

**REVIEW OF THE PROJECT
ON
REHABILITATION OF SIDR AFFECTED
SUNDARBANS STAKEHOLDERS**

Environment Entrepreneurship Development

30 December, 2008

Khulna, Bangladesh

Forward

The Sundarbans is the biggest mangrove forest in the world. The SIDR of 15th November 2007 was the incident that had been affected not only to the Sundarbans but also the whole country, especially the socio-economic and livelihood patterns to the southwest coastal region.

CCEC – Centre for Coastal Environmental Conservation is working for the uplifting the affected peoples of the region, especially for the real stakeholder groups of the Sundarbans, such as Mouali, Bouali and Jalley under a project entitle “Rehabilitation of SIDR Affected Sundarban Stakeholders”.

The project is reviewed independently by using the internationally recognized system of Paris Declaration and Hygo Principles along with the concept of Millennium Development Goals (MDGs). Based on the analysis, the researchers revealed that the project activities are reached towards the goal of the project. Most of the rehabilitations seem excellent for example, the formation of self-sustaining income generating cooperative society is now working towards the sustainable livelihood development of the stakeholders which is much more environmentally friendly, economically just and socio-culturally adaptable – overall the system is more integrative towards the rehabilitative mode of nature.

I am grateful to my students who are engaged themselves day and night and from field to computer writing of this evaluation process and wrapping up the project evaluation especially Mr. SK Abu Jahid, Mr. Khondakar Arifuzzaman and Mr. SM Tariqul Islam. I am also grateful to Mr. Mowdudur Rahman, Director of CCEC and his staffs suporting all kind of facilities for compilation of the report.

I wish a great success of the project endeavor.

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List of acronyms and abbreviations

ER.....	Evaluation Report
FD.....	Forest Department
GoB.....	Government of Bangladesh
MDGs.....	Millennium Development Goals
NGOs.....	Non-government Organizations Organization
UNESCO.....	United Nations Education Scientific and Cultural
HFA.....	Hyogo Framework for Action
FEE.....	Foundation for Environmental Education
WASWC.....	World Association for Soil, Land and Water
MAP.....	Mangrove Action Project
PCLG.....	Poverty and Conservation Learning Group facilitated
IIED.....	International Institute for Environment and Development
DDR.....	Disaster Risk Reduction

1. Introduction

Bangladesh has been experiencing more frequent and intense natural disasters since last two decades. Its southern frontier is one of the most vulnerable regions of the world, which is exposed to many damaging weather events as an effect of climate change and consequent devastation of nature. The recent super cyclonic SIDR, on 15 November 2007, which caused human loss of about 5,000 and made the survivors homeless (Bangladesh Forest Department).

The Government of Bangladesh (GoB) and various Non-government Organizations (NGOs) have advanced for the development of the SIDR affected people with national and international funding. The Millennium Development Goals (MDGs) are eight goals to be achieved by 2015 that respond to the world's main development challenges. The eight MDGs break down into 21 quantifiable targets that are measured by 60 indicators. The goals are: Eradicate extreme poverty and hunger; Achieve universal primary education; Promote gender equality and empower women; Reduce child mortality; Improve maternal health; Combat HIV/AIDS, malaria and other diseases; Ensure environmental sustainability and Develop a Global Partnership for Development.

To evaluate the relief and post disaster support, the Paris Declaration on Aid Effectiveness, endorsed in March 2005, is now recognized as a landmark international agreement aimed at improving the quality of aid and its impact on development. It lays out a road-map of practical commitments, organized around five key principles of effective aid: Ownership by countries; Alignment with countries' strategies, systems and procedures; Harmonization of donors' actions; Managing for results, and Mutual accountability.

The Hyogo Framework for Action (HFA) of Disaster Reduction convened in Kobe, Japan in 2005 identified five priorities in its action plan. They are i) Ensure that disaster risk reduction is a national and a local priority with a strong institutional basis for implementation; ii) Identify, assess and monitor disaster risks and enhance early warning; iii) Use knowledge, innovation and education to build a culture of safety and resilience at all levels; iv) Reduce the underlying risk factors and v) Strengthen disaster preparedness for effective response at all levels. According to the Millennium Development Goals (MDGs), the Paris Declaration and the Hyogo Framework for Action (HFA) of Disaster Reduction the objectives of Centre for Coastal Environmental Conservation (CCEC) have evaluated. Specific objective of the Project, entitled "Rehabilitation of SIDR Affected Sundarbans Stakeholders" is to rehabilitate of the SIDR impacted Sundarbans stakeholders.

1.1. Sundarbans in Brief

The Sundarbans, the world's largest natural mangrove ecosystem, is located in the southwestern part of Bangladesh bordering the Bay of Bengal. It covers a total area of about 600,400 ha (Runkel and Ahmad, 1997). Three wildlife sanctuaries, in the Sundarbans, covering an area of 139,700 ha has declared as world heritage site (798th) by the UNESCO (United Nations Education Scientific and Cultural Organization) in 1997. The entire Sundarban has been declared as 560th Ramsar Site in 1992 due to covering all criteria of wetland as well as Ramsar Site.

The Sundarbans supports very rich and diverse flora (334 species) and fauna (269 species). It plays an important role in the local and national economy. Ecologically, this forest reserve is particularly important for the region as it acts as a barrier against damages by cyclones and tidal surges.

Some 300,000 people depend directly or indirectly on its resources for their livelihood (Canonizado and Hossain, 1998). The forest is an environmental shield for the people living in the country's southwestern region. The rivers in the estuary of the Sundarbans hold more than 200 species of fish including Hilsha, Fatty Catfish, Bass, White Grunt, Eel Tail Catfish, Indian Salmon, Crocker, Scats, Mulletts, Ribbon Fish, Bombay duck, Anchovys etc. Besides these, rivers are the sanctuary of various types of shrimps like tiger shrimps, giant fresh water prawn, Indian white shrimp, green tiger shrimp, brown shrimp etc.

In the last two decades, Bangladesh has experienced cyclones of increased frequency and severity, probably due to global climate change. In the same way, the Sundarbans has been increasingly threatened in recent years by intense human interventions and natural hazards.

1.2. Effects on the Sundarbans by SIDR

1.2.1. Effects on infrastructures and watercrafts

Cyclone SIDR caused devastation of existing infrastructures within the Sundarbans of the Forest Department. Administrative offices namely Range, Station, Patrol posts and forest camps are severely damaged. Almost all the offices in the eastern part of the Sundarbans as well as the personal belongings of the staff members have been damaged. Thirty-two communication towers are damaged severely and consequently communication is disrupted. Important office documents have been washed off. This has created an immense loss to the government property. Immediate action was needed to re-establish the functionary of the field activities. Fifty-nine watercrafts belong to the eastern part of the Sundarbans has been destroyed. This has hampered the mobility of the forest staff staying in the remote areas of the Sundarbans.

1.2.2. Effect on flora

The natural vegetation of the Sundarbans is composed mainly of halophytic tree species. The eastern part is mainly dominated by Sundri and Gewa, which were severely affected by the cyclone SIDR. It was estimated that around 1,900 sq. km. (31% of total the Sundarbans area) of area in the eastern part of the Sundarbans was affected by the cyclone.

1.2.3. Effect on fauna

The flora and fauna of the Sundarbans became a major casualty of the devastating cyclone. According to experts, 40 species of mammals, some 400 species of birds and more than 200 species of fishes became victim to the calamity- one of the worst in recent memory (www.bangladeshonline.com).

The Sundarbans is the home of the Royal Bengal Tigers, already an endangered animal. The Forest Department is yet to make an assessment of the colossal losses of wildlife in the Sundarbans.

1.2.4. Effects on Eco-tourism

In the recent past the Sundarbans attracted huge number of both local and foreign tourists. Private tour operators have also developed their infrastructures and facilities to accommodate extensive tours inside the Sundarbans. Meanwhile the local tour operators, with the assistance of the Forest Department, have developed a systematic and structured tour system. Due to this cyclone existing facilities in the Sundarbans has been completely damaged. This caused a huge loss in this sector.

Sl.	Physical Damage	Amount (lac Taka)
a.	Damage of Forest Resources	100,000.00
a.1	Heavily damaged forest 30,000 ha	
a.2	Partial damage of forest 80,000 ha	
	<i>sub-total</i>	100,000.00
b.	Infrastructure (completely damaged)	
b.1	Office and Residents - 126 nos.	900.00
b.2	Water Vessels - 50 nos.	198.84
b.3	Jetty and Poltoon - 59 nos.	146.32
b.4	Wireless tower, RT sets and Base set - 32 nos.	166.60
	<i>sub-total</i>	1,411.76
c.	Infrastructure (partially damaged)	
c.1	Office and Residents - 93 nos.	127.03
c.2	Water Vessels - 9 nos.	60.87
c.3	Jetty and Poltoon - 12 nos.	6.76
c.4	Others	393.58
	<i>sub-total</i>	588.24
	Grand total	102,000.00

Source: Bangladesh Forest Department, 2008.

1.3. Acts and Conventions for the Protection and Conservation of Wildlife and Biodiversity

Bangladesh has signed, ratified, accepted and acceded to CITES, World Heritage Convention, Ramsar Convention, CBD, Climate Change Convention and Convention to Combat Desertification. Thus it adheres and commit to the conservation of biodiversity and the environment.

1.3.1. The Bangladesh Wildlife (Preservation) (Amendment) Act, 1974

The 1974 Wildlife Act consolidates and improves the older legal provisions to conserve the wildlife in Bangladesh. The Forest Department has the primary responsibility for implementing the Act. The Act allows the government to declare any land to be a wildlife sanctuary, a national park, or a game reserve. Bangladesh currently has fourteen Protected Areas (nine wildlife sanctuaries, four national parks, and a single game reserve). The Act, however, does not contain any provision for establishing and managing buffer zones. Under current social, economic and institutional conditions the forest department faces many problems in enforcing different provisions of this act.

1.3.2. Convention on Biological Diversity

Bangladesh is rich in biodiversity. The country has about 113 species of mammals, over 630 species of birds, 125 species of reptiles and 22 species of amphibians. It has 260 freshwater species and 475 marine species. As far available information, other faunal species include 327 mollusks and 66 corals. Status of insect species is not available but it is reported to be highly diverse.

Since signing and ratification of the CBD respectively in 1992 and 1994, the status of implementation of CBD in Bangladesh can be measured on the following activities as outlined against the concerned issue and Article of the CBD below:

Article – 6 (Strategies, Plans and Programmes)

Contracting parties shall develop national strategies, plans or programmes for the conservation of biological diversity.

Article – 7 (Identification and Monitoring)

This Article is about the ordering and use of information on biological diversity and biological resources for the purposes of Articles 8 – 10.

Article – 8 (In situ Conservation)

This Article provides the main set of convention obligations to conserve biological diversity

Article – 9 (Ex situ Conservation)

This Article provides for measures to be adopted by the CPs for conservation of biodiversity in ex situ condition.

Article – 10 (Sustainable use of components of biological diversity)

Under this Article the CPs shall integrate consideration of the conservation and sustainable use of biological resources into national decisions making.

Article – 11 (Incentive measures)

This Article has provision for adoption of economically and socially sound measures that act as incentives for the conservation and sustainable use of components of biological diversity.

Article – 12 (Research and Training)

Under this Article the contracting parties shall have to establish and maintain programs for scientific and technical education and training for identification, conservation and sustainable use of biological diversity.

Article – 13 (Public education and awareness)

This Article has the mandate to promote and encourage understanding of the importance of biodiversity.

Article – 14 (Impact Assessment and minimizing adverse impacts)

Article – 15 (Access to genetic resources)

2. Scope of the Evaluation

The scope of the evaluation of the project has given below:

- This evaluation of the concerning project will assist to identify the performance of CCEC.
- It will also provide the exact direction for managing the limitations of CCEC activities in the context of this project and how it will overcome.
- To comprehend the necessity the bottom up approach in association of local communities.
- The knowledge of this evaluation will help the proper arrangement of such kind of project in future.
- This evaluation will provide the proper guideline of sustainable natural resource extraction from the Sundarbans.
- In addition, this evaluation will support for sustainable livelihood pattern of the stakeholders.
- This evaluation will help policy development for sustainable livelihood improvement of rural people.

3. The Area of Project Implementation

The area was 24 villages of 6 Unions in Shyamnagar Upazila under Satkhira District of Bangladesh. A summary of the cyclone SIDR on this Upazila is enlisted in the table-2.

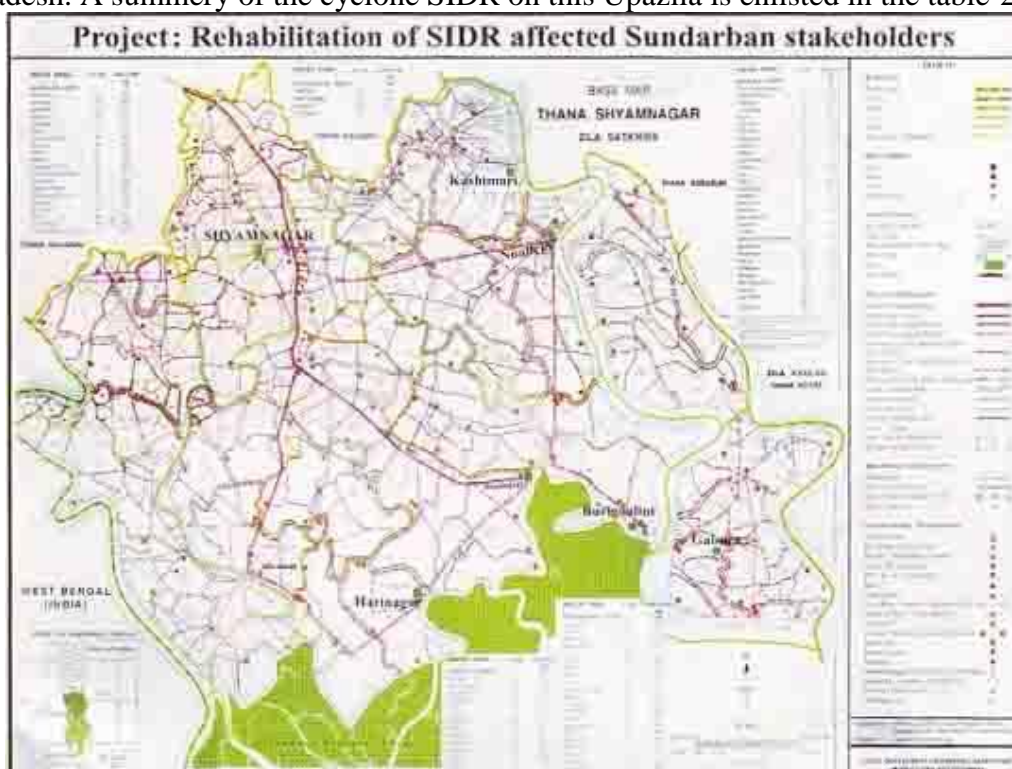


Figure-1: The map of the project implemented area- Shyamnagar Upazila.

Table-2: Effects of SIDR in Shyamnagar Upazila.

SL	Accounts of Damage	Amount of damage
01.	Total area damaged	45700 sq. km.
02.	Total union damaged	12
03.	Death of people (according to the collected data)	10 (02-by boat sinking, 08-by storm). Funeral of this 10 dead people is done.
04.	Affected family	15,000
05.	Affected people	72,250
06.	Wounded people	122
07.	Damaged cultivated agricultural land	10,388.00 acre Damage in terms of money- 2, 31, 0000.00 Tk.
08.	Damaged houses (Full)	3500
09.	Damaged houses (Partial)	6,500
10.	Damaged educational institute (Full)	34
11.	Damaged educational institute (Partial)	16
12.	Damage in fishery	
13.	Damage in livestock	a) Domestic animal 16=50,600.00Tk. b) Duck-Hen-141= 14,100 Tk.
14.	Damaged embankment (Full)	0.150 km.
15.	Damaged embankment (Partial)	12,000 km.
16.	Damaged katcha road	15,000 km.

Source: Shyamnagar Upazila Office, 2008.

4. Principal objectives of CCEC

- Sustainable livelihood security of the SIDR affected the Sundarbans Stakeholders.
- Reduce Risks associated with threats from Natural Disasters and Climate Change.
- Sensitize coastal communities on sustainable the Sundarbans conservation and its use.
- Raising public awareness through mangrove regeneration, biodiversity conservation and campaigns.

5. Overall Activities of the Project “Rehabilitation of SIDR Affected Sundarbans Stakeholders”

Centre for Coastal Environmental Conservation (CCEC) is a non-profit grass roots environmental NGO for the protection and sustainable management of coastal ecosystems in Bangladesh through local initiatives and participation. The aim of the organization is to mobilize local communities in achieving long-term sustainability for natural resources through environmental awareness and action as an adaptation to global climate change. The CCEC is registered by the Foreign Donation (Voluntary Activities) Regulation Rules 1978 under the NGO Affairs Bureau, Government of Bangladesh, is a member of IUCN and first member of the Foundation for Environmental Education (FEE) from Asia.

From 1993 the CCEC is working on biodiversity conservation of the Sundarbans, protection of the mangroves ecosystems, environmental education, livelihood security of the coastal communities, Disaster Risk Reduction (DDR), tidal surge, Climate Change Adaptation and Mitigation (ADMIT), research and various programs on self-dependence such as community based tree plantation and so on.

CCEC is a member and partner of various international agencies such as; The World Conservation Union (IUCN), Foundation for Environmental Education (FEE), World Association for Soil, Land and Water (WASWC), Mangrove Action Project (MAP) and Poverty and Conservation Learning Group (PCLG) facilitated by the International Institute for Environment and Development (IIED).

After the cyclone SIDR disaster, CCEC devoted part of its activities to the rehabilitation of the Sundarbans west area affected by the cyclone and to support its hard-core poor stakeholder population.

The Project named “Rehabilitation of the SIDR Affected Sundarbans Stakeholders” has been implemented by the CCEC in collaboration with WWF Italia funded by AGIRE.

5.1. Short-term activities

- Emergency Food Aid (rice, pulse, fried rice, molasses)
At the initial stage, three hundred (300) vulnerable stakeholders were interviewed and among those one hundred fifty (150) stakeholders were selected who were severely affected by the cyclone SIDR. The selection committee was composed of by the project staff, local authorities and beneficiaries’ representatives. After the cyclone the stakeholders were primarily provided emergency relief consisting of¹:
 - Rice-10Kg
 - Pulses-2Kg
 - Molasses - 2Kg
 - Fried rice- 1Kg
 - Salt
 - Saline
- Other items
 - Match -2 Dozens
 - Shari
 - Gamcha
 - Lungi
 - Polyethylene
 - Hurricane
 - Quilt
- Shelter
Post emergency /construction. Semi permanent shelter was provided by CCEC. These are given below:
 - After SIDR 50- Shelter / Houses construction was provided among the stakeholders whose houses were destroyed.
 - Mosque -1 and Temple were constructed also.

¹ **Source:** The Dainik Drishtripat, April 24, 2008; the Dainik Juger Barta, April 24, 2008; the Dainik Patrodutt, April 24, 2008; the Dainik Kafela, April 25, 2008.



Figure-2: The shelter sample (house) was provided by CCEC

- Net, Boat, Gear
 - By realizing the fisherman's dependency on fishing activity, twenty selected fisherman were conferred "Net, Boat, Gear" support, which were²:
 - Boat- 1(Length 24 feet)
 - Paddle-1Piece
 - Large rope-1Kg
 - Stick of small net- 1.6 Kg
 - Stick of net- 4 Kg
 - Chimney- 1 piece (For catching Crab)
 - Graphee- 1 Piece
 - Patagal-1 Piece
 - Cover of boat- 1Piece
 - Thick polythene- 5 Gauge
 - Lantern- 1 piece
- BLC (Boat License Certificate)
 - 150- BLC support among Bouali, Mouali, Jalley (FISH) and Jalley (CRAB) stakeholders.
- Embankment Repair/Maintenance
 - Repair and Maintenance of Jatintranagar sluice gate embankment (Ring badh) under polder 5.

² **Source:** The Dainik Drishtripat, April 24, 2008, The Dainik Patrodutt, April 24, 2008, The Dainik Kafela, April 25, 2008, The Dainik Janota, April 26, 2008.



Figure-3: Embankment repair by CCEC

5.2. Long-term activities

▪ SME (Small and Medium Enterprise No.4)

To ensure the long—term rehabilitation of livelihoods of the Sundarbans stakeholders, Small and Medium Entrepreneurs (SME) was formed. These were represented by the demographic make up of the community and included:

- 25 fishermen (FISH/SHRIMP harvester)
- 75 fishermen (CRAB harvester)
- 25 Bouali (thatch cutter)
- 25 Mouali (honey extractor)

Several Small and Medium Enterprises (SME) or business industries were developed by involving 150 the Sundarbans SIDR affected stakeholders. These included:

- Bouali Enterprise,
- Mouali Enterprise,
- Jalley (FISH) Enterprise.
- Jalley (CRAB) Enterprise
- Crab Fattening
- Sundarban Handicraft- Gopalpur village



Figure-4: Bouali Enterprise of the Sundarbans stakeholders.



Figure-6: The Mouali Enterprise of the Sundarbans stakeholders.



Figure-7: The Jellay Enterprise (Crab) of the Sundarbans stakeholders.



Figure-8: The Jellay Enterprise (Fish) of the Sundarbans stakeholders

- Mangroves Regeneration and Plantation
Member 600 (including 15 Munda families, Group 30, Village 12)
Mangrove Nursery, Plantation and Training
Activities of the Conservation and Re-generation process:

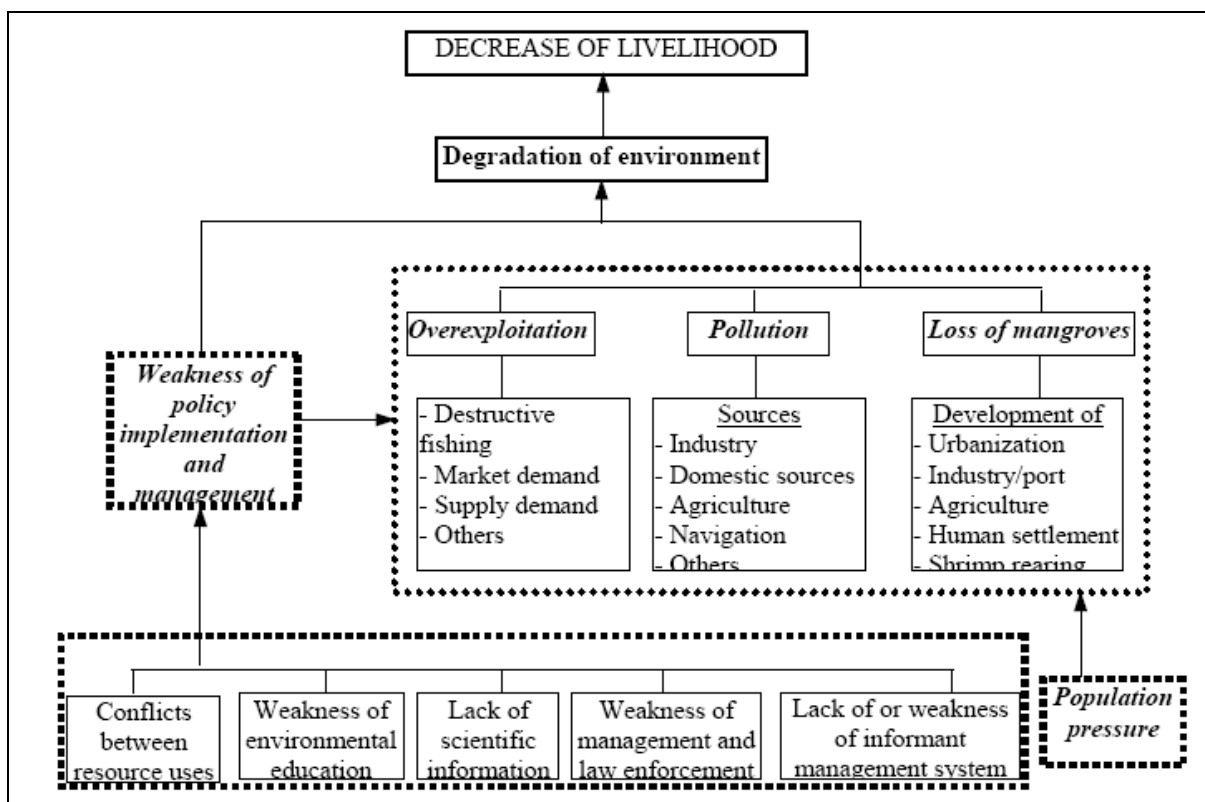


Figure-9: The flow diagram of dependency of Human, Animals and Plants on the Sundarbans



Figure-10: Mangroves Regeneration and Plantation activities of CCEC



Figure-11: Mangroves Regeneration and Plantation activities of CCEC



Figure-12: Mangroves Regeneration and Plantation activities of CCEC

The CCEC has signed a Memorandum of Understanding (MOU) with Bangladesh Water Development Board (BWDB) and launched nurseries, seed collection, and plantation, embankment repair, restoration and rehabilitation of mangrove diversity with technical

assistance from Mangrove Silviculture Khulna Division of Bangladesh Forest Research Institute

The collaboration with Bangladesh Water Development Board (BWDB) and Mangrove Protection Society (MPS) were assured the restoration of an area of mangrove forest affected by the cyclone and ensure measures are taken against riverbank erosion.

- Disaster Management Committee (DMC) meeting

Reducing the risks associated with threats from natural disasters and climate change. The project has connected the programme with the emergency response, disaster preparedness and coping strategies to the Upazilla level Disaster Management Committee (DMC) chaired by the Upazilla Nirbahi Officer (UNO) and Union level DMC chaired by the UP Chairman and the systems already in existence within the local government systems of Bangladesh.

- FD (Forest Department) counseling

Counseling with Forest Department was set for capacity building of the Sundarbans stakeholders, sustainable harvesting of the Sundarbans resources above all long-term sustainability of the Sundarbans Reserved Forest (SRF). Reducing the risk of the piracy and kidnapping, communication was to maintain between the FD and Coast Guard to ensure the safety of both the stakeholder community and the resources on which they rely. A community-based approach was developed for the benefit of the stakeholders and bridging the gap between the Sundarbans management authority (FD) and the stakeholders.

The stakeholders in cooperation conducted the awareness activities with FD contributing to the conservation and the reduction of future ecological disasters.

- NGO Networking for disaster preparedness and mitigation

CCEC have conducted NGOs networking for disaster preparedness and mitigation with 14 NGOs, 73 groups and consisting 2217 beneficiaries.

Name of the NGOs

1. Jagorani Chakro Foundation, 2. Progati Shamaj Unnaon Shangstha, 3. Nakshi Katha 4. Shushilan, 5. Sudipti, 6. Uttaran, 7. Shetu Bangladesh, 8. Leaders, 9. Barcik, 10. Barsha, 11. Rupantar, 12. Gharoni, 13. Noabeki Ganornukhi Foundation, 14. Eshoripur Development Foundation, 15. Grameen Bank, 16. BRAC, 17. Asa, 18. Palli Daridro Birnochon Foundation, 19. Caritas, 20. ManobUnnaon Sangstha, 21. Dera and 22. Bridge.

Name of the disaster management committee:

1. Upazilla Disaster Management Committee,
2. Burigoalini Disaster Management Committee,
3. Kashimari Disaster Management Committee,
4. Atulia Disaster Management Committee,
5. Gabura Disaster Management Committee and
6. Munshiganj Disaster Management Committee

- Awareness Raising Activities of CCEC

Public Campaign Awareness through cultural songs using POT

Development of the Sundarbans awareness POT song involving SHUDIPTI, a local cultural NGO for creating the Sundarbans conscious citizen and reducing the extent of natural disaster damage.



Figure-13: Public campaign awareness of CCEC by “T-Shirt”.

Public campaign awareness on the protection of coastal riverbank mangroves thicket and the conservation of its associated biodiversity, the organization has taken co-management initiative with the formation of Mangrove Protection Society (MPS), observation of World Environment Day, Mangrove Action Day of Shyamnagar, Satkhira district in collaboration with local administration.

Environmental Awareness Education in Schools

The organization has developed an Environmental Education (EE) package consists of teachers Manual, students Booklet and Poster and trained 800 primary and secondary school teachers of Khulna, Bagerhat and Satkhira coastal districts of the Sundarbans region in cooperation with Directorate of Primary Education and Khulna University using the Education Extension package focusing the Sundarbans conservation. Making the students environmentally aware and for the existence of future generation, the teacher plays a vital role by transmitting the acquired knowledge and providing information on the current state of the environment. CCEC has campaigned 85 schools and 3562 students but initially its target was 3000 students. Besides these, 1000 poor students of 10 schools had been provided notebook, pen, and eraser by CCEC.

Children’s Art Competition

Children’s Art Competition was held on 26, July 2008 to aware the children about the importance of the mangrove forest. One of these drawings was selected for award by Mangrove Action Project, USA and it will be printed in 2009 calendar.

The Sundarbans Handicrafts

“The Sundarbans Handicrafts” program for making and selling tourist products such as t-shirt, school bag, visitor’s bag, mobile cover, wall mat with conservation messages with wildlife logo, crocodile and tiger statue prepared with Sundarbans honey-wax and other souvenir by involving local minority communities empowering women were key to poverty reduction strategies. The Sundarbans Handicraft Items explore the importance of the Sundarbans mangrove forest. The items are as follows:

Table-3: List of the items of the Sundarbans Handicrafts

SL.No.	Items	Price (Tk.)
01	School bag	120
02	Tourist bag	80
03	Ladies bag	100
04	Mobile bag (Portrait of tiger and Deer)	70
05	Sundarbans album	120
06	Portrait of Sundarbans wildlife on the napkin	100
07	T-shirt with collar (Portrait of tiger)	80
08	T-shirt (Portrait of Tiger)	60
09	Wall mat (Portrait of Tiger & Deer portrait on gunny)-big size	200
10	Wall mat-(Tiger and Deer portrait on gunny)-small size	150
11	Wall mat (Portrait of Tiger & Deer portrait on gunny)-big -frame	300
12	Wall mat-(Tiger and Deer portrait on gunny)-small frame	230
13	Wall mat (Tiger & Deer portrait on cloth)-big size	220
14	Wall mat (Tiger & Deer portrait on cloth)-small size	160
15	Wall mat (Tiger & Deer portrait on cloth)-big –frame	320
16	Wall mat (Tiger & Deer portrait on cloth)-small -frame	240
17	Hand fan(Tiger & Deer portrait on cloth)	80
18	Tiger, Deer, Sundarbans map & other Sundarbans wildlife portrait on winnowing platter or tray (Kulla)-big size	100
19	Tiger, Deer, Sundarbans map & other Sundarbans wildlife portrait on winnowing platter or tray (Kulla)-small size	80
20	Tiger, Deer, Sundarbans map & other Sundarbans wildlife portrait on sieve (Chalan)	100
21	Tiger, Deer, Sundarbans map & other Sundarbans wildlife portrait on sieve (Chalan)	80
22	Pillow cover	160
23	Fate of mangrove leaf	180
24	Tiger portrait by the Sundarbans honey wax	60
25	Deer portrait by the Sundarbans honey wax	60
26	Crocodile portrait by the Sundarbans honey wax	50
27	Turtle portrait by the Sundarbans honey wax	40
28	Sundarbans pure honey	300
29	The Sundarbans Introductory	5

Coordination with the FD

Coordination with the FD especially for communicating sustainable Sundarbans conservation messages using posters, leaflets and other materials will strengthen the FD as a motivational

centre for communicating conservation ethics into the large number of the Sundarbans stakeholder communities.

The Stakeholders were awarded for the conservation of biodiversity supported by spreading sustainable practices such as:

- No central leaf cutting of thatch material
- No killing of monitor lizards as crab bait,
- No firing into entire honey-hive,
- No chemical use for making fish hyperactive.

▪ Other activities:

Legal Aid: Initiative on Legal Aid support for the Sundarbans stakeholders is coordination with 'Bangladesh Environmental Lawyer's Association (BELA) and Bangladesh Legal Aid and Services Trust (BLAST).

MOU: A Memorandum of Understanding (MOU) is signed between CCEC and the Bangladesh Water Development Board (BWDB). Another Memorandum of Understanding (MOU) is in force between CCEC and Centre on Integrated Studies of the Sundarbans (CISS), Khulna University and a further MoU between (BWDB).

▪ Special support

A member of the Sundarbans stakeholder cooperative society named Monu Molla, who was killed by the second time attacking of the Royal Bengal Tiger. His family has been given a van to maintain their livelihood and a house for their shelter.



Figure-14: Co-operative society of different enterprise

6. Methodology

The study has been conducted in the Shyamnagar Upazila, Satkhira district after one year of Cyclone SIDR. An evaluation of the project of Rehabilitation of SIDR affected Sundarban Stakeholders was done which arranged by Center for Coastal Environmental Conservation (CCEC). The estimation has made by collecting the data from the affected people of that Upazilla. Data has been collected through man-to-man questionnaire survey from the Sundarbans stakeholders. This assessment study is based on the following information:

- i. Basic data from the stakeholders;
- ii. The data of damage from secondary sources;
- iii. Awareness and relief data from NGOs and directly from communities;
- iv. Mangrove protection and conservation data from local communities which are involved in that activities;

- v. The data of future natural disaster management activities from elite group of different locality and directly from communities;
- vi. Shrimp and crab cultivation statistics data from local communities;
- vii. Sustainability, gender equity and women empowerment information;
- viii. The statistics of depth of the river bed is reduced due to siltation;
- ix. The data of injustice by moneylender (“mahajan”) of the stakeholders of the Sundarbans
- x. The information is that Munshigang, Shyamnagar, Satkhira is the most accessible eco-tourism spot by road way is collected by local people and NGOs;

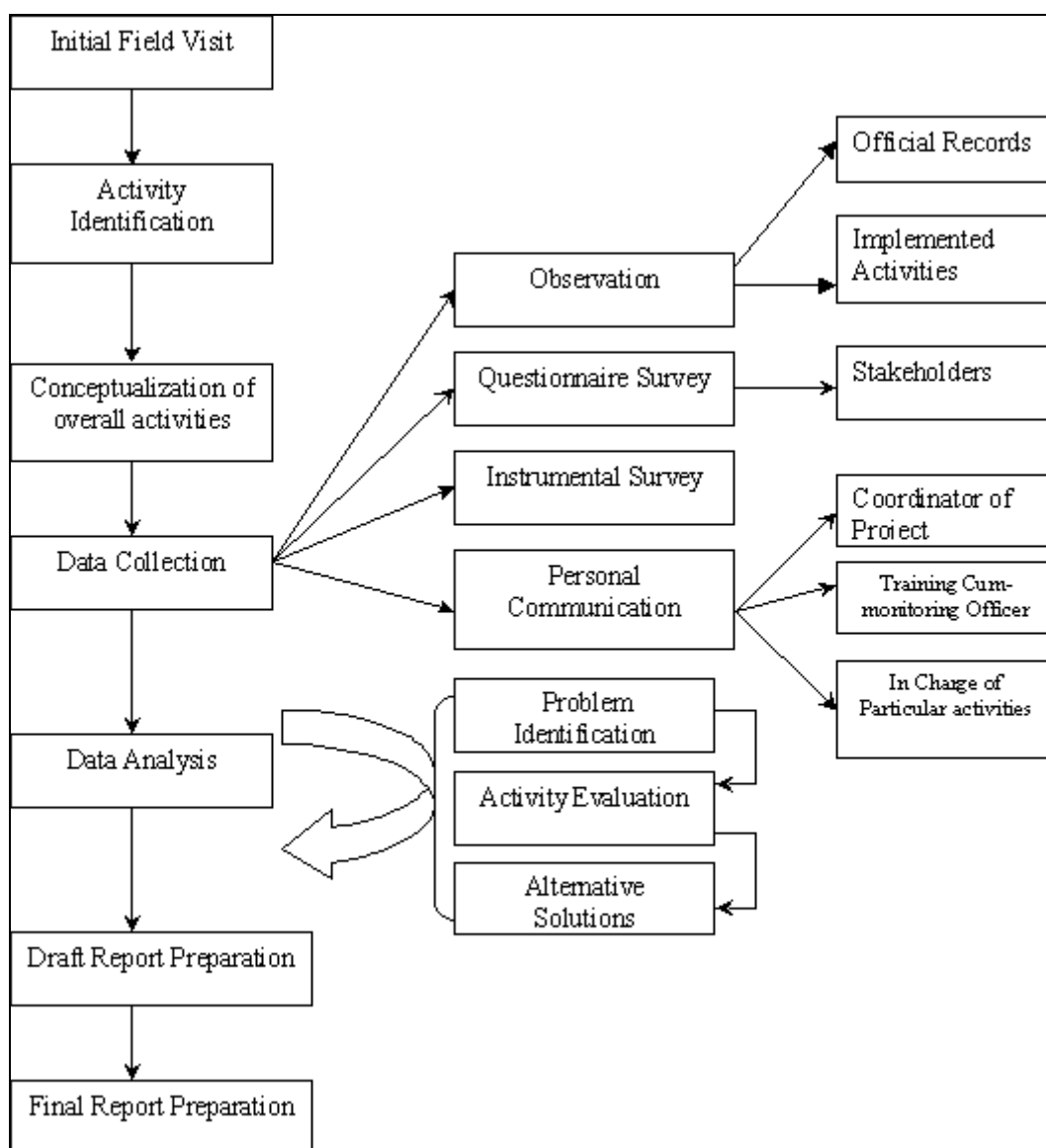


Figure-15: Overall flow chart of preparing the ER of CCEC activities.

7. Evaluation of the project

CCEC started the project from 1st February, 2008. At first CCEC collected the data about the destruction of cyclone SIDR from Forest Department (FD), Government Organizations (GOs) and Non-government Organizations (NGOs). Then it conducted field visit and

performed a questionnaire survey in 24 villages of 6 unions in Shyamnagar Upazila to identify stakeholders who were most severely affected by the cyclone SIDR. While identifying the stakeholders, it had given emphasis on some criteria:

- The people who were fully dependent on the Sundarbans for their livelihood
- Who were actually suffered by the SIDR.
- The people who were deprived from relief.

At the initial stage they identified 300 people and finally 150 stakeholders were selected as project beneficiary.

The survey was done among the 150 stakeholders by taking 50 under random sampling process. The performance of the activities has calculated by considering four indicators.

- Appropriateness,
- Relevance,
- Effectiveness,
- Efficiency,
- Transparency and
- Peoples perception

Each of the indicators was given the value of 16.67 as the overall performance was considered within 100 percent (%)

Activity	Performance of the Activity
Emergency Food Aid	98.55%
Awareness	98.55%
Small and Medium Enterprise – cooperative society	98.01%
Shelter	100%
NGO Networking	100%
FD (Forest Department) counseling	85.74%
Mangroves Regeneration and Plantation	100%
Disaster Management Committee (DMC)	91.67%
Net, Boat, Gear support	91.67%
Embankment Repair/Maintenance	100%
BLC (Boat License Certificate)	100%

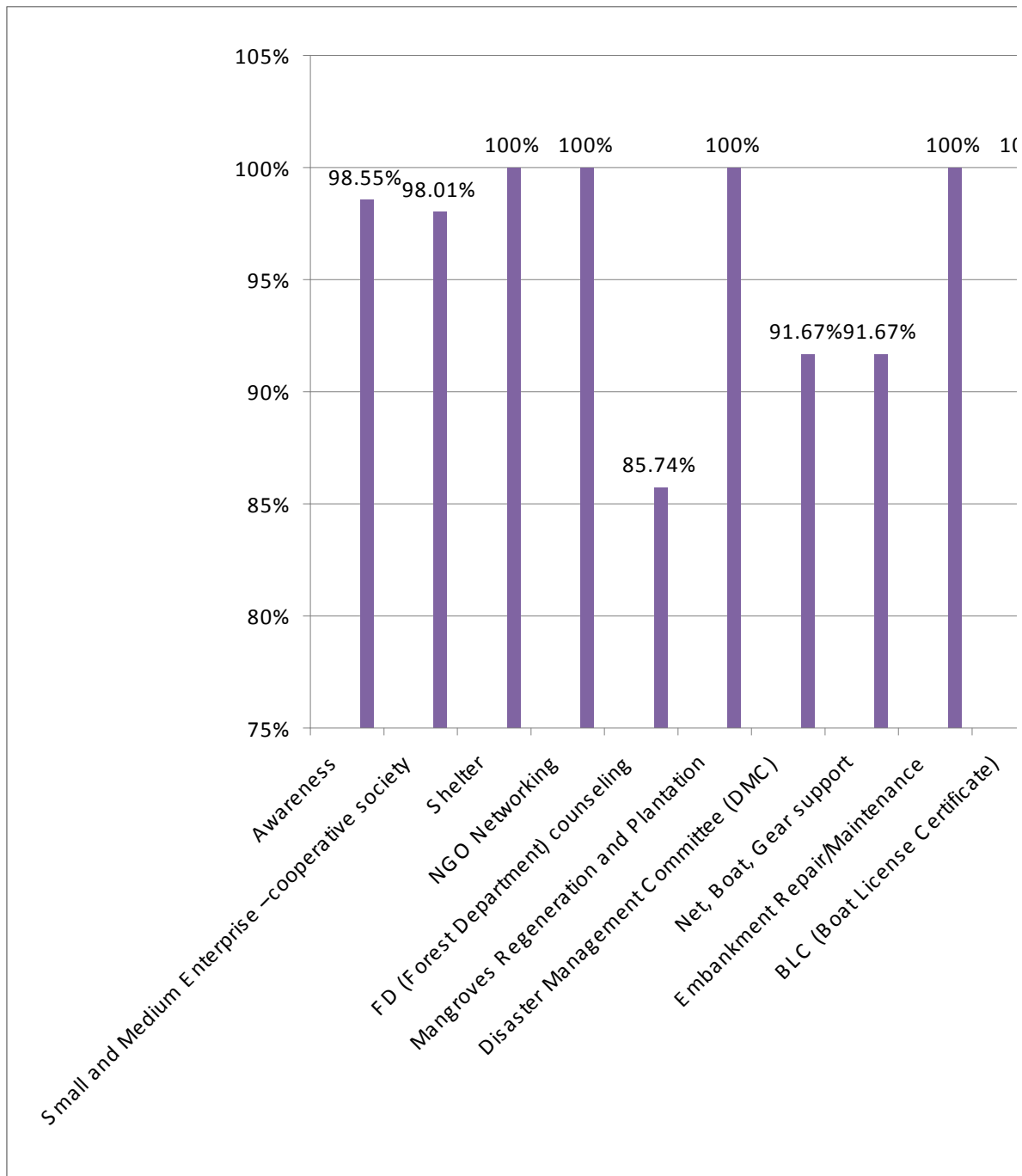


Figure-16: Bar graph of the performance of various activities of CCEC.

Emergency Food Aid

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness----- 11.11 %
- Efficiency -----16.67%
- Peoples perception-----16.67%

*Effectiveness--11.11, because there was no supply of fresh water, fuel for cooking and water purifying tablet.

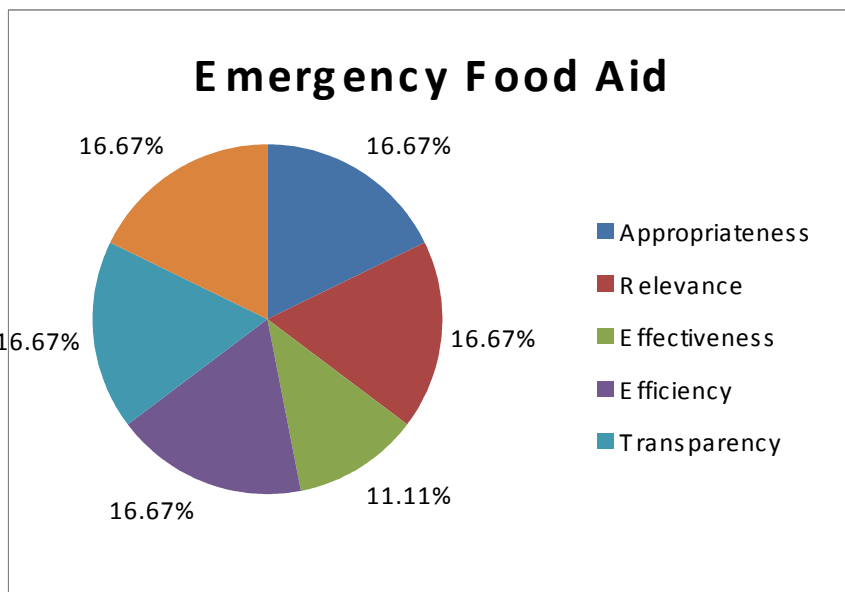


Figure-17: Pie-diagram of Emergency Food Aid

Awareness

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency----- 15.22%*
- Transparency -----16.67%
- Peoples perception-----16.67%

*Efficiency 15.22, because all the 150 stakeholders were not participated in awareness raising activities.

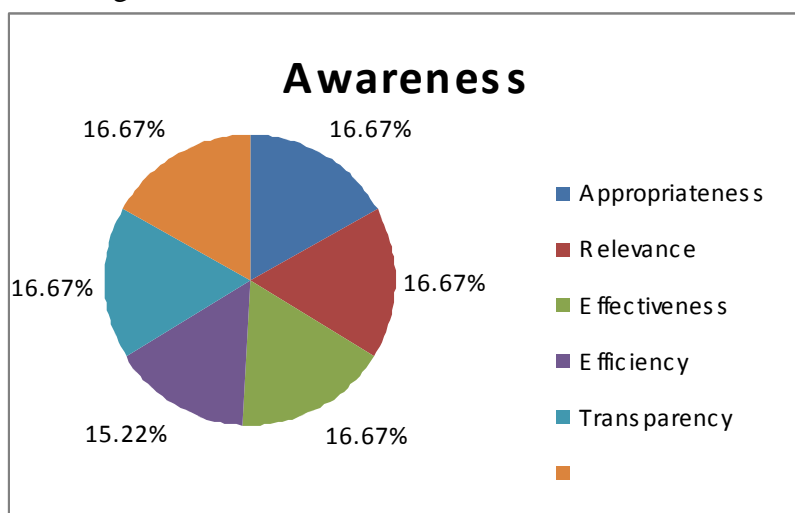


Figure-18: Pie-diagram of awareness

Small and Medium Enterprise –Cooperative Society

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency-----14.70%*
- Transparency-----16.67%
- Peoples perception----16.67%

*Efficiency 14.70, because the stakeholders of Fisherman (Crab& Fish) lend money from the moneylenders (Mahajans) and the price of the products from “Sundarban Handicraft Enterprise” is relatively high.

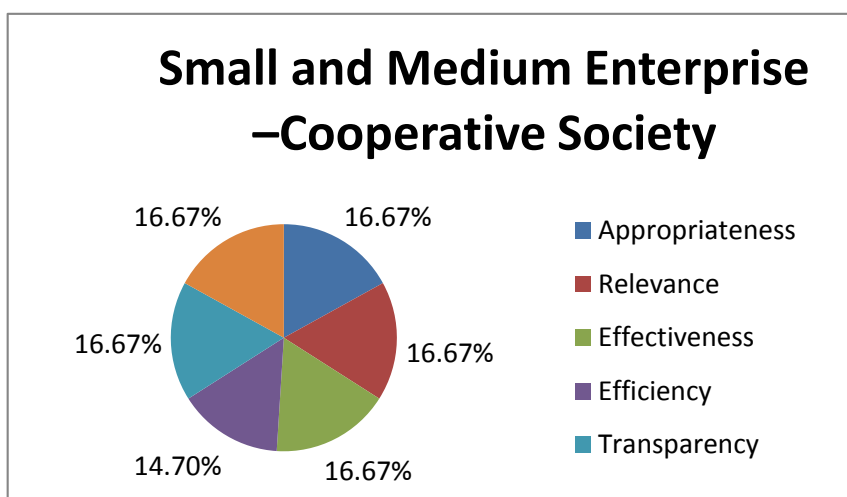


Figure-19: Pie-diagram of Small and Medium Enterprise –Cooperative Society Shelter:

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency-----16.67%
- Transparency-----16.67%
- Peoples perception--16.67%

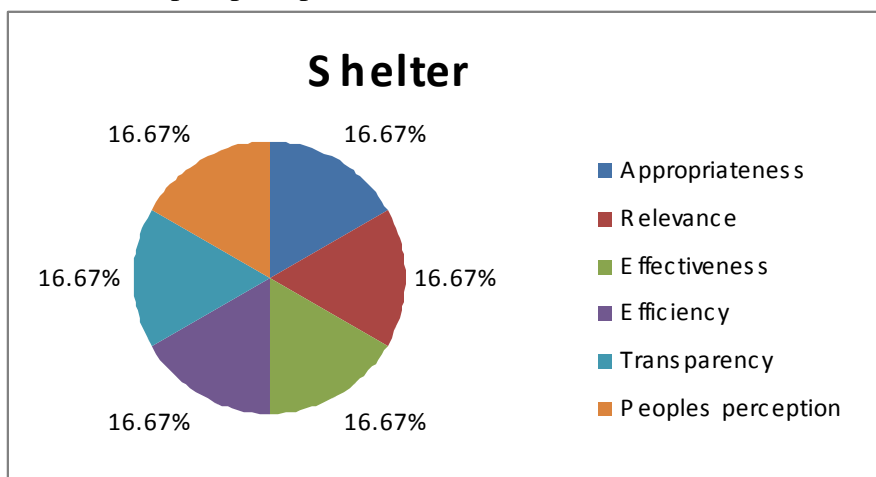


Figure-20: Pie-diagram of Shelter

NGO Networking:

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency-----16.67%
- Transparency-----16.67%
- Peoples perception--16.67%

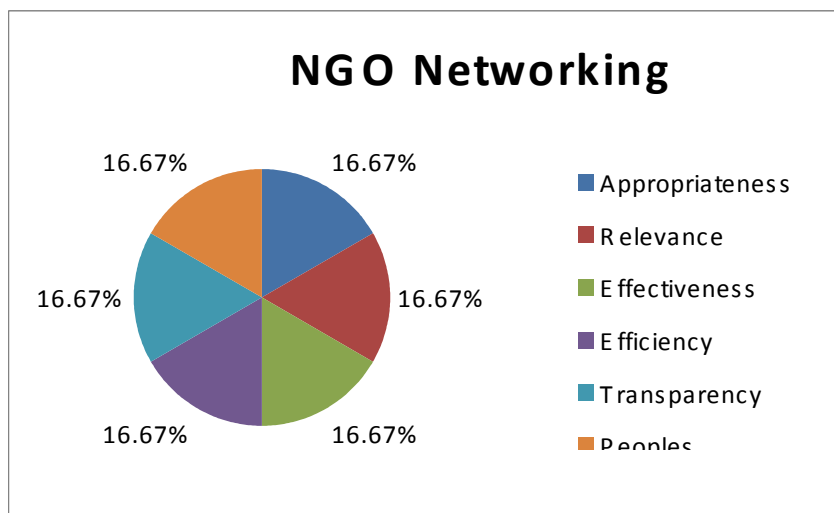


Figure-21: Pie-diagram of NGO Networking

FD (Forest Department) Counseling

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness-----11.91%*
- Efficiency-----11.91%*
- Transparency-----16.67%
- Peoples perception---11.91%*

*Effectiveness 11.91, *Efficiency 11.91, *Peoples perception 11.91 because the Forest Department is slightly corrupted in BLC and people want to be free from Kidnapping by the pirates and robbers.

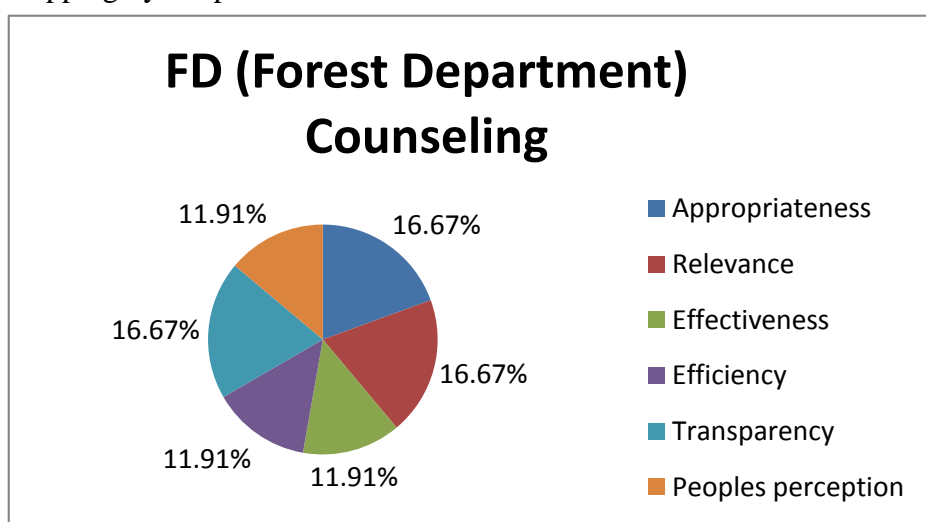


Figure-22: Pie-diagram of FD (Forest Department) Counseling

Mangroves Regeneration and Plantation

- Appropriateness----16.67%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency-----16.67%
- Transparency-----16.67%
- Peoples perception--16.67%

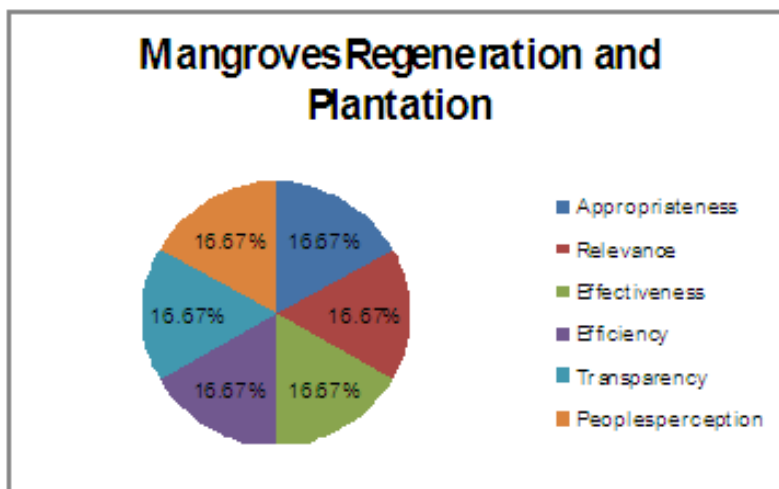


Figure-23: Pie-diagram of Mangroves Regeneration and Plantation

Disaster Management Committee (DMC)

- Appropriateness----16.67%
- Relevance-----16.67%
- Effectiveness-----12.50% *
- Efficiency-----12.50% *
- Transparency-----16.67%
- Peoples perception--16.67%

*Effectiveness 12.50%, *Efficiency 12.50%, because the stakeholders have not yet built houses in elevated place.

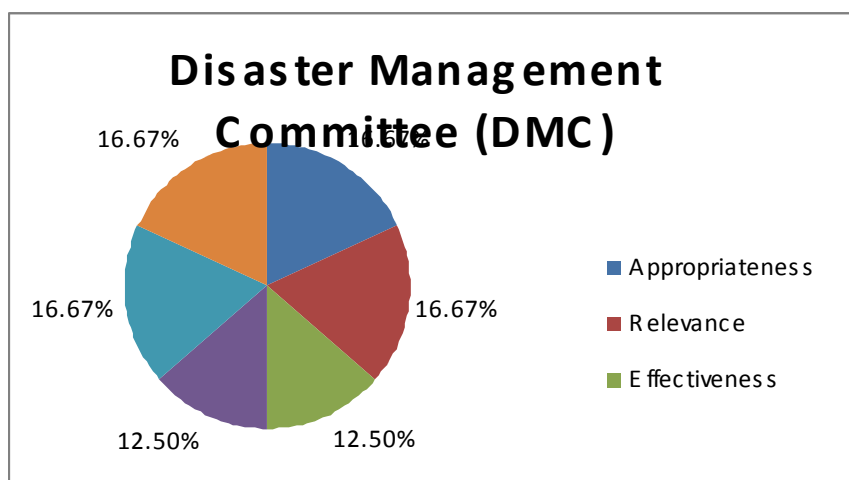


Figure-24: Pie-diagram of Disaster Management Committee (DMC)

Net, Boat, Gear support:

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency-----12.50%*
- Transparency-----16.67%
- Peoples perception---12.50%*

*Efficiency 12.50%,*Peoples perception 12.50%, because during preparing boat, the “Bottom up approach³ was needed.

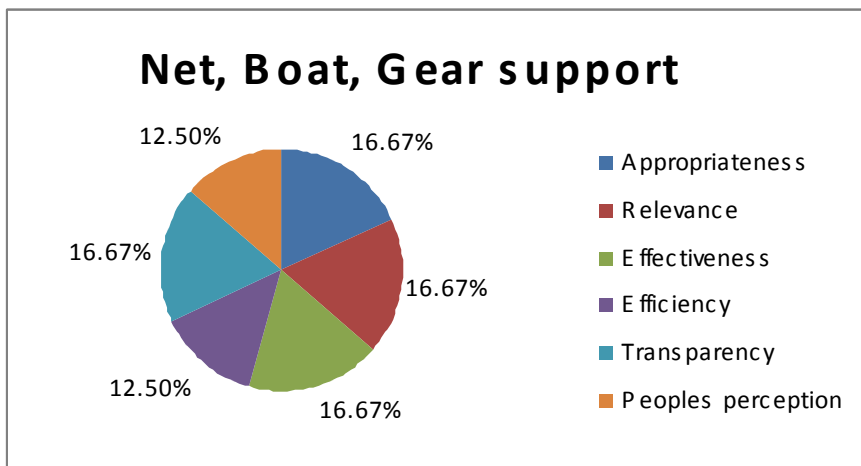


Figure-25: Pie-diagram of Net, Boat, and Gear support

Embankment Repair/Maintenance

- Appropriateness-----16.16%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency-----16.67%
- Transparency-----16.67%
- Peoples perception---16.67%

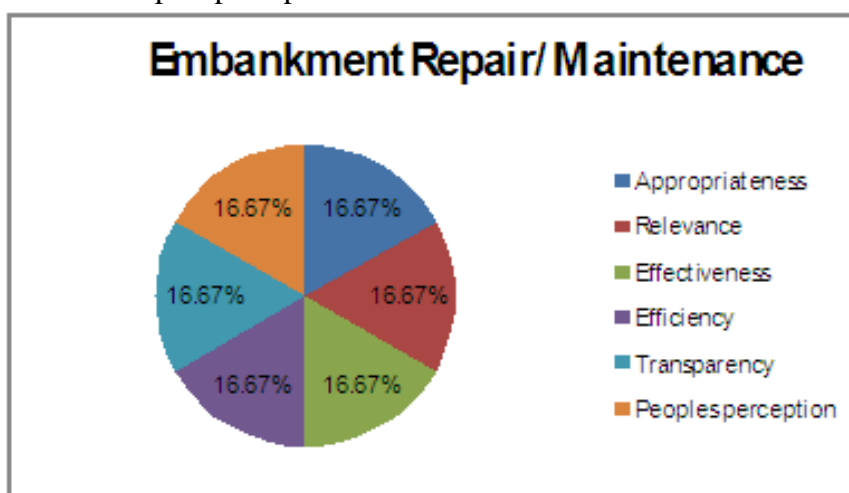


Figure-26: Pie-diagram of Embankment Repair/Maintenance

³ Bottom up approach means to consult and incorporate the local communities to formulate a development policy.

BLC (Boat License Certificate)

- Appropriateness-----16.67%
- Relevance-----16.67%
- Effectiveness-----16.67%
- Efficiency-----16.67%
- Transparency-----16.67%
- Peoples perception---16.67%

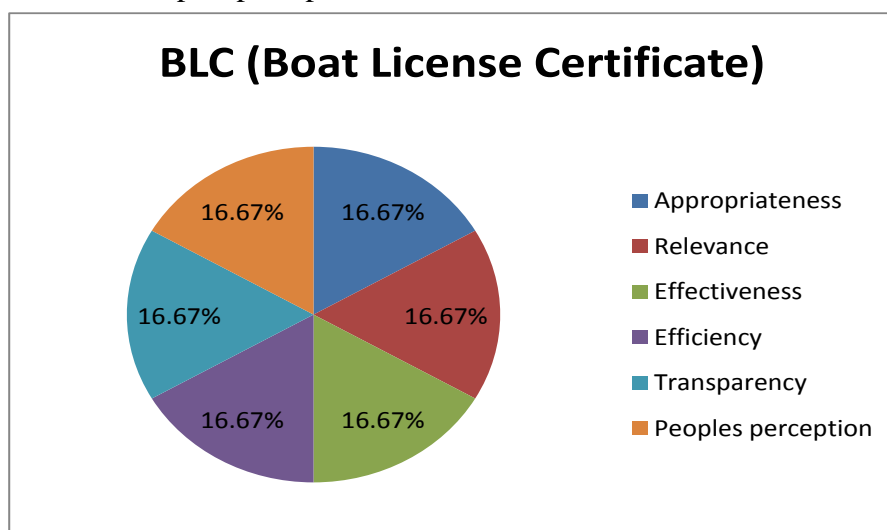


Figure-27: Pie-diagram of BLC (Boat License Certificate)

7.1. Attainment of Objectives

Table-4: Compliance of CCEC activities attainment with objectives

Objectives	Attainment
Rehabilitation of the SIDR impacted the Sundarbans stakeholders	Shelter; Net, Boat, Gear support; Small and Medium Enterprise –cooperative society
Sustainable livelihood security of the SIDR affected the Sundarbans Stakeholders	Embankment Repair/Maintenance
Reduce Risks associated with threats from Natural Disasters and Climate Change	Embankment Repair/Maintenance; Disaster Management Committee (DMC); Savings of 10 Tk. Per week from profit of co-operative society for future disaster management
Sensitize coastal communities on sustainable the Sundarbans conservation	Mangroves Regeneration and Plantation; Awareness
Poverty reduction of the underprivileged the Sundarbans stakeholders	Small and Medium Enterprise –cooperative society; Net, Boat, Gear support; BLC (Boat License Certificate)
Raising public awareness through mangrove regeneration, biodiversity conservation and campaigns.	Pot gaan, Ralley, Seminer, Art competation; Mangrove Protection Day, 26 th July
The restoration of an area of mangrove forest affected by the cyclone and ensures measures are taken against riverbank erosion.	Mangroves Regeneration and Plantation; Awareness

7.2. Compliance of CCEC activities with the “Convention on Biological Diversity” and Forest (Conservation) Act

CCEC tried to obey act “The Convention on Biological Diversity (CBD)”. There are so many NGOs are working but only CCEC is working for regeneration of mangrove forest which was fully and partially destroyed by SIDR and also protection of biodiversity which lives in mangrove forest. CCEC has also tried to maintain the “Forest (Conservation) Act, 2000.

Prior to the signing and ratification of CBD by Bangladesh, it completed two major conservation initiatives namely a) National Conservation Strategy (NCS) and b) National Environmental Management Action Plan (NEMAP).

Under NEMAP, the country has undertaken for implementation of a project titled "Sustainable Environment Management Programme" (SEMP). This project has total of 26 components of which three components are directly concerned with the conservation of biodiversity in the wetlands and in the floodplains of the country through community participations. The activities of CCEC is fully in compliance SEMP project, as it has ensured community participation by forming “The Mangrove Protection Society (MPS)” and “The Sundarban Bouali, Mouali and Jalley Co-operative Society.”

The current major development projects of Forest Department are Forest Resource Management Project (FRMP), Forestry Sector Project (FSP), Green belt project in the coastal districts and Biodiversity Conservation of Sundarbans Reserve Forest. Forest Department has also implemented the training part of the project on "Training on Conservation of Wetlands in Bangladesh" funded under the SGS of Ramsar Convention. The other component of the project for preparation of a Wetland Conservation and Training Manual is under progress. CCEC already has performed several training program on “Sustainable Resource Extraction” from the Sundarbans Mangrove Forest. Now the stakeholders are much more aware not to collect the fish which contain eggs and smaller in size. In addition to this they are conscious about not extracting the smaller size crab.

As a means to conserve biodiversity in *in situ* condition, Bangladesh has three acts in which there are provisions for conservation of biodiversity through creation of Wildlife Sanctuary, National Park, Game Reserve, Fish Sanctuary, and Ecologically Critical Area (ECA). The mangrove regeneration activity of CCEC is within the government declared “Ecologically Critical Area (ECA)”. CCEC is trying to enhance the in situ conservation of biodiversity by their mangrove regeneration approach.

7.3 Sustainable livelihoods

International Institute of Sustainable Development (IISD) defines a 'livelihood' as the capabilities, assets (stores, resources, claims and access) and activities required for a means of living. A livelihood is sustainable if it can cope with and recover from stress and shocks, maintain and enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation.

Livelihoods are rarely limited to one secure job in a wage-based economy. Achieving sustainable livelihoods requires the integration of local knowledge and community strengths with contemporary science, appropriate technology, enabling policies, effective and transparent governance structures, education and training, and credit and investment. Our livelihoods also need to be sustainable over time.

The livelihoods approach starts by looking at the household and how households use their resources to make a living. Households come in different shapes and sizes and have access to a variety of resources or assets including:

- **Human capital** - our knowledge, skills and ability to labor
- **Social capital** - social networks of support such as friends, family, churches, NGOs and local government structures
- **Natural capital** - land and natural resources such as water, firewood, grazing, and building materials.
- **Physical capital** - buildings, tools and infrastructure such as clinics, schools, roads and electricity, and
- **Financial capital** - access to money including wages, pensions, credit and things that we can sell such as cattle.

Livelihoods are not just dependent on our assets. They are also determined by our capabilities. Finally, we need to look at the different activities that actually contribute to the livelihood of the household. This includes income generating work as well as domestic labor (child-care, cooking, maintenance) and maintaining links with the wider community.

7.3.1 Sustainable Livelihoods Framework

There are four key dimensions to sustainability economic, institutional, social and environmental sustainability. All are important - a balance must be found between them.

Institutions are often referred to as “rules of the game” (North 1995), meaning the social norms and traditions that establish what types of behavior are "normal" in society. This coincides with the definition proposed by Norman Uphoff in which institutions are “complexes of norms and behaviors’ that persist over time by serving some collectively valued purpose” (Uphoff 1997:6). Institutions may be formal or informal: where formal institutions stipulate rules such as constitutions, laws and property rights, while informal institutions are generally agreed upon arrangements or rules of behavior such as sanctions, taboos, customs, traditions, and codes of conduct (North 1991).

The concept of “social capital” is closely related to local institutions and collective action. These social relations determine attitudes of sympathy (or antipathy) and obligations, and go far to explain peoples' relative willingness to collaborate in collective action. Local institutions, therefore, reflect some of the “stock” and quality of social capital in a particular context.

7.3.2 Sustainable Livelihoods Analytical Framework

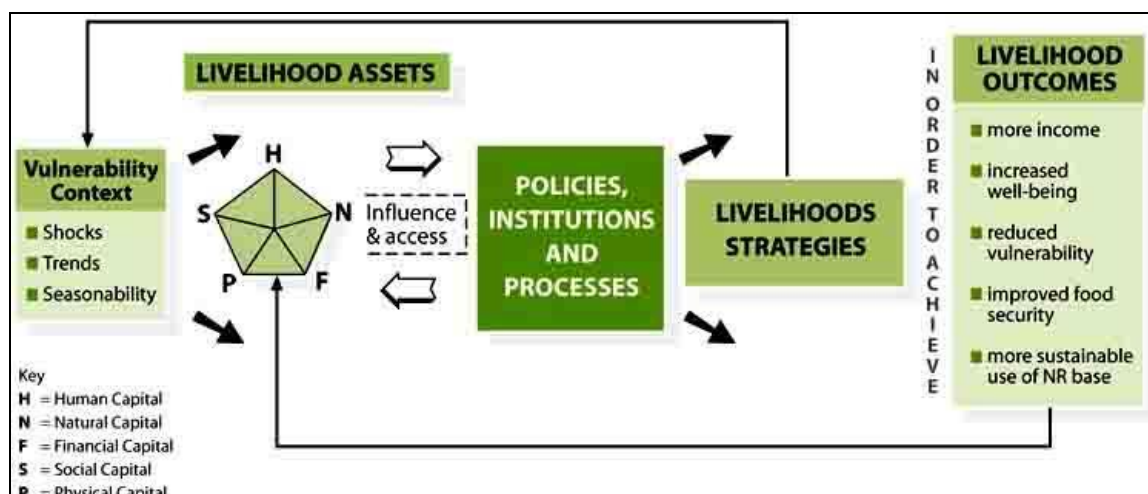
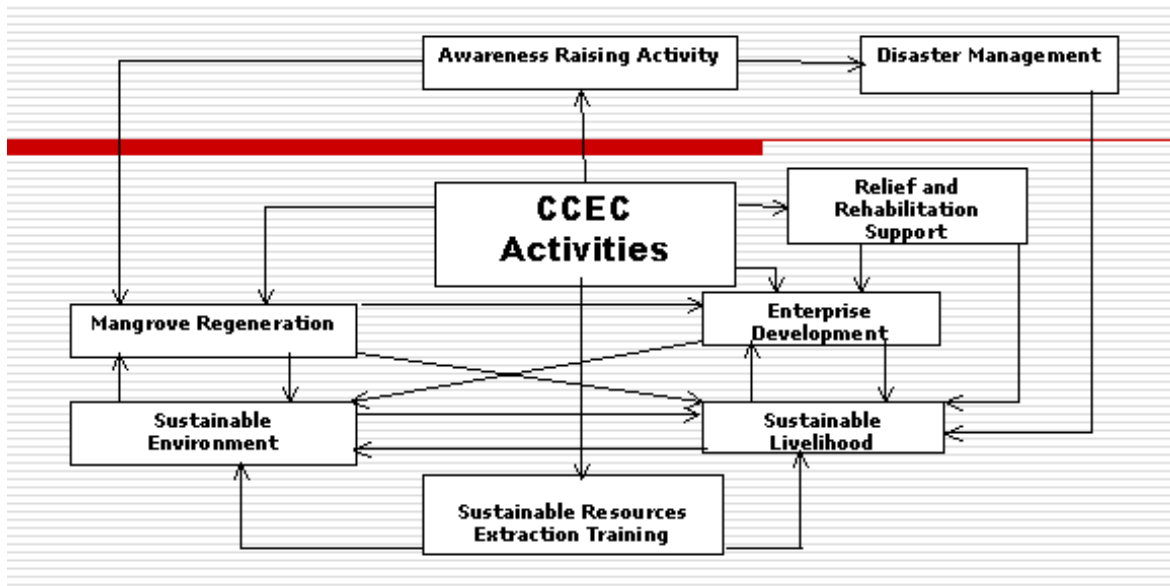


Figure-28: Sustainable Livelihoods Framework (Source: DFID, 2004)

Through this project, CCEC is concerned because of their linkages to household livelihood strategies and outcomes, for instance, in providing access to assets, sources of income, reducing vulnerability, and mitigating adverse consequences of economic policies, civil conflict and other external shocks.

The development of the “Sundarban Mangrove Protection Society” is undoubtedly a noble work. The signing of MOU between CCEC and BWDB about mangrove tree species regeneration in 57-acre area within short time is really difficult to organize in the perspective of Bangladesh. But, CCEC arranged it with effectively.

Since the establishment of “Sundarban Bouali, Mouali, Jalley co-operative society”, the stakeholders are depositing 20% of their profit in a bank account, so that they can cope with the future potential disaster in an efficient and sustainable fashion.



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Figure-29: Potential sustainability attainment by CCEC activities.

8. Barriers to achieve the Project Outputs and Outcome:

8.1. The Organogram-Human Resource Management (HRM):

The human resources who were employed in CCEC under the project “Rehabilitation of SIDR Affected the Sundarbans Stakeholder” was: Programme coordinator (1), Training/Monitoring officer (1), Publication assistance (1), Field supervisor (3), Computer operator (1), Project accountant (1), and Office assistant (1).

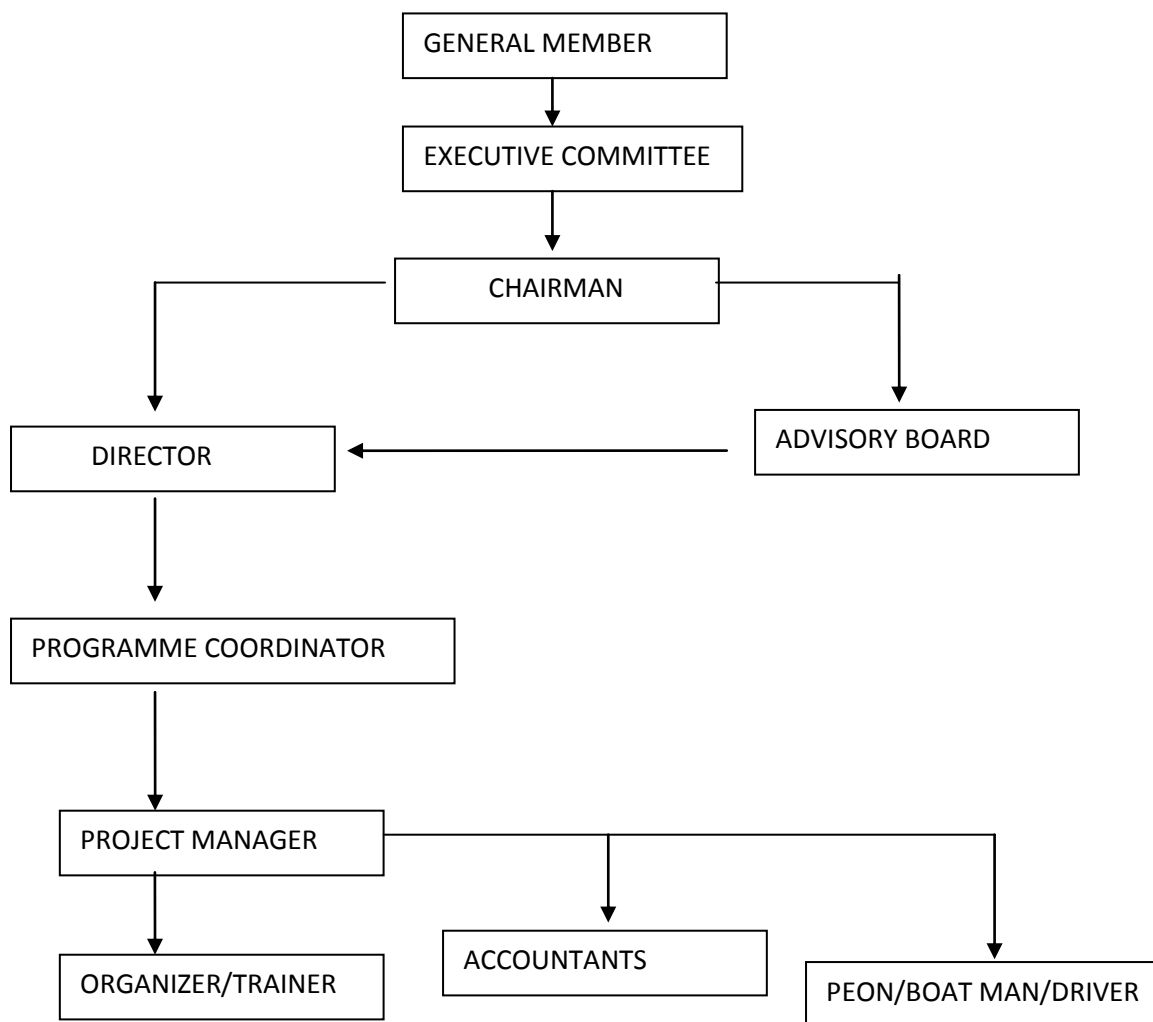


Figure-30: The organogram of the project

To implement such a project it was needed more field supervisor for intensive observation of the activities such as mangrove regeneration and protection.

8.2. Financial Barriers:

CCEC should establish links with more international and national agencies in order to build capacity and set own infrastructure to become reliable with community working.

Foreign Funds

To implement the project “Rehabilitation of SIDR Affected Sundarban Stakeholder” in a sustainable fashion, such as ensuring water supply and sanitation, education, family planning etc. more funds were needed.

8.3. Socio-cultural Barriers

The people of this area is divided into various small groups and not united. But, to ensure sustainable livelihood it is essential to bring all of them in a platform, where they can act by mutual understanding and community based management.

8.4. Political Barrier

In our country, political sustainability is not available and democracy is not in well practiced form. To achieve complete success, political sustainability is a prior requirement.

At the initial stage of project implementation, several local leaders had insisted the field officers to select their own side people. At last, it was managed somehow.

8.5. Environmental Barriers

Communication

Most of the roads in this area are not in good condition and the vehicles are not speedy enough. But for the fast transportation of resources (fish, crab etc) to the market both good quality roads and speedy vehicles are essential.

Weather

As Southwestern coastal Bangladesh is a climate change induced disaster prone area, every year tidal floods and storm surges destroyed large areas of this area. But the cyclone shelters are in far distances and it has not enough area for accommodation of all the people of this area.

So, it is crucial important to build sufficient cyclone shelters to support all the people of this area at least one in Kalbari, area and another at Harinagar area.

Food and Other activities

The stakeholders lend money at high interest from the moneylenders (“mahajon”) when they go for fish, crab, honey or golpata collection. Mahajon bound them to sell these resources at low cost to them in addition to take extra percentage of the profit. The stakeholders could free from injustice of the “mahajon”, if the Government formulate interest free loan around the year.

So, Government should afford loan free interest to the stakeholders, so they can conduct some kind of business and maintain their livelihood when entrance to the Sundarbans is restricted.

Others

For sustainable development of the Sundarbans stakeholders hygienic sanitation practices need dreadfully, but it is not available among people. They use “katcha latrines” which induce the spread out of diarrhea, cholera, typhoid, dysentery and other diseases.

During resource collection from the Sundarbans, every year people died by the attack of wild tigers. Besides this, robbers while collecting resources in the Sundarbans kidnap the stakeholders, though the security forces of forest department are active. The stakeholders must be protected from the tigers as well as from the robbers.

9. Suggestion /Recommendations of the projects

- *Based on the Projects Outs or Inputs*
 1. Sufficient cyclone shelter center should be constructed.
 2. Disaster preventive housing.
 3. Integrated tree plantation on the both sides of the embankment
 4. Awareness rising activities for sustainable resource collection
- *Financial Management*

- Government should provide loan free interest to the stakeholders.
- *Development of the Organogram*
More field supervisor should be employed by CCEC for intensive observation of the activities such as mangrove regeneration and protection
- *Missing/ Gaps*
 1. Alternative livelihood options creation
 2. Protection of saline water intrusion in the coastal zone
 3. Technical support for the coastal resources extraction
 4. Social mobilization for protection of the Sundarbans

10. Conclusions

The work “CCEC done” is an innovative people’s needs but supporting program that can enhance the societal development of the remote coastal village that can always suffering from natural disaster like SIDR. The activities of the project is really addressed the target groups of the area, whom really needs the development precursors like that already made an instructor by CCEC. Sundarbans Handicraft program seems long way to eradicate poverty and more financial investment is required for generating income and achieving sustainable development. Again the intervention needs a good infrastructure and more organized organogram with huge amount money either from the country or abroad. CCEC can make the more afford in future if it can get support. Finally CCEC is already established an innovative and need-based program that could claim as sustainable in terms socially adjustable, environmentally friendly and economically participative. Rehabilitating these communities with enterprise development was not only a poverty reduction strategy for the vulnerable community but also a starting point for managing with the consequences of future disasters.

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