

BANGLADESH: NAPA PROJECT PROFILE

1. Reduction of climate change hazards through coastal afforestation with community participation.	Page 2
2. Providing drinking water to coastal communities to combat enhanced salinity due to sea level rise.	Page 4
3. Capacity building for integrating Climate Change in planning, designing of infrastructure, conflict management and land-water zoning for water management institutions.	Page 6
4. Climate change and adaptation information dissemination to vulnerable community for emergency preparedness measures and awareness raising on enhanced climatic disasters.	Page 9
5. Construction of flood shelter, and information and assistance centre to cope with enhanced recurrent floods in major floodplains.	Page 11
6. Mainstreaming adaptation to climate change into policies and programmes in different sectors (focusing on disaster management, water, agriculture, health and industry).	Page 13
7. Inclusion of climate change issues in curriculum at secondary and tertiary educational institution.	Page 14
8. Enhancing resilience of urban infrastructure and industries to impacts of climate change	Page 16
9. Development of eco-specific adaptive knowledge (including indigenous knowledge) on adaptation to climate variability to enhance adaptive capacity for future climate change.	Page 18
10. Promotion of research on drought, flood and saline tolerant varieties of crops to facilitate adaptation in future.	Page 20
11. Promoting adaptation to coastal crop agriculture to combat increased salinity.	Page 21
12. Adaptation to agriculture systems in areas prone to enhanced flash flooding– North East and Central Region.	Page 23
13. Adaptation to fisheries in areas prone to enhanced flooding in North East and Central Region through adaptive and diversified fish culture practices.	Page 26
14. Promoting adaptation to coastal fisheries through culture of salt tolerant fish special in coastal areas of Bangladesh	Page 28
15. Exploring options for insurance to cope with enhanced climatic disasters.	Page 31

BANGLADESH

NAPA PRIORITY PROJECT NO. 1

REDUCTION OF CLIMATE CHANGE HAZARDS THROUGH COASTAL AFFORESTATION WITH COMMUNITY PARTICIPATION

TYPE OF PROJECT

Intervention (with awareness raising and policy elements)

RATIONALE

The location of Bangladesh has made it prone to natural calamities like flood, drought, storms, cyclones and tidal surges. Frequency and occurrence of storm surges is projected to increase as a consequence of climate change in the coastal areas of Bangladesh. The presence of forest plays a vital role in stabilizing shorelines and providing protection against cyclones and other extreme events. The coastal areas of Bangladesh especially the Meghna estuary are exposed to cyclone and tidal surges. A thick forest belt is required to act as a buffer zone in order to provide protection to these vulnerable coastal areas. In the NAPA regional workshop held in Khulna, the threats arising from decreasing mangrove forest cover and the impacts of salinity intrusion in coastal areas were discussed. Recent experiences with tsunami have strengthened the theoretical basis that mangrove forests reduce the vulnerability from natural disasters. The participants recalled the past initiatives for the creation of greenbelts in the Forest Management Plan (FMP) and the Coastal Greenbelt Project and highlighted the need for widening of the forest belt. A community based afforestation program with deep-rooted, salt-tolerant species was suggested. The involvement of the local people, especially the women, will enhance their adaptive capacities and livelihoods in general. The project is set to provide synergy with the National Biodiversity Strategy and Action Plan, where afforestation is one of the critical working components.

DESCRIPTION

Objectives and activities

- Strengthen the adaptive capability further, so as to face the more vulnerable situation that arises out of climate change scenario;
- Creation of a shelterbelt along the coastal zone;
- Generation of Employment Opportunities;
- Enhanced Carbon sink under the global context.

Inputs and Activities

- Identify Community Based Organizations (CBO) and other participants for the implementation of social forestry programs in the coastal zones of Bangladesh;
- Capacity building of the participants through training on i) Nursery ii) Afforestation iii) Care and Maintenance;
- Capacity building of the stakeholders through various awareness tools;
- Afforestation i) Nursery ii) Planting iii) Maintenance;
- Monitoring and reporting;
- Trained manpower for community mobilization;
- Experts and experienced manpower to provide technical training on i) Nursery and, ii) Afforestation;
- Capable, experienced and expert forestry professionals to supervise on the job activities such as i) Nursery ii) Afforestation iii) Maintenance;

- Adequate fund to undertake activities envisaged.

Short-term outputs

- Generation of Employment Opportunities;
- Development of local skills;
- Enhance the income of poor while participating in the program;
- Awareness generation.

Potential long-term outcomes

- Enhancement of a vegetative cover along the coast of Bangladesh;
- Creation of vegetative cover under a 'shelterbelt' concept;
- Enhanced capability to combat the impact of cyclone and tidal surges;
- Reduction in the magnitude of devastation arising out of cyclone and tidal surges;
- Add to the global Carbon sequestration aspect;
- Manpower development;
- Creation of job opportunities Implementation.

IMPLEMENTATION

Institutional arrangement

Primary implementing agency: Forest Department

Secondary implementing agencies: NGOs and CBOs

Risks and barriers

- Administrative complexities in getting suitable land to undertake afforestation;
- Flow of funds for the project activities.

Evaluation and monitoring:

Participatory monitoring under the leadership of IUCNB shall be the evaluation and monitoring tool for the project

Financial resources:

An indicative and tentative financial resource estimate for the activities provided below:

COST

<i>USD 23 million</i>

BANGLADESH

NAPA PRIORITY PROJECT NO. 2

PROVIDING DRINKING WATER TO COASTAL COMMUNITIES TO COMBAT ENHANCED SALINITY DUE TO SEA LEVEL RISE

TYPE OF PROJECT

Intervention (with awareness raising and policy elements)

RATIONALE

Ground and surface water in coastal areas is affected by salinity intrusion through rivers and aquifers. With the current increase in climate change and sea level rise, people in the coastal areas will severely suffer from scarcity of safe drinking water. Given this situation, finding alternative sources (e.g. rainwater harvesting, surface and ground water treatment) of safe drinking water is essential for the safety of present and future generations. Therefore, a comprehensive strategy should be developed for access to safe drinking water from alternative sources.

DESCRIPTION

Objectives and activities:

Development of a comprehensive strategy for safe drinking water supply in coastal areas

Inputs and Activities:

- Multi-disciplinary expertise;
- Water resource development expert for identifying alternative drinking water sources;
- IWRM expert for assessing options for integrated water resource development;
- Public health expert for incorporating health issues with drinking water sources development strategy;
- Identification of existing drinking water sources;
- Review of existing technical capabilities to utilize safe drinking water sources;
- Understanding community interest to alternative sources;
- Review of national plans and policies;
- Develop short and long term strategy for alternative source of safe drinking water;
- Development of alternative source of safe drinking water.

Short-term outputs:

- In-depth potable water resource availability and alternative options;
- Safe drinking water sources for present use.

Potential long-term outcomes:

- Improved management system for safe drinking water supply;
- Improved preparedness programme for drinking water supply in crisis situation.

IMPLEMENTATION

Institutional arrangement

Primary implementing Agency: DPHE

Secondary implementing Agencies: LGED, BWDB, NIPSOM, NGOs and Local Community

Risks and barriers

Lack of comprehensive knowledge base for developing strategy

Evaluation and monitoring

A committee formed by MoLGRD and Ministry of Health and Family Welfare

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full project: USD 1,500,000

Project design: USD 25,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 3

CAPACITY BUILDING FOR INTEGRATING CLIMATE CHANGE IN PLANNING, DESIGNING OF INFRASTRUCTURE, CONFLICT MANAGEMENT AND LAND-WATER ZONING FOR WATER MANAGEMENT INSTITUTIONS

TYPE OF PROJECT

Capacity building (with some policy and research elements)

RATIONALE

The community of climate change scientists and their numerous publications at the international domain have identified the Bengal coast as highly vulnerable to climate change induced water resources adversities (e.g. sea level rise, water logging, and floods). The National Water Management Plan (2001) has also formally identified a gap in knowledge related to this issue and has asked for this gap to be filled for future adaptation. NWMP's demand-supply approach primarily considered the current water resources availability and constraints issues. It left out the sustainability issues that consider climate change related factors in the planning of water resources. From past experience, it can be observed that climate change issues are not adequately considered while designing water resources structures. Lack of proper assessment of climate change in designing and implementing structures make structural interventions more prone to climatic hazards. Consideration of climate change issues and adaptive measures needs to be a regular part of the activities of water sector managers. Engineers and water sector managers can contribute to the sustainable management of water resources if their knowledge can be more contextualized with climate change science and adaptation options. At the same time, institutional and policy development is also essential for facilitating water sector managers in designing multi-objective projects involving all stakeholders. Water resources management in Bangladesh is a multi-stakeholder issue. Different stakeholders and interest groups have their own diverse interests in the management of water and land resources in Bangladesh. This often creates situations of conflict. Moreover, with the increased climatic extremities the areas of conflict between various interest groups (i.e., fishermen and farmers) are expected to aggravate further. Drainage, which is an essential facility for farmers, is often hampered by the activities of fishers. In this situation, the stakeholders need to build their adaptive capacities in multiple ways. One major way would be to build capacity for negotiating sustainable conflict management, particularly in the water sector. Furthermore, the increasing climatic physical changes such as increased sedimentation in tidal rivers etc. also call for measures for sustainable adaptive measures. Considering the above context, land and water zonation is also necessary that considers the interests of stakeholders for the sustainable development of the coastal area. Zonation of land and water will facilitate sustainable management of agriculture, fisheries, mangrove forests, navigation, drainage, flood control, wetland restoration as well as human settlements and livelihood activities.

DESCRIPTION

Objectives and activities

- Incorporation of climate change issues and concerns in water sector policies and plans;
- Capability development and networking of water resources sector planners and professionals to address climate change hazards;
- Develop mechanisms and tools for both analytical purposes, e.g. Integrated Water Resource Management (IWRM), Water Balance Models and negotiation, e.g. Guidelines for Participatory Water Management (GPWM), as well as for consideration of more people friendly traditional drainage systems, e.g., Tidal Basin Management (TBM). The development of such tools for negotiation would benefit agriculture, human settlements, forest and fisheries as well as natural and man-made drainage structures;

- Delineation of land and water zones considering sustainable use of resources in respect to climate change;
- Development of design manuals and identification of vulnerable structures for designing structural adaptation.

Activities

- Filling Climate Change Knowledge Gap for Water Resources Planning;
- Formulation of Land and Water Zonation for Climate Change Adaptation in Bangladesh;
- Development of Conflict Management Instruments/Tools for Sustainable Drainage Systems;
- Development of Capacity Building Tools for Designing Structural Adaptation.

Inputs

- Experts and experienced manpower to provide technical training for planning and design for incorporating CC for water sector and other sectors;
- Design experts for developing the manuals and identification of climate change issues;
- IWRM expert and TBM expert for determining integrated water resource management options;
- Adequate and timely funding for smooth implementation;
- Anthropologist, Conflict Management Experts and so forth;
- Data sets related to climate change and water resources planning;
- Land and water use data sets.

Short-term outputs:

- Trained water sector planner and designer;
- Greater understanding for better planning in the water resources sector considering climate change related issues and probable consequences;
- Trained professionals;
- Design manuals;
- Identified vulnerable structures;
- Local and national level conflicting issues identified and tools and mechanisms to resolve drainage and water resources related conflicts available;
- Resolution mechanism to resolve conflicts and trade-off between local and national interest;
- Land and water zone for human and environment.

Potential long-term outcomes:

- Climate Change related database and planning tools;
- Knowledge development sustainable water resource planning that will consider climate change issues;
- More proactive action towards sustainable resource utilization;
- Practice of more sustainable adaptation measures;
- Better equipped knowledge for adaptation in long term issues on Climate Change;
- Practice of sustainable utilization of land and water considering interest of all stakeholders;

IMPLEMENTATION

Institutional arrangement

Primary implementing Agency : WARPO Secondary implementing Agencies: DoE (Climate Cell) CEGIS, IWM and Universities and research organizations, BWDB, LGED, RHD, MoL, MoWR, MoEF, DAE, DoF, FD, DoLS, CEGIS, CBOs

Risks and barriers

- WARPO is not sufficiently strengthened as per agencies process;
- Lack of cooperation among different agencies in knowledge gap filling;
- Inadequate fund for structural adaptations;
- Lack of trade-off attitude between influential stakeholders;
- Proper implementation of zoning.

Evaluation and monitoring

A committee formed jointly by MoEF, MoWR, MoLG & RD, MoC and MoFDM for evaluation and monitoring.

COST

An indicative and tentative financial resource estimate for the activities provided below:

<i>USD 5,000,000</i> <i>Project design: USD 50,000</i>
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BANGLADESH

NAPA PRIORITY PROJECT NO. 4

CLIMATE CHANGE AND ADAPTATION INFORMATION DISSEMINATION TO VULNERABLE COMMUNITY FOR EMERGENCY PREPAREDNESS MEASURES AND AWARENESS RAISING ON ENHANCED CLIMATIC DISASTER

TYPE OF PROJECT

Awareness raising (with capacity building elements)

RATIONALE

Increase in temperature and change in precipitation and sea level, as well as the possible increase in frequency and intensity of severe climate events will affect human health both directly (e.g. death due to heat stress) and indirectly (e.g. famine resulting from changes in rainfall). Most of these impacts will be negative, i.e. any health benefits from less severe winters for example, will be offset by the rapid changes to the environment to which human biology and culture have become accustomed. This could include changes in the distribution of diseases, impacts on agriculture or changes to conditions in coastal areas, which have large populations, especially in the developing world. Therefore, more awareness about diseases due to climate change and changes in human behaviour will be a feasible solution to protect human health. This will be particularly true for developing countries like Bangladesh that has low technical capability to fight against outbreaks of easily communicable diseases.

DESCRIPTION:

Objectives and activities

- Protect people from climate change related health problems through awareness programmes;
- Development of guidelines for awareness and behavioural change programmes.

Inputs and Activities:

- Environmental Health Experts for identifying climate change related diseases and possible remedial measures;
- Community mobilization expert to develop guidelines of awareness and behavioural change programmes.

Short-term outputs:

- Existing and possible future disease identification;
- Identification of remedial measures;
- Guidelines for adaptation of human health to the impact of climate change.

Potential long-term outcomes

- Improvement of human health treatment facilities;
- Improved preparedness programme for severe communicable diseases.

IMPLEMENTATION:

Institutional arrangement:

Primary implementing agency : Ministry of Environment and Forest.

Secondary implementing agencies : Directorate of Health, ICDDR, NGOs.

Risks and barriers:

- Respective organizations may not have enough technical capability to identify diseases
- Community may not respond to make change in ethnic / present behaviour

Evaluation and monitoring:

- A committee formed by the MoH and FW

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full project: USD 7,000,000

Project design: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 5

CONSTRUCTION OF FLOOD SHELTER, AND INFORMATION AND ASSISTANCE CENTRE TO COPE WITH ENHANCED RECURRENT FLOODS IN MAJOR FLOODPLAINS

TYPE OF PROJECT

Intervention (with policy and awareness raising elements)

ACTIVITIES

Construction of Multipurpose Cyclone – Flood Shelters in High Vulnerable Areas

RATIONALE

Coastal areas are vulnerable to cyclones and storm surges. Heavy wind and sea water destroy houses and properties. Lives are lost in remote coastal areas due to the absence of shelters. To protect people and livestock from cyclones and cyclone induced floods, suitable shelters are required for people and their livestock. The rest of the time when there are no natural disasters, these shelters can be used as schools, community centers, or for other purposes.

With the projected Sea Level Rise, the height of the shelters may prove to be inadequate. The shelters may need to be redesigned and strengthened in order to incorporate climate change considerations.

DESCRIPTION

Objectives and activities

- Increase the height and strengthening proposed shelters from climate change induced hazards

Inputs

- Reviewing existing condition of cyclone shelters;
- Improvement of design criteria in context of climate change;
- Adoption of new criteria in construction of new shelters;
- Experts of Disaster Management;
- Engineers for designing shelters.

Short-term outputs

- Shelters for vulnerable people in cyclone prone remote coastal area.

Potential long-term outcomes

- Safety of life from climate change induced cyclone and flood;
- Improvement of disaster management system.

IMPLEMENTATION

Institutional arrangement

Primary implementing Agency: DMB, LGED

Secondary implementing Agencies: BMD, BWDB

Risks and barriers

- Non-availability of fund;
- Proper utilization of shelters;
- Proper construction of shelters.

Evaluation and monitoring

- A committee formed by MoFDM.

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full project: USD 5,000,000

Project design: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 6

MAINSTREAMING ADAPTATION TO CLIMATE CHANGE INTO POLICIES AND PROGRAMMES IN DIFFERENT SECTORS (FOCUSING ON DISASTER MANAGEMENT, WATER, AGRICULTURE, HEALTH AND INDUSTRY)

TYPE OF PROJECT

Capacity building (with awareness raising, policy and research elements).

RATIONALE

Many of the key sectors (such as disaster management, water, agriculture, health and industry) are vulnerable to climate change impacts and need to include such potential impacts in their sectoral design and investments.

DESCRIPTION

Objectives and activities

To mainstream climate change impact assessment (and adaptation) into sectoral planning and policy in the disaster management, water, agriculture, health and industry sectors .

Inputs and Activities

- Climate change and sectoral experts to advise sectoral;
- Planners and policy makers on the ways of incorporating and mainstreaming climate change impacts into sectoral plans and policies.

Short-term outputs

Greater awareness of climate change issues and their importance in sectoral planning and policies.

Potential long-term outcomes

Mainstreaming of climate change impacts (and adaptation) into sectoral plans and policies.

IMPLEMENTATION

Institutional arrangement

Primary implementing agency: DOE

Secondary implementing agencies: WARPO, FD, DOF, BARC, Universities,

Risks and barriers

Lack of understanding and awareness of the climate change issues within the sectoral agencies.

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full project: USD 1 million

Design phase: USD 25,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 7.

INCLUSION OF CLIMATE CHANGE ISSUES IN CURRICULUM AT SECONDARY AND TERTIARY EDUCATIONAL INSTITUTIONS.

TYPE OF PROJECT

Awareness raising (with policy elements)

RATIONALE

Climate change will affect large parts of the country over very long periods of time (several decades). Therefore it is imperative that the younger and future generations are made aware of the problem (and solutions) of the climate change impacts by getting such knowledge incorporated into school curriculum at both secondary as well as primary levels.

DESCRIPTION

Objectives and activities

- To incorporate climate change impacts and adaptation into school curriculum at secondary and primary levels

Inputs and Activities

- Develop an appropriate curriculum on climate change impacts and adaptation for primary school students;
- Develop an appropriate curriculum on climate change for secondary school students;
- Incorporate the courses on climate change into the school curriculum.

Short-term outputs

- Climate change course curriculum for primary school students;
- Climate change course curriculum for secondary school students.

Potential long-term outcomes

- Future generations of primary and secondary school students will learn about climate change impacts and adaptation

IMPLEMENTATION

Institutional arrangement

Primary Implementing agency: Board of education

Secondary implementing agencies: Universities

Risks and barriers

The Education Board fails to allow the newly developed courses into the school curriculum

Evaluation and monitoring

A multi-stakeholder review committee will monitor the project activities and evaluate its products.

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full Project: USD 500,000
Project design: USD 25,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 8

ENHANCING RESILIENCE OF URBAN INFRASTRUCTURE AND INDUSTRIES TO IMPACTS OF CLIMATE CHANGE INCLUDING FLOODS AND CYCLONE

TYPE OF PROJECT

Capacity building (with policy and awareness raising elements)

ACTIVITIES

- Specification in National Building Code for building industry and infrastructure in potentially vulnerable areas;
- Community based safe dumping place of pollutants.

RATIONALE

Urban infrastructure in the major cities of the country will be adversely affected by climate change impacts, especially floods and cyclones. These need to be made more resilient to withstand those impacts.

DESCRIPTION

Objectives and activities

- To enhance resilience to climate change (including floods and cyclones) in urban and industrial sectors in the major cities

Inputs and Activities

- Development of better building codes for buildings;
- Development of better waste management for industries;
- Development of better warning systems.

Short-term outputs

- Greater understanding of climate change impacts and enhanced awareness and readiness in urban and industrial sectors

Potential long-term outcomes

- Enhanced resilience of urban and industrial infrastructure to the impacts of climate change.

IMPLEMENTATION

Institutional arrangement

Primary implementing agency: DOE

Secondary implementing agencies: HBDC, Min of Industries, FBCCI, DCCI,

Risks and barriers

- Lack of understanding and awareness of the climate change issues within the concerned agencies

Evaluation and monitoring

- Through a multi-sectoral multi-stakeholder review committee

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full project: USD 2,000,000

Design phase: USD 25,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 9

DEVELOPMENT OF ECO-SPECIFIC ADAPTIVE KNOWLEDGE (INCLUDING INDIGENOUS KNOWLEDGE) ON ADAPTATION TO CLIMATE VARIABILITY TO ENHANCE ADAPTIVE CAPACITY FOR FUTURE CLIMATE CHANGE.

TYPE OF PROJECT

Intervention (at community level, involves awareness raising and capacity building elements)

RATIONALE

The agro-ecological regions of the country are very diverse and will be impacted in very different ways. However, in all the ecological regions the poor (including women, elderly and children) are the most vulnerable and likely to also be most adversely impacted by climate change. Hence eco-specific actions for helping vulnerable communities (with emphasis on women, children and elderly) need to be developed and disseminated to the vulnerable communities to allow them to adapt to potential impacts of climate change.

DESCRIPTION

Objectives and activities

- To develop actions in each of the main ecological regions of the country to adapt to the eco-specific impacts of climate change in those regions;
- To disseminate the knowledge on ecospecific adaptation to the most vulnerable communities in each eco-region (with emphasis on women, children and the elderly).

Inputs and Activities

- Selection of main eco-regions (four or five);
- Selection of local partners in each region;
- Development of pilot actions and learning;
- Sharing learning;
- Disseminating action packages to vulnerable communities.

Short-term outputs

- Adaptation packages to be used by vulnerable communities in different ecoregions of the country.

Potential long-term outcomes

- Most vulnerable sections of communities in each eco-region will be able to adapt to adverse impacts of climate change

IMPLEMENTATION

Institutional arrangement

Primary implementing agency: NGO consortium.

Secondary implementing agencies: NGOs, local government.

Risks and barriers

- Failure to develop adequate adaptation packages in each eco-region.

Evaluation and monitoring

- Through a multi-sectoral and multistakeholder review committee.

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full project: USD 5 million

Design phase: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 10

PROMOTION OF RESEARCH ON DROUGHT, FLOOD AND SALINE TOLERANT VARIETIES OF CROPS TO FACILITATE ADAPTATION IN FUTURE

TYPE OF PROJECT

Research

RATIONALE

Crop agriculture is still the mainstay of the economy and rural workforce in Bangladesh and will be very vulnerable to impacts of climate change in future. Therefore, it will be imperative to develop improved varieties of all types of crops to withstand the potential impacts of climate change such as floods, droughts, high temperature, salinity, etc.

DESCRIPTION

Objectives and activities

To develop new varieties of crops such as rice, wheat etc, to tolerate saline, flood and drought conditions.

Inputs and Activities

Laboratory facilities (hardware and human resources) for plant breeding in the main crop research institutes in the country

Short-term outputs

New varieties of salt, drought and flood tolerant crops developed

Potential long-term outcomes

Flood-prone, drought-prone and salinity-prone areas of the country adopt the new varieties and reduce their vulnerability to climate change impacts.

IMPLEMENTATION

Institutional arrangement

Primary implementing agency: BARC

Secondary implementing agencies: BARI, BRRI, DAE, NGOs

Risks and barriers

- Failure to develop new varieties;
- Evaluation and monitoring;
- Through a multi-sectoral, multi-stakeholder review committee.

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full project: USD 5,000,000

Design phase: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 11

PROMOTING ADAPTATION TO COASTAL CROP AGRICULTURE TO COMBAT SALINIZATION

TYPE OF PROJECT

Intervention (with policy, awareness raising and research elements)

RATIONALE

A significant part of the coastal area is facing salinity problems due to tidal surge flooding. It is anticipated that salinization and tidal surges would be pronounced under warmer climate particularly due to sea level rise. Therefore crop agriculture needs new approaches and technologies to deal with salinization in the coastal area. No crop is cultivated during Kharif season due to high depth of standing water in the field. Water recedes late from the crop field and keeps soil muddy at the time of appropriate sowing of the next candidate crops. Traditional land preparation is not possible. Affected community needs food, fodder, fuel and feed earlier than the next rice crop (Boro rice, wheat, potato, etc). At this condition the affected communities remain half-fed, ill fed, malnourished and moves to cities or other areas for job and livelihood.

DESCRIPTION

Objectives and activities

- The main objective of the wet bed no-tillage methods maize production is to produce maize, (before next Boro rice crop) for tidal surge flood affected community after loss of Aman rice crop. It will also help to meet fuel and fodder need of the community;
- Produce selected vegetables and fruits on raised bed to meet day-to-day demands of the affected households. Some cash is also generated from sale proceed of the vegetables;
- Motivate the affected community to adapt the above technologies to combat with coastal inundation due to tidal surge after loss of crops or no crop items.

Inputs

- Maize seeds, fertilizers, are the major inputs required;
- Maize harvester/ Sheller would be required;
- Audiovisual appliances for training of the community would be required;
- For supervision of field activities transport would be required.

Short-term outputs

- Production of food, fodder, fuel, and feeds needed by he affected community before the next Boro rice and wheat crop;
- Production of fruits and vegetables;
- Meet household's demand for vegetables and fruits partially or fully meet;
- Family nutrition is improved;
- Generate cash by selling output partially Potential long-term outcomes;
- Adoption of the technology would help the community to adapt with flood/ tidal surge and sea level rise;
- Affected community would not migrate to cities for job and livelihood;
- When the Sorjan beds are made it would generate vegetables and fruit continually;
- Social consequences of mass scale migration to cities would to some extent be halted.

IMPLEMENTATION

Institutional arrangements

The technology was designed by the On-farm Research Division (OFRD) of BARI. OFRD has a network of field research sites with subprofessional posted at the field level. Professional scientists posted at the district level supervise the field activities. Department of Agricultural Extension (DAE) is mandated for extension of technology, having field workers at village level. Planning and implementation might be responsibility of extension with technical support from OFRD, BARI. Soil Resources Development Institute (SRDI) having professional posted at the district level monitor soil salinity. NGOs are working all over the country. The project might be implemented by DAE. NGOs may also be involved in the implementation of activities. As the technology is of different nature local consultants having background in farming system might be required for successful implementation of the activity. BARC may do the overall coordination of the project during implementation stage.

Primary implementing agency: BARI?

Secondary implementing agencies: DAE, SRDI, NGOs

Risks and barriers

The community should be organized to join the production system in a contiguous large block. Otherwise protection of the crop from birds and jackal would be difficult. Moreover, cobs from a single isolated plot are likely to be stolen by the children. This may also cause social problem. Other than these no risk and barriers were noticed while designing the technology.

Evaluation and monitoring

- This is not a traditional type of technology. Thus it would require constant technical supervision in the field in all stages of production to develop the intended benefit;
- An independent multidisciplinary team should be formed by BARC for monitoring and evaluation of the activities to assess performance of the technology in generating the intended benefits.

COST

- As mentioned above this is not a traditional technology. The project would require services of project staff and local consultants;
- Production cost depends on the size of field block (tentatively 5 ha blocks of 10 farmers in clusters) and their number (tentatively 1000 clusters);
- Farmers and the sub professional at the field level would require training on the concept and production/harvesting packages of the technology;
- Audiovisual aid would be needed for the training activities;
- Sufficient number of field days would be required to disseminate the technology;
- Rapid appraisal would be required to identify specific location and communities;
- Detail planning may estimate demand on the financial resources;
- Demand of financial resources would depend on size of the sorjan beds and the total number that would be replicated. Detail costing may be worked out during detail planning and implementation.

An indicative and tentative financial resource estimate for five years is provided as below:

Full Project: USD 6,500,000

Project design: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 12

ADAPTATION TO AGRICULTURE SYSTEMS IN AREAS PRONE TO ENHANCED FLASH FLOODING–NORTH EAST AND CENTRAL REGION

TYPE OF PROJECT

Intervention (with policy, awareness raising and research elements)

RATIONALE

North east and central regional of the country are prone to flood and will become more prone under anticipated future climate change. Crop field and homesteads are inundated by flood, crops and seedlings are damaged/lost, water recession is delayed, water logging is prolonged, community needs immediate and/or early harvest of vegetables before a regular vegetable crop. Therefore crop agriculture need new approaches and technologies to deal with flood. No crop is cultivated during Kharif season due to high depth of standing water in the field. Water recedes late from the crop field and delay time of appropriate sowing of the next candidate crops. Traditional land preparation is not possible. Affected community needs food, fodder, fuel and feed earlier than the next rice crop (Boro rice, wheat, potato, etc). At this condition the affected communities remain half-fed, ill fed, malnourished and moves to cities or other areas for job and livelihood.

DESCRIPTION

Objectives and activities

- The main objective of the no-tillage methods potato cultivation is to produce staple food, (before next Boro rice crop) for flood affected community after loss of Aman rice crop;
- Produce selected vegetables to meet day-today demands of the affected households. Some cash is also generated from sale proceed of the vegetables;
- Motivate the affected community to adapt the above technologies to combat with inundation due to flood after loss of crops or no crop items.

Inputs

- Potato seeds, fertilizers and mulch material are the major inputs. The mulch material like water hyacinth is available after the flood;
- Seeds and some fertilizer are needed;
- The floating substratum is made of water hyacinth, which is available during flood.

Short-term outputs

- Produce potato and cash by selling potato to meet the needs of the flood-affected community. Potato at the rate of 18-20 t/ha is obtainable from the production system;
- Produce vegetables to meet day-to-day requirement of the affected community;
- Generate continuous supply of nutrition;
- Generate cash by selling the vegetables. Potential long-term outcomes;
- This is a contingency option for the flood affected community. In the long-term people might get a means to continue with farming, instead of migrating to cities after the flood. This would to some extent reduce social problems of migration of the distressed community to cities;
- The system, as because require almost no cost, is suitable for the distressed community to adapt. Thus it is likely that the community would continue to adopt the adaptation tool;

- The production system is a potential source of nutrition from the vegetables, which the distressed community very often suffers from especially at the time of flooding.

IMPLEMENTATION

Institutional arrangements

The technology was designed by the On-farm Research Division (OFRD) of BARI and tested in different agroecosystems. OFRD has a network of field sites in the vulnerable areas with sub professional posted at the field level. DAE is mandated to transfer technology with sub professional posted at the village level. The two groups of workers may jointly implement the production system. DAE will have the lead role. SRDI monitor the soil fertility and salinity. SRDI may also be included in implementation of the activity. The targeted areas are not traditionally potato growing. Potato seeds are not locally available. Seed tuber and fertilizer cost is high. Affected community would need credit for the purpose of cultivating the crop. Thus, other than OFRD, BARI, DAE, SRDI, BADC Krishi Bank and NGOs have to be included in the implementation of the programme. BARC should be in charge of overall coordination of the project. A mechanism has to be developed. Implementation of the activity might require services of local consultant having background in farming systems. Although the floating bed technique of vegetable production is a farmers' practice, scientists from OFRD, BARI attempted to refine it to be more productive and profitable. A team of researcher and extension official joined by NGOs might extrapolate the technology. Implementation of the activity might require services of local consultant having background in farming system.

Primary implementing agency: BARI (OFRD)

Secondary implementing Agencies: DAE, SRDI, KB, NGOs

Risks and barriers

- During design stage of the technology no other risk except rodents making holes beneath the mulch was noticed. The rodents can be controlled with available crop production practices;
- Potato seeds in the flood affected areas especially in the northeastern areas are not normally available because these areas are not traditional potato growing areas. Government or NGOs would have to take initiatives to deliver the potato seeds at the farmers door step;
- The crop would require sufficient mulch material;
- During the design stage peoples expressed mixed reaction about the technology because it was not targeted to flood-affected community;
- Affected community need to be motivated to adapt the technology.

Evaluation and monitoring

As the technology is different from the traditional ones it will require services of local consultants preferably from the group of scientists who designed it. Close and constant monitoring during the implementation will be required in the field.

An independent monitoring team of the professionals from research and extension would be necessary to monitor and evaluate performance of the technology. BARC would form a multidisciplinary monitoring and evaluation team.

COST

- The technology would require high cost of production because of high cost of seeds (60%). Total cost would depend on the block size (preferably 5 ha each of 10 farmers) in one hand and the number of such blocks (1000 block).
- This can be worked out when there is policy decision on size of unit block and number of such block.
- Farmers and sub professionals at the field level would require training on the concept and production package of the technology.
- Audiovisual aids would be needed for the training activities.
- For dissemination of the technology sufficient field days would be necessary.

- A comprehensive budget has to be worked out for the purpose.
- Total cost will depend on size of the unit bed preferably one meter in breadth and 4 meter in length) having 20 such bed in a cluster and 1000 such clusters.
- Sufficient number of field days has to be organized to explain the merit of the technology so that more farmers adopt the technology.

An indicative and tentative financial resource estimate for five years is provided as below:

Full project: USD 6,500,000

Project design: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 13

ADAPTATION TO FISHERIES IN AREAS PRONE TO ENHANCED FLOODING IN NORTH EAST AND CENTRAL REGION THROUGH ADAPTIVE AND DIVERSIFIED FISH CULTURE PRACTICES

TYPE OF PROJECT

Intervention (with research, policy and awareness raising elements)

RATIONALE

Flood is an annual phenomenon in Bangladesh. However, recent experiences show that both frequency and intensity of flood has increased and every year many parts of the country is devastated by floods, often causes losses to agricultural crops, livestock and other assets. Every year hundreds and thousands of culture ponds float due to floods resulting in the loss of fish and the poor fish farmers incur financial losses. Sometimes, they are assisted by the government under the after-flood rehabilitation programs. However, this is not a long-term solution to the problem. Therefore, adaptation to the changing hydrodynamic phenomena should be developed and practiced in order to avoid or reduce the devastating effect of floods. The projected increase in rainfall will further aggravate the situation. Presently, culture fisheries contribute more than 50% to the total fish production from inland waters in the country and are mainly represented by pond culture of fish. Sometimes, as an adaptive effort some farmers are used to increase the height of pond dykes and/or put fence around the pond in order to protect their fish from escaping. However, this is not widely practiced. Increasing height of pond dyke above the flood level is usually not cost-effective. Promotion of net and other fencing remains as viable option for protecting fish from floating and thus could reduce the fish crop loss.

DESCRIPTION

Objectives and activities

The overall objective of the activity is to reduce the fish crop loss from increased flooding and promote adaptive viable options for fish culture suitable for the flood prone areas of Bangladesh.

However, the specific activities would be:

- promote/introduce net fencing of ponds to prevent escaping of fishes from culture ponds;
- promote pen and cage culture of fish in floodplain areas during flood season with as an alternate option for fish culture.

Inputs

Inputs will be required in the form of transportation, production of awareness and training materials, awareness creation activities, organizing training programs, demonstration of pen and cage culture techniques and net fencing, etc.

Short-term outputs

- Protection to flood vulnerable culture ponds and other culture facilities will be afforded which in-turn will ensure the financial benefits to fish farmers;
- Fish production from floodplain areas will be increased through promotion of pen and cage culture practices.

Potential long-term outcomes

- Socio-economic condition of the marginal farmers will be improved with more contribution to GDP;
- Adaptation strategies to increased floods is likely to be replicated in other flood vulnerable areas of Bangladesh resulting in the positive impact on fish production;
- Rehabilitation programs for culture fisheries after floods will not be required;
- Adaptation to floods will be achieved.

IMPLEMENTATION

Institutional arrangements

Department of Fisheries (DoF): DoF should be the implementation agency and should coordinate the all project activities, organize trainings, producing awareness materials. Fisheries Office at the Upazila level should directly be involved with field level implementation and supervising NGO activities.

NGO: Local NGOs could be engaged by DoF to carry out specific activities, like survey of ponds, promotional activities at the field level and mobilizing fish farmers.

Bangladesh Fisheries Research Institute (BFRI): BFRI could be employed for conducting research and impact assessment.

Primary implementing agency: DOF

Secondary implementing agencies: FRI, NGOs

Risks and barriers

Cost-effectiveness may determine the adoption of the practice. The landlords may take up pen culture practice. Replication of the practice would depend on the outcomes of the project and government willingness.

Evaluation and monitoring

The project progress should be monitored and evaluate internally on a quarterly basis by the project. Subsequently, technical and financial progress should be monitored and evaluated on a half yearly basis through BARC and donor agency team. Participatory monitoring could also be done involving the local community in the process.

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full Project: USD 4.5 million

Project design: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 14

PROMOTING ADAPTATION TO COASTAL FISHERIES THROUGH CULTURE OF SALT TOLERANT FISH SPECIAL IN COASTAL AREAS OF BANGLADESH

TYPE OF PROJECT

Intervention (with awareness raising and policy elements)

RATIONALE

Sea level rise and tidal surges will increase salinity of the coastal area and inward intrusion. Some area of the coastal area is already facing problems related to salinity. In spite of the shift in the biodiversity from freshwater species to salt water species, fisheries resources as a whole will have positive impacts from the climatic change in the area. The reason is that higher water levels and higher temperature regimes would lead higher productivity of the fisheries resources. However, individual coastal aqua farmers would need to adapt their culture practice to cope with more flooding with the sea water to get the best benefit of the higher productivity. Regional Consultation Workshops identified salinity problem and suggested to introduce and extend coastal aquaculture, predominantly with saline water fish species and shrimp. The activity is also complementary to the strategic plan and National Fisheries Policy. Although environmental issues are often raised, yet with the changing climatic scenario coastal aquaculture would be viable and pragmatic option.

DESCRIPTION

Objectives and activities

The overall objective of the project is to utilize the saline waters of the coastal areas to boost up fish production. However, the specific objectives of the project would be to:

- Develop culture technology for salt tolerant fish species having potential for use in coastal aquaculture;
- Piloting and promotion of developed aquaculture in the priority areas of coastal region;
- Develop linkages with weather forecasting agencies through networking;
- Helping the coastal aquafarmers, particularly the shrimp farmers, in protecting the crops from floods.

Inputs

- Collection of geo-morphological, meteorological and hydrological data: A wide range of data will be collected on the above areas with a view to understand the causes and effect salinity intrusion. These data will be used to build some predictive.
- Zoning of the coastal belt based on the predicted extent and intensity of salinity intrusion: Based on the collected information, the coastal belt will be divided into a number of zones depending on the extent and depth of inundation and timing of inundation by saline water. The purpose of zoning would be to formulate fisheries or aquaculture strategies suitable for each of the zones.
- Develop culture packages for a number of potential salt tolerant fish species to be used in different identified zones of the coastal belt: A number species suitable for culture at different salinity regimes and at different depths, representing different identified zones. The culture period should be short. Appropriate technology for their propagation and farming will be developed. Emphasis will be given on the pond and pen culture of fish.
- Piloting of culture technology in limited area in a priority zone: The developed technology will be piloted in order to adjust to local conditions. This piloting will be done in small area of a prioritized area of the coastal belt.

- Promotion of piloted culture practices in a prioritized zone of the coastal area: Extension activities will be undertaken to boost up the developed and piloted culture practices in a highly prioritized zone of the coastal belt.
- Identify the threats in existing shrimp farms and recommend remedies to mitigate the threats: Many existing shrimp farms are presently subjected to tidal surge and floods resulting in crop loss. Threats from all potential sources would be identified and assessed and possible mitigation measures will be recommended.
- Suggest potential new areas for shrimp culture within coastal areas: Analyzing the data collected through the project new potential areas for shrimp culture will be identified.
- Undertake promotional activities for shrimp culture: Promotional activities like farmer contact, providing training, counselling, booklet and poster production, providing some inputs to farmers, organizing rallies, hatchery development etc. could be undertaken.
- Disbursement of livelihood support fund: Fund will be disbursed to most vulnerable section of people, particularly vulnerable women for undertaking AIG activities.

Short-term outputs

- Development of a comprehensive database on the geo-morphological, ecological, biological, meteorological and hydrological information of the coastal area of Bangladesh;
- Development of culture technology for a number of fin fish species suitable for culture in shallow saline waters;
- Expansion of aquaculture in the area vulnerable to climate change;
- Increased production of fish and shrimp.

Potential long-term outcomes:

- Culture practices replicated and fish production increased;
- Socio-economic of the coastal people improved.

IMPLEMENTATION

Institutional arrangement

Bangladesh Fisheries Research Institute (BFRI):

BFRI will undertake all data collection activities, development of culture technologies, piloting of the technologies, identification of suitable culture areas and training to farmers.

Primary implementing agency: Department of Fisheries (DoF)

Secondary implementing agencies: FRI, NGOs

Risks and barriers

- Past information about meteorological parameters, biophysical parameters, etc. may not be readily available as per necessity of the project;
- Appropriate personnel to make a CBEC committee may or may not be available;
- Uncertainty of local salt and aqua farmers' cooperation;
- Guarding against poaching/theft of experimental fish may not work properly;
- Severe cyclonic storm may damage the experimental enclosure fully or partly.

Evaluation and monitoring

Evaluating and monitoring authority: Bangladesh Agricultural Research Council and/or financial support provider

Frequency of evaluation and monitoring: Half Yearly and Annually

Type of evaluation and monitoring: Both financial and physical

Method of evaluation and monitoring: Progress report, workshop presentation and field visits.

COST

An indicative and tentative financial resource estimate for five years is provided as below:

Full project: USD 4 million

Project design: USD 50,000

BANGLADESH

NAPA PRIORITY PROJECT NO. 15

EXPLORING OPTIONS FOR INSURANCE TO COPE WITH ENHANCED CLIMATIC DISASTERS

TYPE OF PROJECT

Research (with policy elements)

RATIONALE

Insurance can be a significant means of risk reduction for different vulnerable sectors, including property, infrastructure, agriculture, etc). However, the insurance market and its possibilities is little understood in these different sectors.

DESCRIPTION

Objectives and activities

- To explore the possibility of insurance market for climate vulnerability in different vulnerable sectors in the country.

Inputs and Activities

- Experts on insurance and different sectors (including infrastructure, agriculture, transport, etc) to be hired to carry out study in consultation with stakeholders from vulnerable sectors.

Short-term outputs

Policy recommendations on how to develop the insurance market to reduce risk of climate impacts.

Potential long-term outcomes

- Improved risk reduction of key vulnerable sectors through insurance market.

IMPLEMENTATION

Institutional arrangement

Primary implementing agency: DOE (to hire consultants and experts).

Secondary implementing agencies: Universities, Research institutes.

Risks and barriers

- Possibility that insurance companies may not wish to invest in climate sensitive areas.

Evaluation and monitoring

- Review committee to review study reports.

COST

An indicative and tentative financial resource estimate for the activities provided below:

Full Project: USD0.2 million

Project design: USD 25,000

