30)	
Pond cleaning & de-weeding	1	5	6	6	18 (60)	
Prepare food	29	-	-	-	29 (96.7)	
Prepare water	1	6	10	5	22 (73.3)	
Harvest	-	1	5	4	10 (33.3)	
Sale fish	-	1	1	-	2	
Guard the nursery	1	-	-	-	1	
Cultivate vegetable (dike)	10	5	-	-	15 (50)	
Sale vegetable	-	15	-	-	15 (50)	

**Day & night, **day & part of night, ***only daytime.*

Source: Gendered monitoring report, N Jahan, SQSP2, WorldFish Center (being published) 2007.

Annex 8: Monitoring and Evaluation Suggested Indicators
Component I: Support to Fisheries Rehabilitation

Overall Objective: Poverty Reduction Through Conservation of Resources and Environment

Specific Objective/Outcome 1: Reduce Fishing on Near-Shore Resources through Increased Mobility of Artisanal Fleet and Increased Safety at Sea
Specific Objective/Outcome 2: Improved Capacities and Organisations Among Fisher Groups for Sustainable Livelihoods
Specific Objective/Outcome 3: Restore Livelihoods of Small-Scale Aquaculture Fishfarmers

Activities	Input Indicators	Means of Verifcation	Output Indicators	Means of Verifcation	Source of Data	Frequency of Data Collection	Use of Collected Data
Activity 1: Survey Coastal Fisheries & Floating Families/Sea Nomads; Capacity Building & Organisation Development & Introduction of Improved Fishing Gears and Vessels	A survey of coastal fisheries will be finalised by month 12 of year 1; Some 35000 smallholder fishing households will be trained in group formation & new fishing vessels & technologies by month 12 of year 1; 400 small & 150 medium improved fishing vessels distributed to groups of newly organised fishermen by month 12 of year 2	Project approved, technical staff & resources mobilised by month 1-2; survey forms prepareed & approved by month 3; actual survey of coastal fisheries started by month 4 and results/findings published by month 9; gorup formation and training started by month 6; procurement of material and training of boat builders for new boat designs finalised by month 3; production of first boats by month 5; actual distribution of new vessels & gears started by month 6	Improved knowledge-base & baseline data established for effective/improved planning for the sector; smallholder fishing households resumed their livelihood activities	The Department of Fisheries & the current project makes extesnive use of the survey data for planning purpose in coastal fisheries; 35000 small-scale fishing households have started productive fishing activities	Survey findings report; list of beneficiaries established by implementing partner; list of beneficiary groups with new fishing gears & vessels by implementing partner & project staff, reports by the Department of Fisheries; regular project progress & monitoring reports; post-training & distribution assessment reports by implementing partner and project staff	Weekly/bi-weekly in the initial stage, monthly thereafter; quarterly progress reports; end of the year reports	Monitoring project progress; avoiding diversion from project plans; Project monitoring process; internal & external evaluations
Activity 2: Rehabilitation and Restocking of and Training and Capacity Building for Aquaculture	36000 aquaculture packages & essential training provided to smallholding fish farmers by month 6 of year 2	Project approved, technical staff & implementing partner mobilised by month 1-2; Technical needs assessment carried out by month 3; beneficiaries selected by month 4; beneficiaris received training by month 5-8; iputs procurement finalised by month 12; distribution of inputs started by month 1 of year 2 & continued by month 4 of year 3	Smallholding aquaculture fish farmers resumed their livelihood activities	36000 smallholding aquaculture fish farmers have been trained, cleaned their fish ponds and started productive farming in the season February-June 2009	Reports of technical needs assessment; lists of beneficiary selection & distribution of inputs by implementing partner & project staff; reports of the Fisheries Department; regular project progress & monitoring; post-distribution asesment reports by implementing partner & staff	Weekly/bi-weekly in the initial stage, monthly thereafter; quarterly progress reports; end of the year reports	Monitoring project progress; avoiding diversion from project plans; Project monitoring process; internal & external evaluations

Annex 8: Monitoring and Evaluation Suggested Indicators

Component II: Support to Agriculture Rehabilitation

Overall Objective: Protection and Rehabilitation of Agriculture- Based Livelihoods

Specific Objective/Outcome 1: Improved Livelihoods & Household Diet
Specific Objective/Outcome 2: Increased Food Production
Specific Objective/Outcome 3: Improved Community-Based Capacity and Organisations; Enhanced Agriculture Farming System

Activities	Input Indicators	Means of Verifcation	Output Indicators	Means of Verifcation	Source of Data	Frequency of Data Collection	Use of Collected Data
Activity 1: Emergency Response for Horticulture Crops Rehabiliation in 5 most-affected districts	300,000 fruit trees, 500,000 banana suckers & 20,000 beetle leaf seedlings, 136,411 vegetable seed packages distributed by the end of month 3, beneficiaries trained in improved horticulture	Project approved & staff hired by month 2; technical needs assessment by month 3; Tender by month 4; quality test & supplies procured by month 5; inputs distributed by month 6	Landless and small farming households resumed hoticulture-based farming activities and their agriculture-based livelihoods restored	176,802 homestead fruit gardens re-established; 136,411 homestead vegetable gardens, mainly by women, re-established	Results of technical needs assessment; Delivery of inputs by the private sector contractors; Reports of training sessions; beneficiary lists established by NGOs; Distribution lists compiled by project staffRegular project reports	Weekly during initial emergency phase, monthly thereafter; postdistribution assessment month 10-11	Monitoring project progress; avoiding diversion from project plans; Project monitoring reports; internal & external evaluations
Activity 2: Rehabilitation of rice production in 5 most-affected districts	1.1715 tons of Aman rice seed, 3.1712 tons of Urea, 1.0572 tons of TSP, & 1,0572 tons of fertliser distributed	Project approved & staff hired by month 1; technical needs assessment by month 2; Tender by month 3; quality test & supplies procured by month 4; inputs distributed by month	Small rice farming households resumed immediate rice cultivation and restored agriculture corp-based livelihoods	211,398 small rice farming households received and planted Amon rice for the next season	Results of technical needs assessment; Delivery of inputs by the private sector contractors; beneficiary lists established by implementing partner; Distribution lists compiled by project staff; regular project reports	Weekly during initial emergency phase, monthly thereafter; post-distribution assessment month 9-10	Monitoring project progress; avoiding diversion from project plans; Project monitoring reports; internal & external evaluations
Activity 3: capacity building & improved agricultural farming system	600 power tiller, 600 thresher, 600 irrigation pump, 600 sprayers, 300 batch dryers & 300 weighing scales distributed; 100 warehouses repaired & 10 new warehouses built; Group formation and use of farm machinery training delivered	Project approved, staff hired month 6; tender call for machines and equipment month 7; material an d equipment procured in month 9/10; ICM representatives trained & farm tools & equipment distributed in month 10; plant operations monitored and additional training delivered in month 11/12	Integrated Crop Management (ICM) Clubs resumed agriculture-based livelihood activities with improved production systems	4500 members of 150 ICM clubs in four worse-affected districts received new farm machines and equipment, trained in group formation and appropriate use of newly acquired agriculture machines and tools; repaired and newly built warehouses utilised for harvest, seed, fertiliser and equipment storage	List of target ICM clubs established by implementing partner and project staff, certified by relevant authorities; report of needs assessment by project staff; delivery reports of material and equipment by private sector and implementing partner; construction report by contractors and project staff; report of training sessions; and post-distribution report by project	Weekly during initial emergency phase, monthly thereafter; post-distribution assessment month 2-3 in year 2	Monitoring project progress; avoiding diversion from project plans; Project monitoring reports; internal & external evaluations

Annex 8: Monitoring and Evaluation Suggested Indicators
Component III: Support to Livestock & Poultry Rehabilitation
Overall Objective: Protection and Rehabilitation of Livestock-Based Livelihoods

Specific Objective/Outcome 1: Reducing the Risk of Further Animal Losses, Securing Most Vulnerable Groups Livelihood Assets
Specific Objective/Outcome 1: Reducing Poverty Among Most Vulnerable Groups of Rural Communities
Specific Objective/Outcome 2: Increasing Productive Livelihood Assets of Landless, Women & Female-Headed Households

Activities	Input Indicators	Means of Verifcation	Output Indicators	Means of Verifcation	Source of Data	Frequency of Data Collection	Use of Collected Data
Activity 1: Support to emergency animal feed and medical supplies	3906 tons of animal feed distributed by month 3 and essential medicine and vaccination supplies distributed by month 6	Project approved by month1; implementing partners selected by month 2; technical needs assessment by month 3; procurement of supplies by month 4; and distribution of feed by month 3 and of medicine and vaccines by month 6	Landless farmers, women and female-headed households restored their livelihood activities and re-established small-scale animal and poultry farms; emergency veterinarian teams of the Livestock department are equipped with basic medical supplies	18772 landless and small-scale animal farmers with 63199 animals have access to fooder for a period of 3 months; Emergency veterinarian teams in 32 Upazilas have access to basic medical supplies	Results of technical needs assessment; Delivery of inputs by the private sector contractors; beneficiary lists established by NGOs; Distribution lists compiled by project staff; Regular monitoring project reports	Weekly in the initial stage of the programme, especially during meergency phase, monthly thereafter; post-distribution report at the end of delivery of project goods and services	Monitoring project progress; avoiding diversion from project plans; Project monitoring reports; internal & external evaluations
Activity 2: Restocking Livestock and Poultry	1248 cows, 763 buffalos, 6127 goats, 1412 sheep, 6150 chicken, and 3072 ducks distributed by month 4	Project approved by month1; implementing partners selected by month 2; group formation & technical assessment by month 3; procurement and certification of animal and poultry by month 4; and distribution by month 5	Landless farmers, women and female-headed households restored their livelihood activities	Some 11425 most vulnerable households, specially landless and female-headed households have re-established small-scale productive poultry farms and livestock activities	Results of technical needs assessment; beneficiary lists established by NGOs; Delivery of animals and poultry by the private sector contractors; Distribution lists compiled by project staff,Regular project monitoring reports	Weekly in the initial stage of the programme, especially during meergency phase, monthly thereafter; post-distribution report at the end of delivery of project goods and services	Monitoring project progress; avoiding diversion from project plans; Project monitoring reports; internal & external evaluations
Activity 3: Capacity building and training for animal and poultry cyclone shelter; Development of a sustainable cold chain system; & repair of commercial farms	5000 benefieciaries trained through demaonstration samples to build safe cyclone and flood shelter for animals and poultry by month 9; 32 freezers and 864 ice boxes both of different sizes will be supplied by month 10 through to month 6 of year 2; 424 animal and 2962 poultry farms repaired by end of year one	Project approved, implementing partner selected, and type of shelter selected by month 3; Training delivered by month 4-5; procurement procedures finalised by month 9 and initial cold chain equipment delivered by month10; Needs assessment for repairs by month 6, completion by month 12	Small-scale animal and poultry farmers apply newly acquired techniques for the protection of their animal and poultry from cyclone and floods; Veterinary team of the Livestock Department utelise newly acquired improved cold chain equipment; Commercial animal & poultry farms restored and rehabilitated	5000 trained community members (direct beneficiaries) apply new skills in improved animal and poultry cyclone shelter & encourage others to follow suit; Animal and poultry farmers in 32 Upazilas have access to improved medical and vaccination supply system; 424 animal and 2962 commercial farms resume regular production and marketing of livestock products	Trainees list established by implementing partner and project staff; list of trained beneficiaries by training source and project staff; regular activity reports by the department of livestock, venetrinary unit and reports from livstock and poultry farming community members; Assessment & repair reports of the damaged farms by project staff and implementing partner	Weekly in the initial stage of the programme, especially during meergency phase, monthly thereafter; post-distribution report at the end of delivery of project goods and services	Monitoring project progress; avoiding diversion from project plans; Project monitoring reports; internal & external evaluations

Annex 8: Monitoring and Evaluation Suggested Indicators

Component IV: Support to Forestry Rehabilitation

Overall Objective: Support Government of Bangladesh Adaptive Measure Against Climate Change to Reduce Poverty & Vulnerability in Coastal Zone

Specific Objective/Outcome 1: Reduce Poverty by Generating Supplemntary Income Opportunities in Coastal Areas
Specific Objective/Outcome 2: Support Adaptive Measures to Climate Change and Reduce Vulnerability in Coastal Zones through Increased Forests; Reduce Loss of Lives & damage to Properties by Cyclones & Tidal Surges & Protect & Improve Coastal Zone Livelihoods
Specific Objective/Outcome 3: Build Viable Community Capacities & Institutions & Generate Supplementary Income Opportunities for the Landless and Poor through Social Forestry

Activities	Input Indicators	Means of Verifcation	Output Indicators	Means of Verifcation	Source of Data	Frequency of Data Collection	Use of Collected Data
Activity 1: Capacity Building & Institution Development for Effective Monitoring & Assessment of the Sunderbans	50 Office/residential buildings repaired and/or consutructed; 40 water ponds with sand filter cleaned, 20 solar energy systems installed in new facilities by month 6; 52 boats repaired and/or purchased new, 1 vehicle delivered by month 6; natural regeneration of Sunderbans supported with seedlings for up to 5000 ha during first and second year; cyclone impact of vegetation & ecosystem studied over 12 months; cyclone impact on biodiversity & wildlife studied over 10 months	Project approved & technical expertise mobilised by month 1; procurement of material & equipment finalised by month 3; construction & delivery of goods started by month 4; seedlings preparation started by month 4	Department of Forest equipped with all necessary facilities, transport & equipment & material; an effective assessment & monitoring system established	50 cyclone-prove office cum shelter facilities have been utelised by the relevant staff of Forest department, water & energy facilities restored, & monitoring and assessment work in Sunderbansimprov ed through improved mobility and improved facilities	Findings of technical needs assessment reports; Reports of completion of infrastructure & delivery of transport & other goods; Regular project progress & monitoring reports by project staff & Forest Department; Post-completion assessment report	Bi-weekly during the initial stage, monthly & quarterly thereafter	Monitoring project progress; avoiding diversion from project plans; Project monitoring process; internal & external evaluations
Activity 2: Capacity Building & Institution Development for Social Forestry & Homestead Nurseries	Training of 8000 men & women in homestead nursery by month 12; provision of basic nursery packages for 4000 women trainees by month 12; provision of basic tools, seeds and seedlings for social forestry in 13 districts	Project approved & staff hired by month 1; target districts & beneficiaries selectyed by month 2-3; training manual developed & resource persons hired by month 2; actual training strated by month 3; nursery packages procured by month 3 & delivered to first batch trainees by month 4; technical assessment & beneficiary selection for social forestry by month 3-4; basic training and signing agreements with beneficiaries done by month 5; procurement & delivery of seeds/seedlings finalised by month 5; actual plantation started by month 6	8000 rural landless, and poor households, especially women & female-headed households have resumed their livelihood activities; a large number of community members along public infrastructure in 13 districts have planted trees and pulses & have resumed their livelihood activities	300 km of embankment, 1000 km of roads/highways, 2000 km of feeder roads, & 78 km of foreshore areas have been planted/reafforestat ion by month 12; 8000 men & women trained in homestead nurseries established by month 12; 4000 female trainees planted nursery packages delivered by the project, by month 12	Findings of technical needs assessment; list of beneficiaries/train ees established by project staff & staff of Forest Department; results of training programme and lists of trainees who have completed the training & received inputs; regular monitoring reports from Forest Department & project staff on social forestry & homestead nursery establishment progress	Bi-weekly during the initial stage, monthly & quarterly thereafter	Monitoring project progress; avoiding diversion from project plans; Project monitoring process; internal & external evaluations

ANNEX 9

MARKET SURVEY ANALYSIS

The mission surveyed markets in six districts, namely:

1. Barisal
2. Bhola
3. Putuakhali
4. Burguna
5. Pirojpur
6. Bagerhat

Markets were surveyed at district and Upazila levels mostly, with some selected markets at union level. The survey concentrated on 12 basic commodities, including vegetable seeds and fertilizer (ref. Table 1).

The mission findings are as follow:

- Prices for all basic commodities were very similar in all districts, with a small margin of 1-2 TK between district and Upazila;
- Access to markets had been affected for 3-4 days due to road blocks by falling trees and some feeder roads were washed away; at the time of the mission all district and Upazila markets were accessible;
- There are small shops in the villages providing basic items, such as sugar, soap, salt, however, most people go to larger markets at Upazila and sometimes Union level regularly for bulk supplies; companies for packed supplies, such as cooking oil, sugar, soap, salt, etc. deliver supplies directly to small shops at village and union levels;
- Delivery of supplies in most affected areas was disrupted for 3-4 days, caused by lack of access to ferries and boats, as well as by blocked roads; but re-established very quickly and at the time of visit markets were fully functioning;
- Prices did not change much after the cyclone, only two districts reported slight rise of 2-3 TK per unit; only oil and sugar were increased by 5-10% respectively due to breakdown in supply chain, especially because these are imported;
- Unlike many other places, where aid agencies and governments purchase huge amount of supplies for relief, the market in all affected districts responded very positively; in most cases dealers reported specially reduced prices for basic commodities used for relief of 5-10% where in other cases dealers have offered free transport and/or packaging of supplies;
- Margin between wholesale and retail is very small, often in the range of 3-4 TK per unit.

Table 1: Market Survey by Commodity

Item	Unit	Price per unit - wholesale (Taka)		Price per unit – retail (Taka)	
		District	Upazilla	District	Upazilla
Rice, local varieties **- Doodkolm** **- Minikid**	kg	- 24 - 28	- 25-26 - 29-30	- 26 - 32	-28 - 33-34
Sugar	kg	29	30	29	30
Salt, depending on quality	kg	10-14	11-15	12-16	13-17
Lux body soap	Large (120 gr)	17	18	17	18
Clothes washing soap	100 gr.	11	12	11	12
Cooking Oil, imported	litre	88	88	90	90
Ghee	kg	400-600	400-600	400-600	400-600
Onions	kg	24	26	25	27
Lentils	kg	80-85	82-87	820-85	82-87
Matches	box	9	10	9	10
Vegetable seeds	100 gr	See list below			
Fertilizer *(see new government regulations below)*					

Vegetable Seed Retail Prices

- Spinach 100 gr. 30 Tk
- Reddish 100 gr. 30 Tk
- Pumpkin 100 gr. 50 Tk
- Long bean 100 gr. 30 Tk
- Tomato 100 gr. 60 Tk
- Water melon 100 gr. 200 Tk

In every market visited, there was a significant amount of vegetable and fruit tree seedlings, in addition to decorative plants, mostly from private, small-scale nurseries and farms.

Fertilizers

Following years of fertilizer crisis in Bangladesh, the Emergency Government of Bangladesh, in 2007, introduced a new mechanism. District Deputy Commissioners have been authorized to name 6-10 dealers per district, depending on the size and requirements of the district; and Upazila Executive Officers (UNO) have been authorized to name a similar number of dealers at Union level. Each dealer is allotted a certain amount of fertilizer for which they will make advance payment to the Bangladesh Chemical Industries Corporation (BCIC). Fertilisers will be delivered to dealers by the BCIC directly. Wholesale prices are fixed per bag, while retail dealers at Union level are allowed to cover transport costs and some margin.

The following are prices for Urea and Phosphate:

1. Urea: Wholesale 300 Tk
   Retail 350 Tk

2. Phosphate: Wholesale 770 Tk
   Retail 820 Tk

ANNEX 10

ANALYSIS OF ORGANISATIONS

A. GOVERNMENT ORGANISATIONS

Previously, the government consisted of 30 ministries. In March 2007, following a series of government crisis, the caretaker government introduced an emergency cabinet that is made up of seven Divisions, each headed by an Advisor, or Caretaker Minister. A Chief Advisor or Caretaker Prime Minister heads the cabinet.

Fisheries, livestock, agriculture, forestry and environment are under one Advisor, in one Division. A Director General at the national level, Deputy Director/Additional Director at regional level, and Deputy/Assistant Director at District level heads each sector. At Upazila level, Sectoral Officers are in charge of the different sectors. The lowest administrative offices are found at Upazila level.

The department of agriculture has field offices at Block levels, each with small-scale activities, headed by Sub Assistant Agriculture Officer (SAAO). Blocks, usually, consist of 1 000-1 200 families, however due to shortage of staff individual SAAOs handle blocks of up to 10 000 families in some area, depending on density of population and geographic locations.

The SAAOs have established one extension/demonstration plot at each block, using private land of individual farmers to introduce new seed varieties and technologies and provide technical assistance and advice to farmers.

Perhaps the most efficient structure at the community level is the Social Forestry Nursery and Training Centre (SFNTC), based at Upazila level, working with communities directly. The social forestry programme targets poor and landless community members in the plantation and development of forestry along highways, feeder roads, embankments and dams. The programme selects a group of community members, for instance 10 per unit and assigns them to a certain proportion of a given road, for instance 10 km. Prior to the implementation; five members are selected and trained in forest management and development. The group then selects three members, among the five, as Chairperson/President, Secretary and Treasurer, who will be responsible for the overall management and will liase with the forestry department representatives in the area.

Group members are informed right from the beginning that the stretch of well-be planted trees belong to them, though in the initial stage they are paid daily wages for preparation, plantation and other related activities. Once the process is complete, members are entirely responsible to maintain the trees, while the designated official monitors and evaluates the process and provides technical support.

When trees are ready to be harvested, they are auctioned and new seedlings are planted. The income is divided among all stakeholders. Group members receive 55% of the income, 10% will be kept for re-plantation, purchasing seedlings for instance. The other 35% are divided among forestry department, highway and road authorities and any other departments that might be involved.

In addition to trees, members are also encouraged to plant different types of legumes at different levels of the embankment, the benefit of which goes entirely to the beneficiaries.

Government-Promoted Community Organisations

With the lowest administrative level at Upazila level, Union Councils, introduced already during the British time, in undivided India, is supposed to represent the communities vis-a-vis government institutions. Depending on the density of population and geographic location, 2-4 villages are considered a Ward. Each Ward elects one representative and three or more Wards establish a Council at the Union level. A council made up of three Wards with three villages in each Ward, will have nine members. In addition, three female representatives must also be included in the council, regardless of how many female members might already have been elected as members. The villagers elect a Chairperson for each Council and the government provides a Secretary. While secretaries are educated and have some qualification, there are no criteria for the election of Chairs and members, perhaps one of the reasons why these councils have not yet been able to effectively respond to the needs of their constituencies.

Union Development Assistance Fund: Central government allots annual budget to each Union through Upazila Executive Officer. Unions propose development projects to Upazila authorities and if approved receive funding for direct implementation. These funds are in addition to sectoral development budgets. Projects may include feeder roads, bridges, or anything related to social and economic development.

Development Revenue: Union Councils also collect development tax among their respective constituencies, which again can be utilized on development projects, approved by the Upazila Executive Officer.

Discussions with communities indicate most Unions are ineffective and inefficient, though a few communities confirmed their chairs and members did bring in some relief to the villagers just after the cyclone.

B. NON-GOVERNMENTAL ORGANISATIONS (NGOS)

Bangladesh is home to perhaps the largest family of local, national and international NGOs. While some are specialized in relief and emergency operations, most have the mandate for sustainable development. There are dozens of local NGOs in each district. For instance, there are 120 local NGOs in Bhola District alone.

Among the international NGOs, OXFAM, Save the Children, CARE, COAST, Caritas and Muslim Aid UK, have been observed as the most active ones in the provision of relief and looking into mid-term and long-term livelihoods, shelter, water and sanitation and health programmes.

Bangladesh Rural Advancement Committee (BRAC), Grameen Bank, Proshika, and Association for Social Advancement (ASA) are among the largest national NGOs with nation-wide coverage, involved in a series of relief and development programmes. One of the common activities of national NGOs is saving and credit at village level. Most of the credit is provided to most vulnerable groups, especially women, for a variety of activities, such as goat raising, fish ponds and small boats, poultry, Rigshaws, shops and kiosks. Loan is given only when target beneficiaries have formed groups that can assure the repayment of loans. Groups meet weekly, accompanied by a loan officer from the agency for the collection of loans and processing requests for new loans. The loan officers are also supposed to monitor the activities of group members and provide managerial and technical support. In most cases, beneficiaries are also trained in management and development of their newly established small enterprises, as well as in technical areas.

While most village members praised these NGOs and access to loans, the competition among them is the biggest handicap and could impact their long-term intervention among the communities. In general, there are 3-5 NGOs present in each village, all doing the same thing, such as providing loans. Each agency forms its own group and as a

result there might be several groups in each village without much coordination and cooperation among them. Some villagers also take loans from different agencies, sometimes to repay the loan of another agency. However, the general impression is that most villagers do make appropriate use of loans, investing where they intended to.

Strengths and Weaknesses of NGOs

Strengths	**Weaknesses**
• Extensive human and financial resources. • Access to almost every single village. • Highly motivated staff at each level, national to village level. • Well-known and trusted by the communities. • Some degree of accountability. • Established monitoring and evaluation systems. • Deliver services and goods at village level. • Some even implement large-scale government projects.	• Most operate like businesses and some are profit-oriented, even if their Charta states them as non-profit organisations. • High interest rate for loans, 12.5%. • Negative competition, "capture beneficiaries", even at village level • Competing for resources at national and international levels. • Operating sometimes against their stated missions, especially when providing loans, e.g. dividing communities in small groups instead of uniting them. • Lack of effective coordination or cooperation among themselves in the field.

ANNEX 11

DISASTER MANAGEMENT AND RISK REDUCTION STRATEGY

A. BACKGROUND

Disaster Management covers a broad range of interventions undertaken before, during and after a disaster to prevent or minimise loss of life and property; minimise human suffering; and hasten recovery. The way national governments and their development partners respond to disaster events or situations have been based on how underlying causes have been understood.

In the past, disasters were looked at as being caused by the hazard event itself and their response was geared towards the events as they happened. As disaster events become more frequent and the magnitude of resulting losses escalates, it becomes clear that effective strategies to manage negative impacts of disaster needs to look beyond the hazard itself, alternative approaches are, therefore, required to look at what makes people susceptible to hazard events. For instance, as climate change continues to affect countries like Bangladesh, communities along riverbanks and coastal areas become more vulnerable to tidal floods, cyclones and similar events, making these communities more vulnerable to disasters. Lack of an appropriate national early warning system; lack of information at local/regional level on the intensity of rains and winds, due to poor information and communication systems; poor community organisations for search and rescue operations, are some of the main reasons for increased losses of lives, properties and livelihoods.

Like many other countries in the region, who will continue to be affected by increasing climate changes, Bangladesh will require a specific disaster management and risk reduction system that can effectively respond to the growing climate hazard in the region. Future disaster management systems will have to go beyond traditional approaches to disasters and hazards, that is going beyond relief, rehabilitation, reconstruction and building appropriate mitigation and preparedness elements into disaster management to reduce and minimise future shocks and prevent or minimise loss of lives, properties and livelihoods. One major element of effective mitigation and preparedness phase would include development and establishment of effective and efficient early warning system; one that can reach affected communities well in time before the disaster hits.

An essential shortcoming in disaster response by many national governments and aid agencies is the lack of inter-linkages between relief (immediately after the disaster) and recovery, rehabilitation and reconstruction phases with development phase. Though many agencies agree to the approach that linking relief to development is a must, in order to ensure communities acquire necessary skills, knowledge and have access to essential information and the basic requirements to prevent themselves from disasters, many are unable to follow their own policies and strategies as most funding is tightly geared to emergency relief. As a result, in most disaster situations, hazards and disasters exceed community capacity it properly and thus its vulnerability is increased.

B. GOVERNMENT OF BANGLADESH, FAO/UNDP LIVELIHOOD ADAPTATION TO CLIMATE CHANGE PROJECT (LACC 2)

In 2006, the Government of Bangladesh, in cooperation with FAO and UNDP started a new project on disaster risk management and reduction, the "Improved Adaptive Capacity to Climate Change for Sustainable Food and Livelihoods Security in Drought Prone and Coastal Regions of Bangladesh". The project follows a similar intervention by

FAO since 2004, the "Livelihood Adaptation to Climate Change" (LACC) that concentrated primarily on drought-prone regions of Northern Bangladesh.[1]

Building on lessons learned from LACC1, the agencies identify a number of key issues for both the drought-prone areas of the North and cyclone/flood prone coastal regions of the South and Southwest and propose a number of interventions to address those issues in a sustainable manner. For the purpose of this document, the following chapters will concentrate on the coastal regions, its key issues and will forward some of the major interventions LACC2 has proposed in 2006, instead of reinventing the wheel and writing a complete new chapter.

Key Issues in the Coastal Regions[2]

The major constraints and challenges for future action identified through the field missions and stakeholder meetings in coastal areas are:

- Cyclones, coastal flooding and salinity adversely affect agriculture, livestock and fishery sectors in all seasons.
- Transplanted *Aman rice*, the major food crop, suffers from high yield reduction due to coastal flooding, saline water intrusion and water stagnation in the coastal areas.
- The economy in coastal areas is particularly vulnerable to climate change impacts: About 85% of the population in coastal areas depends on agriculture, as against the national average of 63%.
- Early tidal waves in Kharif I and high tidal waves in Kharif II, effects agriculture production.
- Excess rainfall causes flood during August – September/October.
- Cyclonic storms during October – November affects the standing field and plantation crops.
- Breaching of embankments creates water stagnation due to poor drainage facilities leading to salinisation.
- On average 25% of the total land area is affected by salinity in Borguna, Pirojpur and Patuakali districts which accounts for over 100,000 hectares of land area.
- Rabi (boro) and Kharif I crops are mainly affected by salinity which causes about 20% yield reduction.
- Over flow of water during monsoon season affects fish culture in small farms.
- Non-availability of green fodder and frequent cyclonic storms affects the livestock sector.

Though a number of projects have already been completed and several are currently underway in the two regions, the projects are not explicitly designed to address vulnerability of rural livelihoods to climate variability and change in coastal regions. However, the project suggests that the lessons learnt would encourage implementing a livelihood approach for adapting to climate change and reducing climate risks. In this context, it is suggested to apply the community centred "livelihood adaptation to climate change (LACC)" approach to southern-central coastal regions of Bangladesh.

[1] Improved Adaptive Capacity to Climate Change for Sustainable Food and Livelihoods Security in Drought Prone and Coastal Regions of Bangladesh (LACC 2), Government of Bangladesh, United Nations Development Programme, and Food and Agriculture Organisation of United Nations, proposal June 2006.

[2] LACC2, et al.

UNDP's Adaptation Policy Framework (APF)

The LACC2 project proposes to adopt the United Nations Development Programme's Adaptation Policy Framework (UNDP APF, February 2004) recommendations for grounding and pilot testing livelihood adaptation options. The Adaptation Policy Framework is structured around four major principles that provide a basis from which actions to adapt to climate change can be developed:[3]

"Adaptation to short-term climate variability and extreme events serves as a basis for reducing vulnerability to longer-term climate change;
Adaptation policy and measures are assessed in a developmental context;
Adaptation occurs at different levels in society, including the local level; and
The adaptation strategy and the process by which it is implemented are equally important."

The major steps recognized under the APF are:

- Assessing future climate risks
- Assessing current vulnerability
- Formulating an adaptation strategy
- Scoping and designing adaptation project
- Continuing the adaptation process

B. FAO/UNDP LIVELIHOOD ADAPTATION TO CLIMATE CHANGE (LACC2)[4]

Overall Objective

The overall objective of the project is to introduce, improve or further strengthen disaster risk reduction and climate change adaptation capacities for sustainable livelihood and food security in the rural sectors including livestock, fisheries and forestry and other key factors for rural livelihoods in drought prone and coastal regions of Bangladesh.

Immediate objectives

Objective 1: To strengthen institutional and technical capacities at all relevant levels for disaster risk reduction and livelihood adaptation to climate change in agriculture, livestock, fisheries and forestry, addressing climate information needs, knowledge gaps and key skills and competencies required.
Objective 2: To implement in a participatory way, jointly with local communities, effective climate change adaptation and disaster preparedness practices, and strategies for their long-term sustainability.

The approach is designed to assess and enhance the adaptive capacity by engaging stakeholders. The UNDP APF strategy (2004) also advocates that any successful intervention in the area of disaster risk prevention and/or preparedness is an input to increase long-term capacities for climate change risk management. Therefore, the implementation process will be initiated from a disaster risk management perspective, and emphasize on climate change issues. The existing coastal zone management efforts to combat coastal flooding, tidal waves etc. will be a reference to initiate the pilot activities.

The climate change scenarios developed through Global Circulation Models will be presented in the form of future impact scenarios. Based on projections of future climate change impacts and considering current impacts due to climatic variability, the long-term

[3] LACC2, et al.
[4] LACC2, et al.

climate forecast and climate analogue information will be presented in probabilistic terms to take well-informed pro-active management decisions and devise respective strategies. The provision of probabilistic climate information days and months in advance, relevant to farmers' needs, calls for evolving innovative translation and communication methodologies and processes, as well as the establishment of effective institutional mechanisms. These methodologies and processes will instil a culture of utilizing climate information presented in probabilistic terms for decision-making purposes in a risk management framework. This will pave the way for the easy assimilation of probabilistic climate change modelling results for decision-making purposes by farmers, agriculture sector support agencies like the Department of Agriculture Extension, and policy planners.

The LACC project seems to be benefiting from extensive experiences, both from LACC1 and other agencies' small-scale projects and interventions and suggests wide-ranging interventions to address key issues. It is, therefore, strongly recommended that this project be supported, both by present FAO programme and other sources that would ensure the development and establishment of appropriate approaches to risk reduction and disaster management. Developing practical tools, approaches and mechanisms to disaster management and risk reduction is key to strengthening local and national capacities to address issues affecting food security and securing livelihoods of the rural communities in the coastal regions. Experiences of the recent years, especially those of 2007 (two severe floods in August and September and a devastating cyclone in November) confirm the basic findings of the LACC project and unless the situation is addressed in a sustainable manner, the future perspective of millions of rural population in the coastal areas looks rather grim. Disaster management and risk reduction is beyond any government's capacity and is doomed to failure, unless communities are also well prepared and equipped the capacity to deal with disaster preparedness and risk reduction. Developing appropriate approaches to disaster management and risk reduction must consider a two-track approach, as mentioned earlier in this chapter: Track one would be developing national capacities and improving existing standards and facilities for early warning system and disaster management; and track two would be developing community skills and capacities for effective disaster preparedness and mitigation.