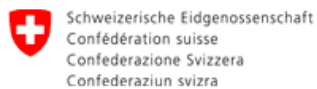




ANNUAL PROGRESS REPORT 2013

Community Based Adaptation to Climate Change through Coastal Afforestation in Bangladesh



Swiss Agency for Development
and Cooperation SDC



Kingdom of the Netherlands



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Acronyms

ACF	Assistant Conservator of Forest
ADB	Asian Development Bank
ALM	Adaptation Learning Mechanism
BARC	Bangladesh Agricultural Research Council
BCCSAP	Bangladesh Climate Change Strategy and Action Plan
BFRI	Bangladesh Forest Research Institute
BWDB	Bangladesh Water Development Board
CF	Conservator of Forest
CFD	Coastal Forest Division
CCF	Chief Conservator of Forest
CPAP	Country Program Action Plan
CSO	Chief Scientific Officer
DAE	Department of Agricultural Extension
DC	Divisional Commissioner
DD	Deputy Director
DCF	Deputy Conservator of Forest
DEFDC	District Environment and Forest Development Committee
DFO	Divisional Forest Officer
DDMC	District Disaster Management Committee
DRF	Disaster Response Facilities
DO	Divisional Officer
DoA	Department of Agriculture
DoE	Department of Environment
DoF	Department of Fisheries
DoL	Department of Livestock
EKN	Embassy of the Kingdom of the Netherlands
ERD	Economic Relations Division
FD	Forest Department
FI	Field Investigator
GEF	Global Environmental Facilities
IMED	Implementation, Monitoring & Evaluation Division
IPCC	Intergovernmental Panel on Climate Change
LDC	Least Developed Countries
MoA	Ministry of Agriculture
MoL	Ministry of Land
MoEF	Ministry of Environment and Forests
MoFL	Ministry of Fisheries and Livestock
NAPA	National Adaptation Programme of Action
PMU	Project Management Unit
PSO	Principal Scientific Officer
PSTU	Patuakhali Science & Technology University
RO	Research Officer
SDC	Swiss Agency for Development and Cooperation
SUFO	Senior Upazila Fishery Officer
UAO	Upazila Agriculture Officer
UNDP	United Nations Development Programme

CONTEXT

Climate change is increasing vulnerability in disaster prone coastal areas of Bangladesh. Changing nature and intensity of seasonal weather and natural hazards is affecting life and livelihoods of coastal people in many ways. While tropical cyclone and storm was recognized as key threat to coastal areas in the last decades, changing inundation level with erratic rainfall caused seasonal water logging. Agriculture as one of the key income generating sources is affected with these water related stress including salinity intrusion. While large part of coastal population depends on open fishing from river and sea for principal source of livelihood and income, changing sea weather, particularly increasing cyclonic wind on the Bay of Bengal affect fish catch.

Since 1960s, protective measures have been recognized as priority need for coastal development in Bangladesh. Afforestation for building green shield against cyclonic winds; and earthen embankment to reduce direct effects of tidal surges has been historically proved to be effective measures to address disaster risk management effectively in coastal areas. Along with this disaster preparedness programme and community based early local institutions coastal people have been capable to withstand disaster shocks and save their lives and livelihoods. However, climatic risks have sizeable and increased impacts on livelihoods through water logging or salinity retention in agriculture or aquaculture ponds. About 70% of the coastal lands remain periodically fallow for 4 to 6 months in a year particularly in the exposed coastal areas. Nearly 50 percent of lands used for agriculture and aquaculture are increasingly becoming sensitive to salinity through inundation effects.

Livelihood of coastal communities are generally sensitive to climatic hazards where particular single occupation group like fishermen, landless and small-scale farmers remain hard hit to environmental changes. Traditional livelihood measures of these groups are associated with only agriculture or fishing through either of these lack advanced technology, information and use of appropriate knowledge to hazard risk management. Lack of alternative livelihoods or climate resilient land use techniques and protective measures or access to external institutional services landless and marginalized farmers groups are highly sensitive to current and future effects of climatic hazards and have lower adaptive capacity.

The National Adaptation Programme of Actions (NAPA) and Bangladesh Climate Change Strategy Action Plan (BCCSAP) focused on diverse social, ecological and economic issues of climate change in coastal areas. The “Community Based Adaptation to Climate Change through Coastal Afforestation (CBACC-CF)” is the priority project of the NAPA under financial assistance of GEF, UNDP, the Swiss Agency for Development and Cooperation (SDC), EKN and Bangladesh government, currently implementing project in vulnerable four coastal districts- Barguna, Bhola, Noakhali and Chittagong. The broader goal of the project is “to reduce vulnerability of coastal communities to the impacts of climate change induced risks”. Led by the Ministry of Environment and Forest (MoEF) the project has implementing partners: the Forest Department (FD), Bangladesh Forest Research Institute (BFRI), Department of Agricultural Extension (DAE), Ministry of Fisheries and Livestock (MoFL), Ministry of Land (MoL), Bangladesh Water Development Board (BWDB) and the United Nations Development Programme (UNDP).

The project is based on community based approach for afforestation programmes and livelihood diversification activities for enhancing resilience of the protective ecosystem and adaptive capacity of coastal communities. Most important role of the project is to sustain the protective roles of coastal forests through mangrove and non-mangrove plantation; introduce climate resilient livelihood practices and land uses to create recurrent resource and income generation options; and improve capacity of institutions and community to address climatic risks and developing policy recommendations for mainstreaming climate resilient approach in national policies. There are manifold benefits of the project delivering for adaptation and mitigation and such developing climate resilient coastal ecosystems. The following four operational components of the project are:

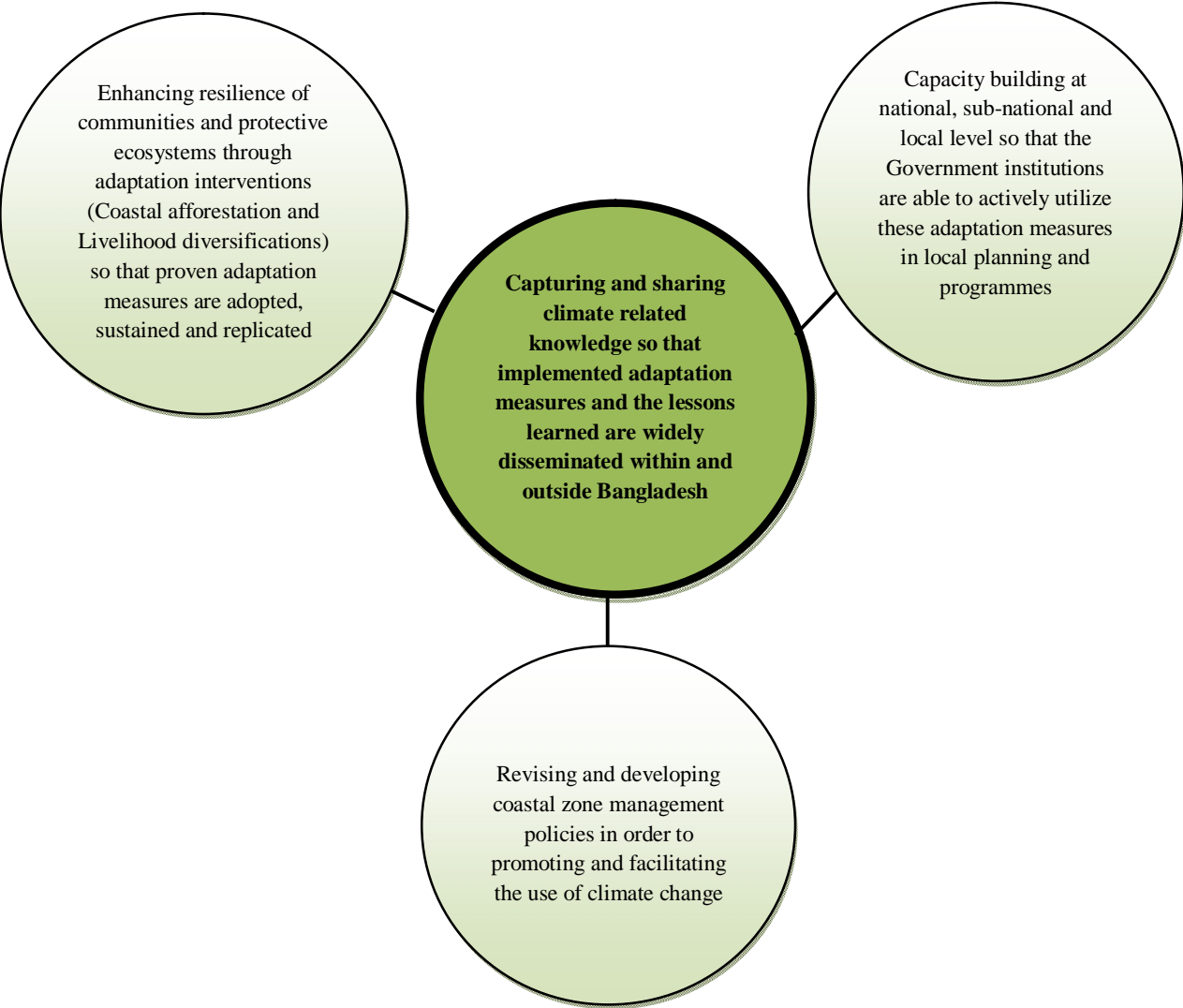


Figure 1: Strategic framework

LIST OF EVIDENCES

The following significant evidences have been collected and highlighted as key results over the past two years and incorporated to finalise the current annual report of the project:

- Community Vulnerability Assessment conducted in 8 project sites.
- Preparation of Adaptation Management Plan made for 4 project sites and new 4 sites are underway.
- Capacity building training programmes implemented for upazila and district level GOB officials including CBOs and women members as well as skill development training programmes conducted for coastal community in 8 project sites.
- Resilience of protective ecosystems enhanced through different types of afforestation interventions.
- Livelihood diversification programmes for enhancing resilience of coastal communities.

To the end, the project management unit coordinates all implementing departments for successful implementation of project activities. On the other hand, the project field offices organized participatory meetings with household beneficiaries to draw their status and key achievements after project support. Each household beneficiary maintains adaptation cards to record their field activities and production of particular seasonal crops as well as key incomes. Based on monthly, quarterly and annual data collection, the project applies rigorous participatory approach for data collection at all levels. Most of the applied tools for drawing the success evidences are Household Livelihood Security (HLS), Most Significant Changes (MSC), Key Individual Interview, Case study, Observation, Photography and Video Documentation.

HLS has been done with individual beneficiary to draw comparison of their baseline with current income to find their improvement towards adaptation capacity. Based on random sampling the beneficiaries were selected from different project interventions including Forest, Fisheries, Agriculture and Livestock. The MSC was conducted to document the significant changes the beneficiaries achieved in terms of their social, ecological and economic perspectives. A number of case studies conducted based on observation and successful achievements of the individual beneficiaries. The field staffs of the project accomplished the case studies and collection of progress data from implementing govt. departments.

As a part of routine monitoring plan, the project field staffs and implementing gov. departments conduct regular monitoring to observe and record the weekly and monthly practices of the beneficiaries, significant achievements and challenges. Besides, all National Experts, members of Mid-Term Evaluation Team conducted intensive monitoring of field activities and documented in their reports. Their recommendations have been incorporated in the revised Pro-Doc, some of which already adopted by the project during the result reporting period.

Apart from that Photography and video documentation were made for intervention wise resource delivery as well as outputs achieved by the beneficiaries in different project sites. Successful evidences and impact of project interventions were also documented in different printing and electronic media coverage.

INDICATOR PROGRESS

Outcome (From CP)	Indicators (From UNDAF and AP IWP)	2013 Target (From UNDAF and AP IWP)	Progress towards 2013 Targets
Outcome 1 – Enhanced Resilience of Vulnerable Coastal Communities and Protective Systems to Climate Risks	Percentage of locally designed, sustainable adaptation measures demonstrating effectiveness in reducing climate vulnerability	By end of the project, over 80% of the adaptation measures employed by the project demonstrate their effectiveness and sustainability in reducing climate vulnerability in coastal communities.	<ul style="list-style-type: none"> Project progress report and end of project evaluation report. Conducted Mid-Term Evaluation of the project and submitted final report.
Output 1.1 – Community-Based Adaptation Initiatives Defined for 4 Upazilas	Number of CBA plans developed with active participation of local communities for afforestation, livelihood diversification, and local warning systems	By the end of the project, development of CBA plans on coastal Afforestation, livelihood diversification and extreme climate warning communications for each site completed (12 total).	Development for CBA Mgt Plans for new project sites is underway.
Output 1.2 – Climate-Resilient and Community-Based Coastal Afforestation Measures Implemented	Number of hectares of mangrove and non-mangrove species planted and continuously maintained by communities	By the end of the project, 9000 ha of mangrove species by Forest Dept.	<ul style="list-style-type: none"> By the end of 2013, 2500 ha mangrove plantation completed. Overall 8500 ha coastal Afforestation with mangrove species completed .
		By the end of the project, more 112 ha Dyke plantation made with non-mangrove species.	<ul style="list-style-type: none"> By the end of 2013, more 72 ha have been made and more 576 families involved in resource generation model. Overall non-mangrove Plantation with Dyke including FFF Model completed in 112 ha.
		By the end of the project, 332 ha mound plantation made with non-mangrove species.	<ul style="list-style-type: none"> By the end of 2013, more 100 ha mound plantation completed. Non-mangrove Plantation with Mound completed in 332 ha.
		By the end of the project, 680 km strip plantation made.	<ul style="list-style-type: none"> By the end of 2013, more 400 km strip plantations completed. Overall Strip Plantation made in 680 km.
		By the end of the project, 200 ha model demo. made	<ul style="list-style-type: none"> By the end of 2013, model demonstration in more 50 ha completed. Overall Model Demonstration completed in 150 ha by introducing 10 commercially important mangrove species.
	Number of people trained and participating in mangrove nursery and maintenance	<ul style="list-style-type: none"> By the end of the project, 12200 people trained on mangrove nursery establishment and community-based forest management by Forest Dept. 	Total 12700 coastal people already trained including 500 coastal people in 2013.
Output 1.3 – Climate-Resilient Livelihood Options Enabled and Promoted	Number of households in target upazilas with access to climate resilient livelihood options	By the end of the project, 715 households in each of the target upazilas have actively expanded their livelihood options through the project (2860 total) and at least 1000 coastal people in each upazila engaged in training measures (4000	More than 1600 HH actively involved in training and promotion of agricultural adaptation measures to promote alternative livelihood options.

		total)	<p>By the end of 2013, 1320 Coastal people trained in improved Agricultural Technologies and 380 HHs involved in the promotion of improved Agricultural Demo.</p> <p>Fisheries = 380 HH involved in Fishery based Demonstration and 280 HHs in Training measures.</p> <p>Livestock = 325 HHs involved in Livestock based Demonstration measures and 710 people in training measures.</p>
<p>Output 1.4: Warning Communications for Extreme Climate Events Improved.</p> <p>Target: By Year 3, assessments of local early warning needs, as required for sustainability of climate-resilient alternative livelihood options, conducted in communities in target upazilas (4 assessments in total).</p>	No change	By Year 3, Assessments of local early warning needs, as required for sustainability of climate-resilient alternative livelihood options, conducted in communities in target upazilas (4 assessments in total).	Assessments of local early warning needs, as required for sustainability of climate-resilient alternative livelihood options is underway.
<p>Output 1.5: Enhanced resilience of coastal communities through improved water management</p>	<p>Water management infrastructures with plantations developed and livelihood services ensured for coastal Communities.</p> <p>New Baseline: No specific Water Management infrastructures exist to ensure the protection of coastal communities from external shocks.</p>	<ul style="list-style-type: none"> By the end of the project, 4.07 km of single dyke structure excavated with mangrove in the seaside and drainage inside. By the end of the project, 4 fresh water reservoirs being utilized by the communities for fish culture and irrigation. By the end of the project, 640 targeted households who initiated/expanded at least one business with support from the project. 	<ul style="list-style-type: none"> Excavation of 4.07 km single dyke structure and 4 fresh water reservoirs is underway to enhance resilience of coastal communities through improved water management. Arrangement for 320 HHs has been made to expand livelihood services through water management.
<p>Outcome 2 – Climate Risk Reduction Measures Incorporated into Coastal Area</p>	Percentage of national planners, district authorities, and communities able to identify climate risks and prioritize, plan, and	<ul style="list-style-type: none"> By the end of the project, >75% of local authorities in the project sites have identified climate risk and developed strategy and action plans through participatory process 	
<p>Output 2.1 – National Planners and Policymakers Trained in Climate-Resilient Coastal Development</p>	<ul style="list-style-type: none"> Number of capacity building materials and tools developed Number of national training seminars 	<ul style="list-style-type: none"> By the end of Year 3, 5 briefing notes, 5 fact sheets, and 1 cross-sectoral guideline for climate-resilient coastal planning developed and disseminated By the end of Year 3, 2 national training seminars for relevant national ministries and organizations on climate-resilient coastal planning conducted (2 total). 	<ul style="list-style-type: none"> In 2013, 1 factsheet and 1 knowledge product on climate change adaptation actions in Bangladesh published and preparation of 4 more fact sheets is underway. Shifted in 2014.

Output 2.2 – District Officials Trained in Facilitating Community-Based Adaptation	Number of regular district-level climate change seminars	By the end of Year 3, 3 climate change seminars conducted in each target district (12 total)	12 district level training seminars conducted and district training completed in 2012.
	Number of district officials with a deeper understanding of climate risks and CBA options in their districts	By the end of the project, 16 exposure visits to project sites made to enhance knowledge on CBA and sustainable management of protective systems	Necessary arrangement for conducting four (4) exposure visits from one from one district to another district have been made, but not completed due to unavoidable circumstances.
Output 2.3 – Upazila Officials Trained in Promoting and Facilitating Local Climate Risk Resilience	Number of local officials and representatives working on coastal management able to support CBA	<ul style="list-style-type: none"> • By the end of year 2, 4 co-management committees (CMC) 1 in each upazila formed and conduct quarterly meeting/training for promotion and facilitation as Local Climate Risk Resilience. • By the end of the project, 500 upazila level GoB and NGO officials trained in promoting and facilitating local climate risk resilience integrated in the upazila development plans (total 500 officials). • By the end of the project, 2 upzila level civil society network guided by UzDMC, act as “Local Climate Resource and Support Center(LCRSC)” and 1 Coastal Adaptation Learning Center (CALC) established in one project upazila. 	<ul style="list-style-type: none"> • CMC formed at the initial period of the project and eleven CMC meeting conducted in 2013. • In 2012, 314 Upazila GOB and NGO officials trained. • Establishment of CALC is under active consideration.
Output 2.4: Union Officials and Community-based Organizations Trained in Climate Risk Reduction.		<ul style="list-style-type: none"> • By the end of the year 3, 500 local union porsihad officials, vulnerable community people and 100 women members from 4 target upazilas trained and able to assess, plan and implement CBA measures (600 total) and community awareness training including 100 persons CBO rep. Redcross, etc (700 total). • By the end of Year 3, 1 Union-Level Climate Change (ULCC) network/Climate Clubs established to raise community awareness of climate risk reduction, local participation, decision-making, and livelihood security in each upazila (4 total) 	<ul style="list-style-type: none"> • In 2013, 509 nos. GOB, CBO, NGO officials including union parishad chairmans and women members trained. • Overall training programme completed for 974 persons.
Output 2.5 – Community Awareness Campaign Conducted on Climatic Risks and Community-based Adaptation Defined and Implemented	Number of Participatory Rural Appraisals (PRA) Number of households aware of climate change risks and adaptation measures	By the end of the project, Eight (8) PRA conducted, one in each target upazila to improve understanding of capacity needs in target communities on longer-term climatic and environmental changes (8 total)	In 2013, four (4) PRAs completed in four new project site. Four PRAs in respective project sites already completed by 2012.
Outcome 3 – National Policies Revised to Increase Climate Risk Resilience of Coastal Communities	<ul style="list-style-type: none"> • Number of policies and government action plans that support climate resilient development • Percentage of civil servants reporting that 	By the end of the project, at least 2 national policies or action plans on coastal management and 2 on land use are revised to promote sustainable, climate-resilient development	

	policies have been revised to improve climate resilience in coastal communities		
Output 3.1 – Policy Effects on Livelihood Resilience Analyzed and Policy Recommendations Developed	Number of policy reviews /Number of policymakers receiving background notes and policy recommendations on climate-resilient livelihoods	<ul style="list-style-type: none"> By the middle of Year 2, 1 comprehensive review of policies that support or impede climate-resilient livelihoods in coastal communities conducted 	Draft Climate Resilient Policy Recommendations for 4 sectoral policies prepared and now under validation process.
Output 3.2 – Land Use Policies Promote Sustainability of Protective Systems in Coastal Areas	<ul style="list-style-type: none"> Number of land use policy reviews Number of land use policies promoting sustainability of coastal protective ecosystem 	<ul style="list-style-type: none"> By the middle of Year 2, 1 review of impacts of existing land use policies on the sustainability of protective greenbelt structures produced By the end of the project, at least 2 coastal zoning regulations promote resilient livelihoods and sustainability of protective systems 	
Output 3.3 – Coordination Mechanism for Climate-Resilient Policy Development and Coastal Planning Established	<ul style="list-style-type: none"> Number of institutional assessments conducted Number of documented agreements between MoL and FD 	<ul style="list-style-type: none"> By the end of the project, 1 assessment conducted of institutional roles and coordination regarding coastal zone management in target districts. By the end of Year 2, 1 agreement achieved and documented between the MoL and FD that ensures sustainability of protective ecosystems in newly accreted coastal lands target districts 	<ul style="list-style-type: none"> Development of framework for mainstreaming mechanism for climate resilient policy is underway. Draft documents for long-term transfer of newly accreted lands from MoL to FD for the sustainability of protective ecosystems is underway.
		<ul style="list-style-type: none"> During Years 2, 3, and 4 of the project, 1 coordination meeting for the District Steering Committee held each quarter in target districts 	In 2013, nine (9) coordination meetings held in target districts.
		<ul style="list-style-type: none"> By the end of the project, at least 80% of government officials and representatives of coastal management organizations attending quarterly coordination meetings report comprehensive information support on climate resilience and coordination with other organizations in coastal development planning 	Government officials are regularly attending quarterly coordination meetings.
Outcome 4 – Learning, Evaluation, and Adaptive Management Enhanced	Number of proposals, papers, and other documents that incorporate learning from the project	<ul style="list-style-type: none"> Adaptation measures piloted by the project are consistently modified and/or further improved, based on project experiences. All of the local authorities in the vicinity of the project sites have implemented some of the piloted adaptation measures outside of the project sites. 	<ul style="list-style-type: none"> 30 Lesson Sharing Dialogues completed in all project sites Printing of Video Document “Rays of Hope” completed
Output 4.1 – Project Lessons Captured in, and Disseminated through, the Adaptation	Number of contributions by the project to the ALM	By the end of the project, all project monitoring and evaluation reports are screened for inclusion in the ALM	<ul style="list-style-type: none"> By the end of 2013, at least 33 Lesson Sharing Dialogue completed and also shared with ALM. By the end of the project, at least 4 proposed or ongoing coastal afforestation, livelihoods, or CBA programs draw on lessons and knowledge generated through the

Learning Mechanism		<p>By the end of the project, key project lessons are captured and disseminated through the ALM</p>	<p>project Website: www.cbacc-coastalaffor.org.bd., developed and regularly updated</p> <ul style="list-style-type: none"> • The project progress and significant lessons have been shared in different national and international Knowledge Sharing Platforms such as: <ul style="list-style-type: none"> •Regional Climate Change Adaptation Workshop, Thailand-2012; •Regional Colloquium on Mangrove Restoration (MFF), Chennai, India-2012. •Adaptation Practioner Days, side event organized by the GEF in collaboration with IIED, JICA, IDRC and CDKN, held at CoP 18 Doha • Disseminated through ALM WWW.adaptationlearning.net/country-profiles/bd
Output 4.2 – Project Knowledge Shared with Other Regions and Countries Facing Climate-Induced Coastal Hazards	Number of organizations and individuals actively involved in knowledge transfer activities within and outside of Bangladesh	By the end of the project, 1 national and 1 international workshop on coastal Afforestation and other climate-resilient livelihoods conducted (2 total) with at least 100 participants each	Shifted in 2014.
Output 4.3 – Project Knowledge Incorporated into Other Coastal Afforestation and Livelihoods Programs in Bangladesh	Number of follow-up/replication projects within Bangladesh designed on the basis of project lessons	By the end of the project, at least 1 follow-up/replication project within Bangladesh are designed on the basis of project lessons	One follow-up project designed on the basis of existing project lessons which has been approved by GEF secretariat and now under project formulation stage.

KEY RESULTS

The year-end review meeting (2013) with UNDP-CO highlighted that the annual reporting should be made on evidence based results including the associated problems and their innovative solutions made by the project till today.

I. Major Problems:

- Coastal areas are the confluences of many natural hazards and changing nature and impacts from global climate changes. In the recent decades, key climatic hazards are observed in terms of increased frequency of cyclonic wind and storm surges; salinity concentration in the surface water and soil; coastal inundation, and drainage congestion.
- Coastal communities perceive tropical cyclone and storm surges are the top hazards they understand for its extreme impacts. These hazards are most likely to be surprising for its impacts in future.
- Sea level Rise (SLR) is itself a hazard to trigger storm surges, tidal inundation and salinity intrusion with severe impacts.
- Soil salinity has been recognized another critical hazard as community understand it as persistent threat to now and future. Though the salt water is a stress in dry season, but the uncertainty of its effects is rapidly increasing due to changing fresh water flow, annual precipitation and undesired inundation events. Salinity intrusion in coastal land is increasing year after year and soil salinity exist in coastal soil from a few kilometers to 180km land ward. Due to salinity intrusion, about 70% of the coastal lands remain periodically unproductive for 4 to 6 months in a year particularly in the exposed coastal areas. Agriculture and aquaculture practices are exposed to storm surges and tidal inundation due to lack of diversified technology for fresh water irrigation and avoiding salt-water intrusion for 6 months in a year. Nearly 50 percent of lands used for agriculture and aquaculture to increasingly sensitive to salinity with storm surges and associated inundation regime. SLR is likely to exaggerate sensitivity of coastal lands to more unpredictable and excess effects of salt water.
- Coastal zone of Bangladesh covers 20% of the rice acreage of the country, while in most of the exposed coastal areas, rice is grown once in a year (during rainy season) with the use of local traditional variety due to higher level of salinity. The rest of the seasons, the lands remain fallow. The project areas have been found with pre-dominant single rice crop cultivation followed by a limited winter crops. There is mostly the size of crop production is related with land distribution and ownership pattern in the area. The PRA report of Barguna shows that about 10 % of the households in the area are landless who have neither homestead, nor farming lands; 30 % of the total households have homestead lands, but they don't possess any farming lands; and about 60 % of the households own the maximum land resources in the area (Fig. 3).

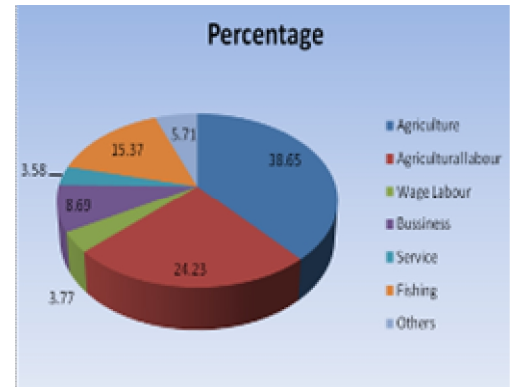


Figure 2: Livelihood pattern of communities in project sites

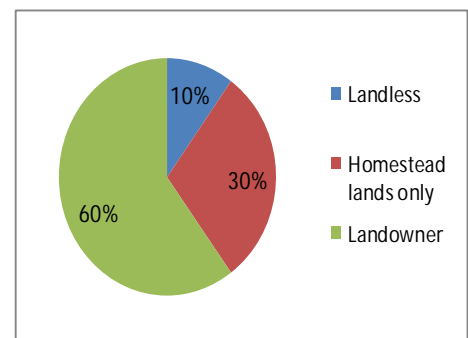


Figure 3: Land ownership pattern

II. Livelihood Related Specific Problems:

Livelihoods in the exposed coastal areas are highly dependent on selling of labor. In the fishing season, most of the fishermen communities serve as labor in fishing boats. Even in the off season of fishing, they have to migrate due to scarcity of productive sectors to engage themselves as labor. Moreover, their income from fishing has already been reduced to half compared to the last decade due to the increased number of sea signals per years that restrict the fishing boat to go for fishing. The livelihoods of coastal communities are highly dependent on climate sensitive sectors like Agriculture, Forestry, Fisheries and Livestock while most of the projects are targeted to only one of these major sectors and ended with the progress of sector wise implementation. Due to lack of alternative livelihoods or climate resilient land uses and protective measures or access to external institutional services these groups are highly sensitive to current and future effects of climatic hazards. Such sector wise split type of intervention can reduce the vulnerability of communities for time being or hardly for one season of the year. This type of piece meal approach even is not sufficient to cope with their annual vulnerabilities and hence innovative integrated approach is required that will provide recurrent benefits to increase the resilience of communities to withstand against climate change impacts beyond their annual vulnerabilities.

Solution through FFF model:

The CBACC-CF project has pioneered an innovative land-use model for providing climate resilient livelihoods for coastal communities living around coastal forests. The key part of the model, known locally as the Forest, Fish, Fruit model (Triple F, or FFF), uses largely encroached, periodically inundated and unproductive fallow lands behind mangrove forests to develop participatory ownership and adaptation practices. Much of this fallow land was open access property captured by local elites through encroachment for further deforestation. The FFF model was developed to explore new options for resource and income generation by integrating all four sectors-agriculture, forestry, fisheries and livestock in one system to sustain a continuous flow of resources. Land ownership has been transferred to coastal communities with tenure for diversified livelihood practices. A ditch and dyke system of FFF model has been established in 112 ha of coastal lands including 72 ha in 2013. In each hectare, eight ditches and nine dykes were developed and distributed to eight families, on a ten-year land ownership agreement with renewal opportunities depending upon the beneficiaries' performance.

Each family currently cultivates 6–7 types of leafy vegetables on a 60 m long and 3 m wide strip on top of the dyke. Scaffolding erected on the edges of the ditch provides space for creeping and hanging vegetables such as country bean, cucumber, bottle gourd, bitter gourd and sweet gourds. The dyke is also planted with two high-yielding fruit varieties: BAU-Kul (*Ziziphus mauritiana*) and BAU-Guava (*Psidium guajava*). Developed by the Fruit Tree Improvement Center of Bangladesh Agriculture University (BAU), they are a good source of vitamins and minerals, and produce yield (fruits) twice a year.

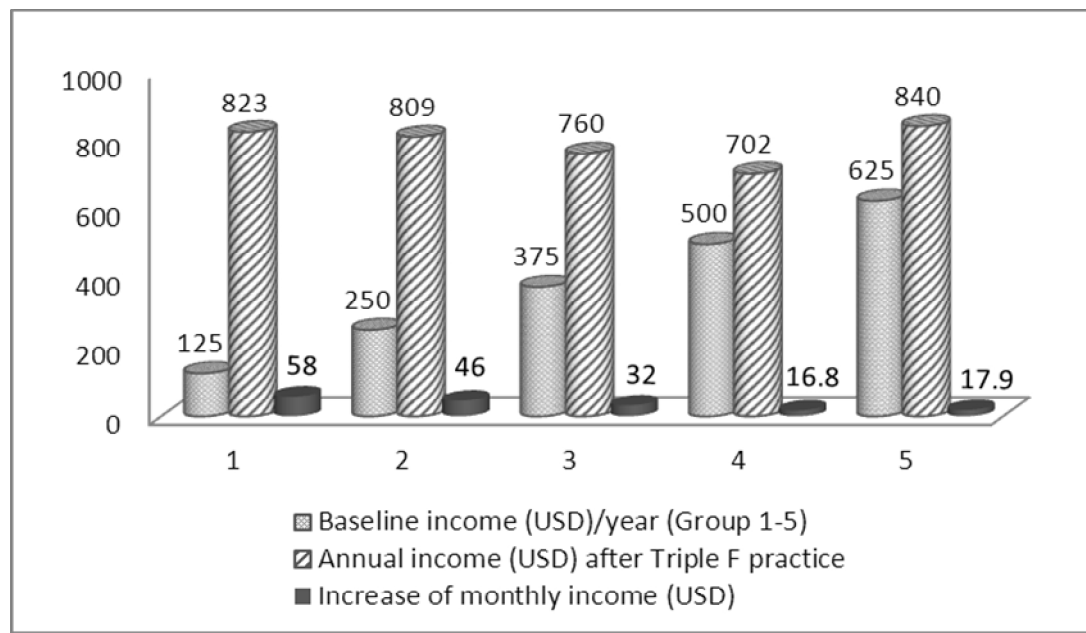


Figure 4: Enhancing adaptive capacity of coastal communities through Triple F model

- Short-term crops planted as dyke vegetation provide household foods and quick income generating options. In a year, the highly benefited families produced approximately 300 kg of leafy vegetables. Sale of the surplus vegetables after household consumption increased their family income around USD 120-150.
- Of the three types of adaptation intervention measures tested, aquaculture interventions are the most promising as the project areas are largely dominated by the fishermen or depending on fishing. A single ditch produces about 300–350 kg of fish yearly (i.e., two season cultivation), generating income of up to US\$450-500 from fish sales.
- The additional source of Triple F based income is also possible through duck rearing which already provides income up to US\$ 45-65.
- Depending on intensive management of ditch and dyke, it has been documented that highest family income ranges from US\$ 600-700 per year from Triple F. The best performer group (1-2) has been able to earn an additional income of more than BDT 54,444 (US\$698) per family in a year from their ditch and dyke allotment (Fig. 4) that monthly average income increases up to US\$ 60.
- Coastal communities have not only pursued regular, short-term and medium-term alternative income options, but also planted forest tree species on their dyke for long-term benefits. Planting trees and palms (*Cocos nucifera*) on dykes will provide communities with long-term timber and mid-term fuel wood from branch pruning, and also food (coconut) products.
- The project has until now been able to increase average annual income of landless groups from their baseline status i.e. increased high level adaptive capacity of landless beneficiary groups whose annual income was less than one dollar per day (Fig.4). This income from FFF interventions appears as additional income in addition to their routine livelihood activities even in the off-season (November to April). This increasing income trend creates opportunity to landless and marginalized groups to shift into higher economic level.

- Thus, the project has converted zero productive level of barren lands to highly productive regime through integrating all climate sensitive sectors in one model and empowered vulnerable coastal communities with land ownership rights incorporating recurrent resource and income generating options as well as saved the barren lands from encroachments. The project accommodated 8 families per hectare which is very significant for a land scarce country like Bangladesh.

Unlocking fortune of Shanu Mallick (Case Study)

“I have no land for producing enough food of my families; I have only to sell labor. The project taught me how to feed my family and save extra money”, said Shanu Mallick (42 years), from Sonatala village of Naltona Union, Barguna. Shanu is one of the Triple F beneficiaries of the project. Shanu is father of three children who lives along the Sonatala embankment. His life has long been bound for little earning without a better hope for living. He only managed food for his family by selling labor. Cyclone Sidr shattered his minimum way of living. His family was severely shocked, when he found hard to manage any job after Sidr and passed many days with his family with small foods. Life became ruthless in the last years when he got physically sick and sold 4 cows for medicine. His traumatic life started to wipe out after he was selected as a beneficiary with the project. “It was like dream for my family when the project invited me to be an owner of Triple F model. It took few days for me and family to believe we will own the land for 10 years to work on FFF model”. His access to land right without loan is the first time experience of his family life. “I have not seen such ditch and dyke system before. I learned from different training for cultivating of agriculture crops and fishes and duck rearing in new way”, said Sanu Mallick.



Figure 5: Shanu is one of the Triple F beneficiaries in Barguna project site

With the project support, he started producing agriculture vegetables on the dyke and duck cum fish rearing in the ditch of the land. In only three months, he saved BDT 10000/= from selling vegetables after his family consumption. He earned BDT 37,000 from selling fish and eggs of duck supplied by 2012. He realized that he can increase income if he manages some money for cultivating dyke vegetables in different seasons. He was successful to raise his annual income up to BDT 60,000/=. After the project, he repaired his house and dreamt to manage education for children. His wife is now working in their land to put extra efforts for generating some more income. They are confident that they have no food crisis by now-a-days and hoped that only better future is waiting for them. He has rented a land for paddy cultivation as he can pay from the saving of the FFF model. He expects that govt. will provide him additional services as he can cultivate on his own land in the project. His life is blooming with many fortunes in coming days.

Potential Scopes of Triple F Model

- The CBACC-CF project is the first project in Bangladesh where landless people and marginalized groups of society are accessing government lands through benefit sharing model. Land rights in the model empowered coastal communities to participate in local decision making processes, claim relevant services from government departments and secured their natural and economic capital as one of the important options for their resilience in climate change affected coastal areas. Accommodation of 8 families per hectare in FFF model is a significant approach for a land scarce country like Bangladesh. With the application of innovative land use technology, the project converted fallow coastal lands into multiple resource regime for adapting to current and future climatic risks.
- A bundle of adaptation interventions applied through integrating agriculture, fisheries, forestry and livestock management created provision for recurrent resource and income generation practices that ensures sustainability of adaptation interventions. Harvesting of rain water in ditch system secured fresh water sources for irrigation and maximizing fish cultivation throughout the year. It will reduce the migration of vulnerable fishermen during off fishing season.
- Innovative ditch and dyke structure restores productive quality of lands for current and future uses against salt water and tidal inundation effects. The type of land use system solved fresh water increased freshwater options through seasonal rainwater harvesting and irrigation purposes. It supports quick establishment of multiple type of ecosystems including multicultural, multilevel (due to structural arrangements) ecosystems behind the coastal mangrove forests that will provide enormous opportunities for future learning.

III. Ecosystem Related Specific Problems:

The ecosystem of coastal mangrove forest is dominated by monoculture species particularly with *Sonneratia apetala*. It can tolerate high frequency of inundation and serves as only pioneer species, suitable for plantation in newly accreted lands. Being a pioneer species in ecological succession, it is strong light demanding species and cannot grow under the shade of other trees and usually forms pure stands. Throughout coastal areas, it does not regenerate at all. This type of monoculture is further aggravated due to climate change impacts. On the other hand, out of 4444 nos. seedlings/ha from initial planting, only 800 to 1000 nos. matured trees/ha survives at its maturity indicating 75% gaps in tree stands/ha. It means that there is big opening in between matured trees. This type of greenbelt structure allows maximum penetration of tidal & storm surges and wind velocity causing destruction to the adjacent communities and their assets. Thus, the mangrove patches encountered increasing pressure of cyclonic wind and storm surges which also creates large opening or gaps within the forest and most likely to be increasing sensitivity of the protective vegetation in changing climatic stress. In order to enrich plant densities per unit area and sustain coastal vegetation and make the ecosystem climate resilient, what is urgently needed is to introduce other mangrove species to fill up these gaps of coastal forests. The mangrove patches encountered increasing pressure of cyclonic wind and storm surges which also creates large opening or gaps within the forest and most likely to be increasing sensitivity of the protective vegetation in changing climatic stress.

Solution through model demonstrations (Introduction of multicultural species):

To enrich and sustain coastal vegetation, the CBACC-CF project introduced 10 commercially important mangrove species as under planting within 150 ha of *S. apetala* plantation by 2013. This effort will increase number of trees per unit area preventing climate related wind velocity and other weather events. The introduced species are *Heritiera fomes*, *Excoecaria agallocha*, *Xylocarpus mekongensis*, *Cynometra ramiflora*, *Aegiceras corniculatum*, *Bruguiera sexangula*, *Phoenix paludosa*, *Nypa fruticans*, *Lumnitzera racemosa* and *Ceriops dacandra* which were previously evaluated and selected by BFRI for differently inundated coastal habitats. Thus, the CBACC-CF project introduced new coastal forest guidelines/large scale practices through large scale model demonstration that will increase forest productivity and sustain biodiversity throughout coastal areas.

- It is now increasingly recognized that well managed coastal ecosystems can help local communities adapt to current and future climate change hazards by providing a wide range of ecosystem services. This is one of the reasons why commercially important mangrove species have been introduced by the project.
- Mangrove plantation has enhanced adaptive capacity of the protective ecosystem through contributing to stabilization of new Char lands and function of the ecosystem against cyclonic wind and storm surges.
- Mangrove plantations provide physical protection, with some species are expected to trap sediments in their intricate root structure at such a high rate that can potentially reverse the effect of sea level rise or river erosion, through land reclamation and by bolstering the protective capacity of the coast against storm surges or cyclones.
- The innovative model plantation in the project provides policy impetus to understanding fast and slow effects of extreme events in coastal areas. This type of plantation approach will enrich plant density per unit area contributing to reducing wind velocity, tidal surges and other climatic events and ultimately increase the resilience of protective ecosystem. Long-term spatial and temporal risk management for mangrove sustainability and protection capacity of coastal communities is now incorporated by different types of afforestation interventions of this project.

IIIa. Other Ecosystem Related Problems:

The on-going afforestation activities are being carried out in the coastal areas to protect land and people from natural disasters. However, frequency of natural calamities has been increased in recent years and increasing the damage of existing planted area and creates maximum opening in between the trees that ultimately minimizes the resilience of coastal ecosystem. What is urgently needed is to involve local communities to cover newly accreted land surrounding the area where vulnerable coastal communities reside. The project has taken advantages of availability of new and moderate to highly accreted lands in project sites as well as community enthusiasm, and combines these opportunities to increase coverage of the greenbelt area with mangroves and non-mangroves to create a buffer zone. The sustainability of coastal afforestation requires participation of community in nursery establishment, plantation and maintenance activities and alternatively generating economic benefits.

Solution through community based coastal afforestation:

- Mangrove plantations have been established on 8,500 ha (including 2500 ha in 2013) by providing 178500 man-days cash-for-work (CfW) benefits (Fig. 6). Model plantation programme of BFRI is completed in 150 ha with long-term benefit sharing arrangement for 143 households.
- Non-mangrove dyke plantations (including the ditch and dyke arrangement of the FFF model) have been established in 112 ha providing 66,630 man-days benefits under CfW programmes, and also involving 896 families through land allotments.
- Non-mangrove mound plantations have been established on 322 ha with provision of 97,260 man-days in CfW programmes and involving 554 beneficiaries for long-term benefit sharing arrangement.
- Non-mangrove strip plantations totaling 680 km have been completed with the provision for 122,400 man-days CfW benefits and involvement of 3,400 people in long-term benefit sharing arrangement.
- As of today, the project provided 464,790 man-days benefits under CfW programme.
- The established 8500 ha mangrove plantation has a potential capacity for protecting 800,000 people in the project sites to date.
- Mangrove plantation has enhanced adaptive capacity of the protective ecosystem through contributing to stabilization of new Char lands and function of the ecosystem against cyclonic wind and storm surges. Mangrove species support to trap sediments in their intricate root structure at such a high rate that can potentially accelerates land reclamation and bolsters the protective capacity of the coast against storm surges or cyclones.
- Mound system plantation approach has opened multiple uses of fallow lands behind coastal forests and outside the embankment with non-mangrove species and seasonal paddy cultivation.
- Model plantation approach with mixed species increase number of trees per unit area preventing climate related wind velocity and other weather events. There is also additional contribution for increasing forest productivity and sustain biodiversity throughout coastal areas.
- Mixed plantation contribute to fill in the gaps of the existing and partially mangrove patches and so response diversity of the species can easily sustain the habitat structure to cope with current and future cyclonic wind and storm surges.

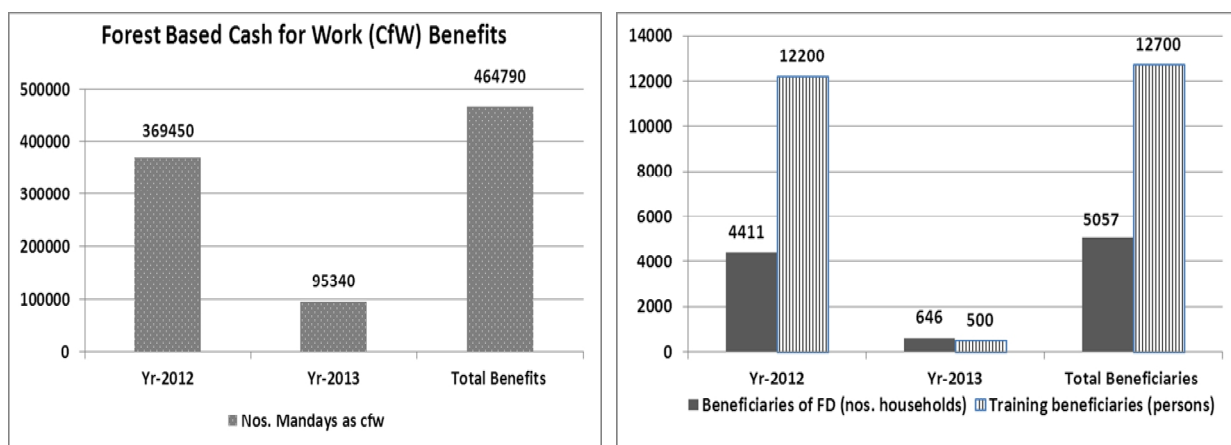


Figure 6: Forest based beneficiaries in different plantation and training measures

IV. Agriculture Crop Related Problems:

Agricultural practice is increasingly constrained with high level of salinity ingress and frequent and severe impacts of natural disasters in coastal areas. Given the impacts of seasonal water logging and salinity on land, and lack of irrigation in dry seasons, alternative cropping practice through use of climate resilient varieties have been a vital need for increasing agricultural production in the area.

Solution through introducing climate resilient and salt tolerant varieties:

The CBACC-CF project has introduced high yielding and salt tolerant rice variety (BR 47) in four coastal districts. Considering lower land productivity, the rice variety has been found potential crop in coastal areas. The BR 47 (Bangladesh Rice 47) variety has increased annual production from previously fallow and salinity affected lands and eventually fulfilled household food consumption. Largely coastal people depend on the traditional rain-fed Aman which is the single crop. The yield benefits from the demonstration reflect increasing people's attention in coastal areas for cultivating additional land in subsequent years. In only one project site of Barguna sadar upazila, there is currently 500 ha of lands cultivated with the rice variety BR 47. Demonstration of improved fruit varieties in farmer's fields in all project sites also motivated others to enrich their health nutrition and alternative income during off-farm seasons.

The paddy has yielded three times more production per hectare compared to traditionally used local varieties. Most of the coastal farmers in the project areas are accepting the double cropping pattern with the new variety to reduce seasonal risks and adapt to food crisis. Otherwise, it is not possible to secure household foods only depending on traditional rice cropping. The cultivation of the BR 47 variety requires less water and has tolerance capacity to certain level of soil salinity in dry season. Such spontaneously motivated and quickly spreading paddy area with BR 47 resulted scarcity of its seed sources for further cultivation in enlarged coastal areas that covered more than 1000 ha in 2013. These appears as additional economic benefits for the project beneficiaries from selling rice and seeds. Access to training of seasonal risk management, improved rice varieties and land use techniques is important for improving capacity building of the farmers in coastal areas. However, the initial cultivation of salt tolerant rice production system requires seed source and irrigation where external supports of extension services must be ensured.

Thus, the project converted single cropping to double cropping patterns in the previously fallow paddy lands that ensures not only food security of vulnerable coastal communities but also their additional income would increase their further coping abilities. By introducing salt tolerant rice technology the project is reducing salinity effects in traditional agriculture associated with storms surges and flooding events. The significant benefit of the rice farming technique was maximizing land uses while taking account of climatic risks in coastal areas. Since the technology demonstration, coastal farmers have increased use of seasonal fallow lands through shifting single to double cropping system and reduced household food deficits.

“Apart from introducing salt tolerant rice variety, the project demonstrated improved agricultural crop varieties including Chilly, Soybean, Maize, Guava and Jujube in four project sites. Till today, the project trained total 2520 coastal people on improved agricultural technologies and supported 960 households for demonstration of these crop varieties (Fig. 7). The impacts of these crop demonstrations have been recorded as significant example for climate resilient livelihood options to marginalized farmers. Involved beneficiaries have increased

their land use production and secured household food and nutrition requirements. Farmers are increasingly accepting these varieties with potential scopes for land uses in dry season.

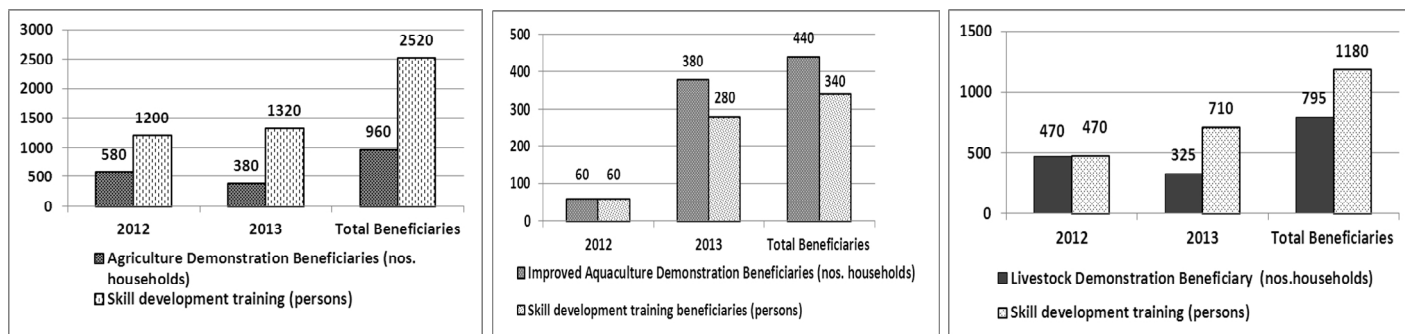


Figure 7: Agriculture, Fisheries and Livestock Intervention-wise Beneficiaries

Solution through livelihood diversification

Livelihood diversification approach of the project with improved aquaculture and livestock varieties enabled coastal communities to receive and apply advanced knowledge and practices. Coastal communities developed skills and increased production capacity from pond based aquaculture and livestock rearing through the integrated training and demonstration programmes. Under the technical support of local Fisheries Department, 280 coastal people received training on advanced aquaculture and 380 households have been involved in pond demonstration in 2013. With a total 440 households received demonstration supports and 340 persons trained to date (Fig.7). Beneficiary people have been knowledgeable and aware on pond preparation, maintenance of appropriate quantity of fingerlings in pond and precaution measures of cultivating different layer species. Through the multi-layer type fish culture, there has been found high level of profits possible for coastal families while they have limited options for agricultural land uses. This type of aquaculture is needed for securing household food and fulfilling the protein requirement. The financial return of aquaculture based practice ranges from BDT 40,000-150,000 per year. The average annual income of the families increased up to BDT 80,000 compared to traditional pond culture could only generate BDT 35,000.

Introducing improved livestock varieties (hen and cow) in remote coastal areas are other important livelihood sources to increase household food and income. 470 coastal families already received training on cow and poultry rearing and input support from local upazila Livestock Department. In 2013, 325 households received demonstration support of improved livestock varieties and 710 people participated in skill development training. A total 1180 persons received training and 795 households benefited from livestock demonstrations (Fig.7). The advanced knowledge enhanced people's capacity to adopt measures for increasing food production, taking pre-caution against seasonal disease and eventually contributing to household income generation. Compared to local livestock, the introduced poultry varieties are high yielding in terms of egg production and benefiting the beneficiary families for protein and additional income.

V. Policy Related Problems:

Most of the existing coastal policies address recurrent natural hazards, but largely ignores the new dimension of threats that are associated with gradual climate induced effects and its dynamic impacts on coastal communities. What is urgently needed is to review and analyze existing policies and develop framework for mainstreaming climate resilient policies into coastal zone management. Coastal areas have multiple resources including newly accreted lands, forests and aquatic bodies which are vibrant productive systems, but integrating climate resilient approach with these is important for enhancing adaptive capacity of local communities. The diverse range of social and ecosystem benefits of coastal lands and forests are not yet recognized from particular sectors and their contribution for short to long-term as well as small to large scale. Initiating climate resilient coastal policies of critical resources will be required to address integrated resource management and create sustainability.

Solution through developing climate resilient policies:

Attempt has made for developing climate resilient policy recommendations for **“environment”**, **“forest”**, **“land use”** and **“coastal zone management”** policies and framework for **mainstreaming climate resilient policies** in coastal zone management is underway.

VI. Institutional Capacity Related Problems:

Climate change concerns are relatively new and the understanding of climate change risks, impacts and potential adaptation measures is currently limited in the government officials as well as civil society members in Bangladesh. The capacity building training on climatic risks and hazards discussed key roles and services of institutions required for addressing the current and future impacts of storm surges and flooding and associated effects of sea level rise for coastal communities.



Figure 8: Capacity building of local government and community awareness on climate risk resilience

Solution through Capacity building training:

The project aims to reduce the climate vulnerability of coastal communities through capacity building, direct participation and creating awareness among communities in the targeted areas of Bangladesh. As part of capacity development activities, the project organized fifty four training programs on **“Capacity Building of Local Government and community awareness on Climate Risk Resilience”** and 974 GOB, NGO officials and CBOs including women members have been trained till today. In 2013, **“Centre for Development Services (CDS)”** already conducted 18 training programmes covering 509 GOB, NGO officials and CBOs including women members out of 950 (Fig.8).

The training programmes comprise 3 days for each batch including a field visit to respective project sites to get firsthand experience on what communities are doing and how they are benefitted through CBACC-CF project supported interventions. Causes of climate change, GHGs, sea level rise, why coastal communities are facing problems, mitigation methods, adaptive capacities, alternative livelihood opportunities, and roles to be played by local government representatives during any disaster are briefly discussed. As result, total 974 GOB, NGO officials and CBOs including women members enhanced their skills on climatic risk issues in coastal areas.

Key Achievements

Most of the projects are being implemented separately providing efforts either for adaptation or for mitigation concerns. The general ignorance is that any project may apply two-track of approach contributing to both local adaptation and global mitigation efforts. The project is working on a two-track approach – livelihood diversification and protective afforestation programme with a view to anchoring both adaptation and mitigation measures. As of today, the project enhanced resilience of 23,992 coastal families who have been involved with different adaptation and training measures. The livelihood diversification approach developed their skills in including forest, agriculture, fisheries and livestock sectors and enables them to actively utilize climate resilient adaptation measures. Besides, the project provided 464,790 man-days benefits from CfW programme.

With a total of 8500 ha of mangrove afforestation, the project has potential mitigation arrangements to absorb more than 850,000 tons of carbon annually. With such continued progress of afforestation, the per capita carbon foot print could be reduced to zero level through enhancing carbon sink capacity by mangroves. Recently, mangroves in the tropics are considered as the most carbon rich forests among all major forest domains of the world. The carbon sink capacity of mangroves is four times higher than non-mangrove species.

The project was selected as one of 10 finalists for People’s Choice Award out of 88 entries from 37 countries and received **“Runner-up Award 2013”** organized by ‘The Rare and Nature Conservancy’, USA in Washington D.C. Project achievement and lessons have already been shared within and outside Bangladesh contributing to proven and replicable solutions for adapting to climate change that have impact for both people and nature.

Financial Progress: (January-December 2013)

Atlas Activity	Outcome	Disbursement (USD)
ACTIVITY1	OUTCOME 1: Enhanced Resilience of Vulnerable Coastal Communities and Protective Systems to Climate Risks	1,709,257.60
ACTIVITY2	OUTCOME 2: National, District, and Local Sectoral Planners Incorporate Anticipated Climate Risk and Risk Reduction Measures into Coastal Area Management Frameworks	44,421.91
ACTIVITY3	OUTCOME 3: National Policies Support Increased Resilience to Climate Change Impacts in Coastal Communities	19,427.44
ACTIVITY4	Outcome 4: Learning, Evaluation, and Adaptive Management Enhanced	96,299.92
ACTIVITY5	Project Management Unit (PMU)	85,191.41
Total		1,954,598.28

Donor Wise Disbursement:

Donor	2013 Annual Disbursement USD
GEF-LDCF	656,937.06
SDC	581,839.80
EKN-JP	559,418.08
UNDP (TRAC)	156,403.34

Lessons Learned

- i. Provision of land ownership is important to empower landless and marginalized farmers in coastal areas through introducing them with innovative land uses and livelihood diversification approaches.
- ii. The potential scopes of Triple F solution created ‘windows of opportunities’ for decision-makers to develop options for climate resilient coastal policies in Bangladesh.
- iii. Group based livelihood practices are important to overcome free-rider problems in existing govt. lands (khas/fallow lands) of coastal areas and creating access of marginalized people in decision-making process.
- iv. Awareness building on climatic risk management and adaptation measures among the beneficiaries is important for disseminating the best practices among farmers.

- v. Institutional capacity building and communication supports to identification of critical lands and resource management system for coastal adaptation practices. The Deputy Commissioner of the respective project sites formed a land survey committee for new land demarcation to expand the activities.
- vi. Local CMC platform enhance collaboration among implementing govt. departments about their monitoring roles to identify the risks of livelihood interventions of the project, share in local committee and find quick solutions and improving technical support for beneficiaries.
- vii. Lack of government land for implementing innovative adaptation interventions appears as major problem facing the project. Implementing coastal land zone management in collaboration with influential stakeholders including govt. departments, elected people's representatives and civil society members can play vital roles to continue the activities. The issue of 'Khas Land' acquisition also appears as an important agenda in the 3rd NSC meeting and the roles of the Deputy Commissioner in respective sites have been highlighted.

Way Forward

The project focused on reducing climatic vulnerability in coastal areas through coastal afforestation and livelihood diversifications. Community based approach of the project justified why increasing collaboration among govt. departments and local communities are keys to strengthen institutional capacity for addressing climatic risks. The sustainability of the coastal forest will remain at the top of agenda for ensuring protective capacity of the existing mangroves to adapt to mounted risks of cyclonic wind and storm surges. Model plantation techniques of the project reflected long-term protection services in coastal areas can be possible with only sustaining mangrove vegetation. At the same time, coastal afforestation will harness scopes for carbon sequestration to contributing global mitigation efforts and local benefits of vulnerable coastal communities.

Developing land ownership is one of the pre-requisites for enhancing adaptive capacity of landless people while there is further required continuous support of local govt. departments for accessing services in coastal areas. The CMCs assured the assistance of the Department of Cooperative for building CBOs of the beneficiaries engaged in the Triple F model and subsequently mobilize their resources for empowering them. To maximize the economic benefits of the goods produced in the model seasonally and annually, the project is currently undertaking initiatives to promote local market shed for the beneficiaries. Due to remote social settings of the beneficiaries and lack of inadequate access of produced goods in local market, the proposed market shed in near distance of the community will provide opportunities for bridging with local business stakeholders.

The project organized field trips with international, national and local level printing and electronic media to disseminate the successful innovative evidences and draw the policy attention of the adaptation practices as well as civil society members, local people's representatives for extending the support in coastal areas. With the support of the project, coastal land use policy is currently under review to delineate land ownership and incorporate climate change related in dynamic coastal zone management. Lesson sharing dialogues with local govt. departments are organized to sensitize the importance of new livelihood models and replication of the potential adaptation practices in coastal areas.

The project organized numbers of field visits with national and international delegates to draw policy attention on the successful interventions. During field visit in the project areas, different international donors showed their views on the importance of the innovation and to replicate the adaptation practices due to observed multi-fetched benefits of the new livelihood practices alongside the coastal afforestation. The innovative livelihoods with mangrove afforestation through restoration of fallow lands and providing ownership of landless households have eventually got momentum across local, national and international stakeholders. For example, the grant money from SDC and EKN has already been incorporated in the revised project document to extend the project activities. Under the SDC funding, implementing govt. departments (DAE, DOF and DLS) are providing diversified livelihood training and demonstration measures. BWDB is currently establishing water management infrastructures (single dyke) with EKN fund to reduce water stress in highly exposed coastal area-Char Kukri Mukri union of Char Fasson upazila in Bhola district. Construction of 4 fresh water reservoirs are currently underway that will ensure community based livelihood and irrigation measures.

The establishment of Coastal Adaptation Learning Centre (CALC) under the project will be unique feature for institutionalizing on-ground experiences of adaptation practices in Bangladesh. CALC has diverse scopes for building collaboration among academics, researchers, development practitioners, local communities and associated other stakeholders, and sharing knowledge and learning in-hand experiences of adaptation.