

State Level Workshop on Lessons in Disaster Management-
The road ahead for West Bengal.



19th - 20th November 2008

Ramakrishna Mission Ashrama Narendrapur, Kolkata 700103
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0. Introduction

Natural or anthropogenic phenomenon, that pose a threat to human lives and property is called hazard. Nature is at work 24 x 7. Therefore, a river keeps eroding, mountain slopes under given conditions move down to cause landslides, earth trembles causing earthquakes etc.

West Bengal lying on the east of the country has a peculiar disposition. It is a coastal state as well as a state with highland like Darjeeling and the state has the vast Ganga-Brahmaputra plains too. Like any other state, West Bengal too has its share of natural and man made hazards like cyclones, floods, droughts, landslides, subsidence, occasional earthquakes, pollution of surface and subsurface water etc. It is therefore, clear that the state of west Bengal needs a disaster preparedness and mitigation plan as it is one of the most disaster prone areas in India. If the change of weather patterns are taking place as predicted by experts, worse is knocking at the door in the form of more frequent storm surges and other forms of natural disasters is expected to follow suit.

The Workshop

The workshop was carried out in purview of the Community Based Disaster Risk Management (CBDRM) project supported by DIPECHO and Welthungerhilfe and implemented by the Ramakrishna Mission Ashrama, Narendrapur. In the course of the project the interaction with other NGO's, specialists and government departments revealed the need for a long term strategy for disaster preparedness in the Sundarbans.

The aims of the workshop are

- To bring different stakeholders together and reflect on the past experience of CBDRM in the Sundarbans
- To reflect on actual level of preparedness in the Sundarbans
- Recommendations for long term preparedness and risk management in the Sundarbans

The venue was Ramakrishna Mission Institute Ashrama Narendrapur, Kolkata. The event tipped off from the 19th to the 20th of November 2008.

Disaster preparedness especially in the Sundarbans now, is no longer an option but a necessity. Time has come to build on past experiences and draw up a practical and effective plan for disaster management aimed at reducing risk to people living in disaster prone areas and to making them better prepared to face situations in the future.

I. Inaugural function

The programme commenced at 10:40 A. M. with the august presence of Swami Asaktananda, Secretary, Ramakrishna Mission Ashram, Narendrapur lighting the candle and symbolically waning out darkness in front of the photographs of Ramakrishna Paramhansa, Sarada Ma and Swami Vivekananda.

Dr. Manas Ghosh welcomed the participants. Helping the down-trodden, calamity-struck people of the Sundarbans was the common consensus in his welcoming speech. Abject poverty along with repeated natural disasters both slow on setting and catastrophic for the last 30 years have marred the livelihoods and have crippled life in the most vulnerable areas of Sundarbans from time to time. Efforts by NGOs and Governmental organizations to help the people of Sundarbans to get back to normal life, were repeatedly dislodged due to certain and sudden annual disasters. Catch line *Jhorer Chokhe Chokh Rakho* (keep an eye on the gory eyes of the tempest), instead of getting intimidated can be combated with intelligence, sincerity and hard work.

Swami Asaktananda emphasized in his welcome address on proper motivation, implementation of ideas and fearless participation of the young generation who can serve as the real change makers. As an example he referred to the philanthropic work done by Margaret Nobel (Sister Nivedita) in a polio and plague hit Kolkata. He said we should never forget that technological success and poverty and starvation are the two sides of the same coin, i. e., India.

The villagers from Sagar Island sung a song of CBDRM saying *Radio te dicche khobor nimnochaper* (the radio is airing songs of low pressure).

Dr. Joachim Schmerbeck, Project Head, Welthungerhilfe, introduced the work of DIPECHO in India. He explained the structure of the European Union and position of DIPECHO within it. DIPECHO is the disaster preparedness programme of the Humanitarian Aid Wing of the European Commission: ECHO. Under the DIPECHO programme vulnerable people all over the world get prepared for natural disasters of all kinds. He showed a small footage on the work happening under the 4th action plan of DIPECHO in India.

In his key note address Dr. Bernhard Höper, Chairman, Welthungerhilfe emphasized on the need for more work at the grass root level together with the right blend of volunteerism and professionalism. He also pointed at the need for a right balance in knowledge transfer to beneficiaries as well as incorporating their indigenous techniques and equipments into preparedness activities. Referring to the recent floods in the Sundarbans he addressed the unity of all actors in the field to overcome the situation.

Finally, Dr. Manas Ghosh warmly thanked everybody involved in the project activity and the facilitators of the workshop and pointed out that without the support and commitment of everyone the work could not have been done..

II. Session 1-State of Knowledge of flood/cyclone in West Bengal.

Chair: Dr. Joachim Schmerbeck

II. 1. Disaster in West Bengal

Dr. D. Dasgupta, Consultant for Disaster Management

West Bengal lying on the east of the country has a combination disposition. It has a coastal zone, the vast Ganga-Brahmaputra as well as the highly elevated Eastern Himalayas. This diversity in landscapes brings along a diversity of hazards like cyclones, floods, droughts, landslides, subsidence and occasional earthquakes. As a result, 84% of the state of West Bengal is multi-hazard prone while the main natural hazards in West Bengal are floods, cyclone, droughts, and landslides.

Hazards and Risks in West Bengal

The coastal belt of West Bengal is prone to cyclones, high tides and increased littoral inundations and erosion due to increased tidal height as a result of global warming. Few districts of West Bengal are also facing high rates of river erosion. Murshidabad and Maldah are two such examples. Tsunami is another hazard that the coastal areas have to remain geared up for. There is a record of 3 lakhs people being killed in 1757 in places like Khidderpore, Sagar and South 24 Parganas due to a tsunami; between 1985 and 2007 West Bengal has faced 23 major floods from rivers ironically that originated outside the state.

During monsoon, there are large areas which suffer from prolonged water-logging, including the state capital, Kolkata. There are regular outbreaks of epidemics after floods, cyclones & increasing rates of vector-borne diseases which in many recent years have reached pandemic proportions.

The hilly areas of Darjeeling are highly prone to landslides & earthquakes. One of the root causes for the increase of land slide in all likelihood is the construction activity on the hill slopes.

It is however worthy to note that human interference may accelerate the pace of such natural disasters. Since 1968, twenty thousand landslides have occurred in that area. Earthquakes have low frequency here but there is a history of earthquakes in the state in 1897 & 1950. Kolkata, South & North 24 Parganas, the industrial belt from Durgapur – Asansol & the hilly areas have been identified as high risk areas. Land subsidence is very high in the coal mine areas in & around Raniganj. Districts of West Midnapore, Bankura, Purulia and Birbhum are prone to droughts on a regular basis. Alluvial terrains everywhere face droughts due to less than required rains and agricultural droughts due to lack of moisture in the soil.

The Sundarbans presently is at high risk. Few islands have already submerged and some are under threat due to turbulent river behaviour and rising tidal level; Ghoramara Island in the Sundarbans is one such example. The strong erosion on this island has already caused a number of environmental refugees. Now there is need for preparation measures like mangrove plantation, housing pattern and adapted livelihood practices. Other mitigation measures like efficient early warning system and its dissemination and equally effective search, rescue and rehabilitation system and alternative resettlement plan for those living in highly vulnerable areas should be taken up as a priority.

II. 2. Coastal erosion in the Sundarbans :An overview

Prof S. Hazra, School of Oceanographic Studies, Jadavpur University, Kolkata

The Sundarbans is the largest single block of tidal halophytic mangrove forest in the world. Over 70, 000 people from the Sundarbans are under the risk of losing their habitat permanently due to sea level rise, increased cyclone intensity and flooding by the year 2030. Talking about the disasters the first thing that should be kept in mind is that disasters are of two types:—

- i) The rapid disasters like tsunami and
- ii) The slow on setting ones like arsenic contamination and coastal erosion.

Rapid disasters have a time span of an hour or a day. There are Disaster Management Plans by the Government of India for earthquakes but no such plans for slow on setting disasters like coastal erosion and climate change. The 2004 tsunami has made the people aware that disasters can come from the sea also.

The Bengal coastal system is different in two parts. The Digha area exhibits an open coastal system and the Sunderbans exhibits an estuarine system. The estuarine area of the Sunderbans is a macrotidal, low lying flat area with practically no elevated lands or sand dunes for natural protection. The Sunderbans are only 10, 000 years old. The first human settlement started at 5th century B. C. and the area was mapped by the Surveyor General as early as 1764.

The forest in the Sundarbans is a unique depository of gene pools and biodiversity. The mangroves which are present here have plenty of medicinal uses and they are the home to an extraordinary wildlife like the Royal Bengal Tiger. Since the 13th century the forest has continuously been transformed to agricultural land. Systematic management of this forest tract started in the 1860s after the establishment of a Forest Department in the Province of Bengal. The British colonial rule saw the construction of embankments and today there are 3520km of embankment as per Government reports. The tidal water height in the tidal estuary can go up to as high as 6m every day during the high tide. The fragile embankments and the raised river beds are leading to erosion. A case study in Laxmipur (Kadwip Block) showed that 60% of the village land has been eaten up by river Bartala since 1923. Since 1980 over 0.4 million people have been affected by flooding in the Sundarbans out of which around 600 families had to migrate and settle elsewhere.

The major impact of climate change is the sea level rise. It has created a high risk of island inundation and loss of land in the Sunderban system. Already 12 sea facing islands of southern Sundarbans have been assessed to be highly vulnerable. From the annual sea level measured from Sagar Observatory it can be concluded that the rate of relative rise of sea level has accelerated from 2002. This trend will be very difficult to tackle unless we take care of the excess warming due to excessive GHG emissions in a participative way. High intensity severe cyclonic storms are also rising over Bay of Bengal creating increasing coastal erosion & flooding by storm surge.

The climate change and its consequent slow and gradual on setting disaster are taking place all along the coast of India. Wildlife experts say that rising sea levels and coastal erosion caused by global warming are steadily shrinking the mangroves of Sunderbans and threatening the survival of the endangered tigers. So loss of these mangroves due to inundation by sea water

will lead to huge loss to the civilisation which can not be properly evaluated by present economic methods.

The government should re-orient their Disaster Management and Preparedness Plans keeping the issue of climate change in mind. Further, it is recommended to formulate a policy for the environmental refugees, to look for a long lasting and durable solution, to establish a proper protection system in the future and finally to raise proper awareness campaign programmes.

II. 3. Strategy of the Government of West Bengal to cope with future challenges of disaster management in the Sundarbans

Mr. S. Acharya, Joint Project Director, Sundarban Development Board (Presented by Ms L. Raman)

A hundred years ago, Sundarbans was a marshy delta of 10, 000 square miles, full of mangrove forests and infested with more than 15, 000 tigers. Recognised as a UNESCO world heritage site, this region's eco-balancing system is in danger from the rapidly rising sea. This affects the parts of the Sundarbans under settlement and cultivation as well as the tiger reserve. About a fifth of the southern part of the delta, the heart of the tiger reserve, is already submerged. The rising seawater surface everyday causes coastal erosion, resulting in erosion of vegetation habitations and agricultural land. Cyclones, breach of embankments and climate change and sea level rise are the three main vulnerability aspects of the Sundarbans. Presently, the erstwhile Relief Department has been renamed as Disaster Management Department. Previously the department was only associated with relief and post-disaster measures but now it takes care of disaster management as a whole including increasing awareness, preparedness and mitigation measures.

The disaster mitigation strategies of Government of West Bengal are as follows-

1. Proper bulwark construction-

Strengthening of existing embankments for protection of enclosed land from inundation and salt water intrusion.

2. Protection of the littoral borders-

Protection of river banks (inhabited islands) from eroding away due to strong river currents or wave dash.

3. Large scale Mangrove Plantation –

Protection of sea beach from eroding away by large scale plantation of mangroves along riverside embankments

4. Temporary refuge construction-

Identification of possible location of cyclone shelters to provide temporary refuge to the people living in the most vulnerable zones.

5. A stitch in time saves nine –

Possible linking roads construction to connect vulnerable regions to safer locations.

6. Early Warning System –

Setting up of early warning system to communicate to people on natural calamities involving district administration and Principle of Responsible Investments (PRIs) with the support of Indian meteorological department.

7. Post disaster re building –

Conducting a good post disaster management, including relief measures, renovation, construction of damaged assets and a good communication network.

II. 4. An overview on work done by NGOs in Sundarbans

Fr. P. Roy, Consultant of Disaster Preparedness

Today several programmes in the field of CBDRM and CBDP running are as follows:

1. Ramakrishna Mission with Welthungerhilfe under European Community Humanitarian Office for Disasters (ECHO).
2. Indian Institute for National Strategic Studies (INSS) with United Nations Children's Fund (UNICEF) under the European Community Humanitarian Office for Disasters (ECHO).
3. Public Understanding of Science (PUS) with UNICEF under– ECHO
4. Public Understanding of Science (PUS) with CARITAS

These programmes covering South 24 Parganas are actively participating with

- 26 GPs working under its supervision and
- 214 booths are operating.

In addition a joint project of the United Nations Development Programme (UNDP) and the Government of West Bengal –covers 312 Gram Panchayats of 29 Blocks.

There are different approaches in CBDP and CBDRM that can be observed today

1. Project approach

Activities formulated are then executed, often aiming mainly at the donors satisfaction and the vision is guided by the availability of funds, no major change in the mindset.

2. Activity approach

Similar to the project approach, stereotype implementation according to standard procedure, the major disadvantage is a tendency to take shortcuts, output oriented but not process oriented, little impact on the family level, it actually involves the people who are easily available but not the weaker section of the community.

3. Education approach

Awareness campaigns and teaching on how to get prepared for the disasters and to adopt respective measures, no promotion of a self thinking process, as a result people are unable to find own solutions.

4. Committee approach

Action through committees in which members are chosen by the people, good linkages and access to resources can be established, but only a few powerful people of the community are involved and the poorer / weaker section of the community do not get a voice.

5. Self Help Group (SHG) / Economic Approach

A lot of preparedness works will be done on family level, which becomes a platform for economic empowerment. But the groups are exclusive in nature and only those who have a mindset for development can reap benefit out of it. The poorest of the lot are not in the SHG and thus they are excluded.

6. Disaster and Risk Reduction (DRR) Approach

Here community based preparedness is supplemented with mitigation and structural measures and larger investments are needed, danger that structural measures are given more importance than the preparedness process, people get used to the funds coming in and get less proactive.

Recommendations:

- Process oriented approach should be there.
- Whole community to be involved with focus on most vulnerable groups.
- Focus on every family is intended.
- Community ownership should be there.
- Linkages / Convergence should occupy a special place of planning.
- CBDRM should act as a hub of convergence.
- Agency must leave no stone unturned to inculcate an enthusiasm among the people.
- Confidence in the peoples' capacity should be there.
- Building on the peoples' coping mechanisms is desired.
- Helping people to reflect and find their own solutions and other modes of independence must be explored.
- Preference for low cost and indigenous measures should be there.
- All are stakeholders (PRI, Govt, CBOs, Institutions).
- Role clarity should be there.

And lastly it can be concluded that NGOs are matchmakers so it is the duty of the community to face the disasters in participatory manner.

III. Session II-Case studies of disaster risks managements of floods and cyclones from West Bengal and Bangladesh

Chair: Fr. I. P. Sarto

III. 1. Living with Disasters in the Sundarbans

Aurobindo Senapati, Villager from Boatkhali, Sagar Island.

The flood on September 16th, 2008 was devastating. That day the water during the high tide around 10:30 a. m. had crossed the embankment and destroyed two sluice gates. As per instruction from the Panchayat Sabhapati, inspection was initiated by the supervisor, Samir Mazumdar, along Dublat via Shibpur to Panchanandapur. Usually the water during the pre-winter rises in the afternoon; but during the night the water level was not that high. There is a 1600-1700 feet stretch along the coast that does not have any embankment. The rising river water attacked these areas. Warnings of a possible flood was announced at around 8:30 p. m. At night the water level started rising and it was flowing at a height of 2 feet above the embankments. The rescue operations were taken up.

Aftermath of the 16th September flood:

- A few hens and cattle could not be saved but there was no human casualty.
- 10, 000 bighas of agricultural land were destroyed.
- 8000 people rendered homeless
- 300 houses collapsed. The rescued people were provided shelter in Kadambari School, Primary School, Ratanji School, Atal High School, Manasa Mandir and other buildings of the locality.
- Of the houses built on both sides of the road along a 1km stretch only five houses could be saved.
- Two of the ponds became saline.
- Booth No. 102 was totally destroyed.
-

The adjacent booth No.106 was also destroyed. A request to the Ramakrishna Mission was placed to take up this booth as a part of its works.

Custodian of relief materials

Relief materials, grains, water, essential commodities, mikes megaphones can be kept in safe custody from beforehand. The Sunderban Kalpataru has taken a lead role to safeguard all these backup survival materials in the safe zones.

Construction of model houses and ponds

Two model houses and one model pond are being made. The villagers now want two more model houses and three more model ponds so that sufficient water is available during crisis.

Digging tube wells

Construction of one or two tube wells will be a major gain. Drinking water supply system is an area of utmost importance. So besides the model ponds, digging a few deep tube wells can augment the living condition of natural disaster victims.

Fruitful outcome of campaign

The various awareness programmes and CBDRM knowledge based programmes for disaster preparedness in block level have turned fruitful as during the recent submergence at high tides no valuable documents like the 'dalils' (land holding documents) and ration cards were lost. These are of utmost importance as loads of complications crop up post a natural calamity.

Help at hand

The civil defence has played a valuable role by training the villagers and lending out a helping hand whenever required. The concept of self sufficiency can go a long way in times of need. Relief in all forms takes time to reach the concerned site. Logistics plays a big spoilsport in such a situation so to supplement these pitfalls it is always wise to be up in arms. The villagers have to stand for each other as they are the key stakeholders.

Generating a corpus fund

The villagers have also decided to raise a small fund of their own which can be used during sudden needs. Even if the villagers do not get any support from the government or any organization they will continue to fight by themselves. Apart from assistance from RKM and their own contingency funds more funds are needed.

Thus the above mentioned are some of the ways and means by which the level of disaster preparedness can be boosted. Sundarban Kalpataru has come up with many exemplary steps that can be reckoned with and adopted by other such organizations.

III. 2. Living with Disasters in the Sundarbans.

Haripada Samanta, Member of Zilla Parishad.

It is quite thought provoking that whether through the Panchayat Raj the planning can be done from the grass root level or not? The two major disasters which hit South 24 Parganas are flood and cyclone. These natural disasters bring about saline water intrusion which damages agricultural land, animal husbandry, other animal resources, embankments and drinking water sources. Working at Panchayat level has revealed that the disaster victims actually feel helpless. But the interventions by the Government bodies, NGOs, Gram Unnyan Samity make people come closer to each other. The Tristariya Gram Panchayat (3 Tier Local Governance) system has made this possible. In 1983 the Gram Panchayat had no knowledge of a natural disaster beforehand. Steps were taken only when a disaster would hit.

The non reliability of the weather forecasts given by the Meteorological Department of West Bengal is making the local community of the Sundarbans indifferent towards any kind of warnings given by the state. Instead, the areas adjacent to Bangladesh prefer to follow the forecast made by Bangladesh which actually coincides with the real weather conditions. People have somehow lost their faith and are mostly ignorant about these disasters.

People believe that the food materials as relief are not reaching them. The Government, GOs, Panchayat level and the village community should be well woven. The RKM with other NGOs are working jointly at the grass root level and this DRMP programme is there for strengthening it. Working in a stronger system is much easier than working with a weaker system.

Thus the concept of Community based planning mechanism came into vogue and Panchayat started to play its role.

A monitoring team has been formed with the help of Panchayat and civil defence to combat these problems. A committee is formed for DRMP (Disaster Risk Management Programme).

However, because of heavy load on Panchayat there are always some loopholes in constant vigilance on the Disaster Risk Management Programme.

There should be some predefined enquiries like:

- Key stakeholders list
- List of skilled personnel
- Area of land under inundation
- Number of boats –their availability and owners
- Identification of relief shelters beforehand for DRMP.

Through the implementation of CBDM it is now easier to rescue people from different natural disasters. Through various techniques of announcements one can alert the people and send relief materials to them as and when required.

III. 3. Traditional Coping Mechanism during Disaster.

Sister Sampurna , Palli Unnayan Samiti, Baruipur.

Though science and technology has developed tremendously, the 20th century saw natural disasters and loss of human lives going up hill. One of the greatest challenges today is to protect and safeguard human lives, properties and live stocks against probable natural disasters. Early societies used to protect their properties and resources by anticipating potential dangers based on traditional knowledge of possible destructive events and then by investing in protective measures.

Traditional indicators for identifying early warning for a disaster are:—

Animal behaviour, changes in the nature, changes in weather and sea/river pattern.

Traditional indicators for flood and cyclone are:

Animal Behaviour

- The ants and snails move to higher places.
- Water snakes such as Jaldhora come to land, poisonous snakes climb the top of trees.
- Fishes of the ponds become very active during the rain.
- Cattle uninterested in eating or drinking but look up at the sky and try to roam around.
- The birds including hens leave feeding and settle on the branches of the trees for sometime.
- The dogs restlessly move here and there and bark unusually.

Changes in Nature

- When ring/halo appear around the moon/sun.
- During the winter if the fog becomes very dense this indicates heavy rain during the next monsoon.
- If the smoke of the oven moves downwards.
- When the northern sky becomes very reddish during the sunset.
- When the clouds of the topmost layer of the sky moves spirally.
- During winter and spring reddish clouds appear in the western sky at the time of sunrise.

The traditional early warning systems are

- Blowing conch shells and buffalo horns and beating metal drums,
- Use of manual mikes, alarm and signals by the *chowkidar*,
- Information via village leaders to the community,
- Using church bells mikes in Masjids and ringing bells made of shells

Traditional preparedness includes

Mode of Storing Food.

Preservation of food like dal, rice and puffed rice in big clay pots or metal drums and fuel by keeping them on raised bamboo platforms or *machan*. Crops are stored in granaries called Dhaner Gola.

Means to combat starvation.

Tribal communities know the places where they can find Roots and Shoots of different trees and plants which they can consume during the period of starvation.

Mobility.

People use pitcher (clay pots), banana plants and metal drums as a raft during flood. boats and donga are also used as means of transport.

Shelter.

They make temporary makeshift shelter on boats during monsoon and floods. People build houses with low sloping roof .The roof of the straw houses is protected by rope-net made out of straw or fishing nets.

Storage of assets and valuable documents.

People keep their valuable assets like gold and silver ornaments, coin etc. in pitchers and bury them in the ground. The valuable documents like land deed, certificates, and currency notes are kept in a container made of bamboo.

III. 4. Interaction with Government Bodies.

Aminul Hassan, West Bengal Voluntary Health Association

WBVHA has been working for the past 34 years. Sincerity and hard work have made this NGO a significant figure in West Bengal. However, citizens or NGOs should not always blame the government as a practice. Often some work gets delayed due to the long and painstaking procedures but the government do lend out a helping hand if it can be convinced. It should be the responsibility of the citizens to maintain what the government has given them.

A few strengths of the NGOs

- NGOs are flexible, accessible and widely acceptable.
- They do not have any fixed working hours but they have a committed whole time work force.
- NGOs are unbiased, secular and profiteering.
- NGOs assure cost-effective infrastructure, manpower and administration. Less investment and higher yield is the mantra of the NGOs.
- NGOs are skilled in negotiation, advocacy and consensus building.
- They work in teams and can communicate effectively. They solve the problem and take decisions instantly.
- NGOs believe in result based management.

- Success of NGOs is because of the participation of the Self Help Groups (SHGs).
- The main objective of the NGOs is to build up a better public image. This can be achieved only through quality work.

NGOs are often approached by the government to help them organize workshops and exhibitions and to advertise about the various work programmes taken up by the government for social wellbeing. The trust of the government can be won by transparency of work and keeping good rapport with the government.

A few recommendations

Sometimes the government is rigid in maintaining its protocol. Policy and strategy is set in the highest level. Reform, which is very much required, is a lengthy and often suppressive process. Also extensive coverage by the media has resulted in non-disclosure of any comments by the government representatives.

Committees should be created one by one for redressing issues.

- Government-NGO collaboration is very much needed in today's situation.
- PPP (Public Private Partnership) is a priority.
- It is their work to bridge the gap between the Government (the service providers) and the people (recipients).
- Experience and good practices should be shared.
- Networking for collaboration with line departments should be strengthened and expanded.
- Deliberation on issues of importance through advocacy should be done.
- Empowerment of civil societies for action is required.
- Identification of unmet needs and suggest for immediate but long term sustainable solution is necessary.
- There should be representatives of NGOs in government constituted bodies.
- A joint effort by the Human Resource Development, skilled man-power and proper distribution of responsibilities is what is required for an all round success.

Reform is very important with the changing pace of global trend. Demands from civil societies and industrial sector are very high. Reviewing and restructuring process is on its way. NGO-government partnership is on increase. Opportunities of private participation should be strengthened.

III. 5. Sustainability of Community Based Disaster Risk Management (CBDRM), in the Sundarbans

Shyamal Mukherjee, In-Charge of South 24 Parganas, Red Cross.

The Sundarbans comprise of 102 islands with varied biodiversity and rivers like Hoogli, Bartala, Bidyadhari, Thakurani etc which are fed two times a day by the sea tide. The Sundarbans are vulnerable due to flood, tidal effects, saline water ingression, coastal erosion, earthquakes, snake bites, tigers etc. The area receives about 180cm of annual rainfall of which 75% occurs during the rainy season. Cyclones usually play havoc from June to November. About 3500km long stretch of embankment has been constructed for survival. Earlier Red Cross used to distribute milk and blankets to the disaster affected victims. But now Red Cross in India has identified 10 disaster prone states to carry out preparedness work and West Bengal is one of them. Again in West Bengal 13 districts have been identified for disaster risk management programmes. There are volunteers who are training the villagers through a proper Disaster Risk Management Programme.

The Red Cross has completed training programme at Block level; DRMP has catalysed the Government to step into the life of the village community. The BDO's team and BPOMH team has come closer together to the village level in PRA system.

In this system,

- Villagers together with the Red Cross team meet regularly and collect data, check the data, draw vulnerability map, location of schools etc, check out availability of doctors during disasters.
- The volunteers spend time and go to the villagers for direct observation.
- They plan out transects at every 100 yards.
- They mark the lowlands and highlands, like the school buildings, houses, wells etc.
- They also consult together and discuss about the seasonal calendar like the occurrences of rain, cyclones, dates of different festivals etc.
- They decide the time for cultivation, fishing etc.
- They chalk out the seasonal problems and draw a livelihood chart for them involving 20% fishermen, 10% service holders and obviously 70% agriculturists. They then formulate their course of work so that they can earn a better livelihood and can cope up with any kind of disaster which comes in their way.
- They also study the historic data of the last 10 years of demographic changes and try to project the future, for example if it was 300 then, 500 now and in future it may be around 700. Based on this first level information they discuss with the community leaders their view points and their approach for solving these types of problems.
- They have some educational programmes to promote awareness to disaster management among the villagers. The villagers are taught first aid measures to see through a situation where there is a crisis of doctors.

In this way with the help of the villagers they are successful in designing a plan of action to overcome the pre assessed vulnerability caused by various disasters with the short term, mid term and long term goals.

The major problem areas that were identified was proper rehabilitation and resettlement locations are to be identified and funds are to be pooled.

III. 6. Embankment situation and vulnerability in the Sundarbans Preliminary results for the Lakshmipur case

S. Hazra, School of Oceanographic Studies, Jadavpur University, Kolkata

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An assessment of the embankment conditions as well as the vulnerability of the people in Lakshmipur Mouza, Kakdwip, Sundarbans, was carried out that allowed us to indicate on digital maps the interaction of embankment conditions and livelihoods of local people.

The Sundarbans are known for its exposure to natural disasters. Formed since 10000 B. P. by sediments of the Ganga and Brahmaputra river, it is today the largest river delta of the world. The Sundarbans are a very dynamic system facing land erosion (and accretion in the sheltered part as well) in a high frequency. Human settled face a continuous transformation of forest into agricultural land. Today 3520 km of (recorded) embankment are minimising the erosion and overtopping of land and protecting the human habitations. Many of these embankments (approximately 820 km) are weak and break often, leading to loss of property and often forcing people to migrate. The effects of the ongoing change of the world climate may worsen this situation.

In the frame of a CBDRM project (www.cbdrm.org) supported by DIPECHO and Welthungerhilfe and implemented by the Ramakrishna Mission Ashrama in Narendrapur, collected and analysed information with the aim to assess the role of coastal erosion and embankments in the life and livelihood of local people in Western Sundarbans and to suggest options for vulnerability reduction.

In Lakshmipur Mouza, one of the villages in the Sundarbans most vulnerable to erosion, the conditions of embankment were assessed and some 267 households interviewed regarding livelihood pattern, vulnerability and losses through disasters.

Lakshmipur lost more than three quarters of its area since 1925, almost half of its 2377 meters of embankment are weak and 10 % are breached. Out of 267 households 200 are affected by at least one of the last two coastal floods. As the main income for the people is gained from agriculture and fishery, income from labor work for embankment repair is not a priority for them but almost all household are engaged in the embankment maintenance for a source of income.

Only very few houses are safe and most houses are apprehended to get damaged when embankments are breaking. There are only few makeshift rescue shelters (school building) while most of them can take people only for a short while or are relative far away. 35% of the community can rescue themselves in country boats.

The GIS (Geographical Information System) data base that allowed the calculation of the vulnerability of households in respect to its position near the vulnerable parts of the embankment, house conditions, source of income and other factors that can serve as a base for regional planning.

III. 7. Empowerment of the disabled to cope with the trepidation

Bikram Mahapatra, Disability Coordinator, Handicap International.

Inclusion of disability into Disaster Risk Reduction is a new area for the Civil Society Organisations workers. Coping with disaster risk management and disaster risk reduction programme is planned for the most vulnerable group in the community; this often excludes people with disability. Their needs are not properly taken care of within the Programme. Work commenced with support from DIPECHO. The main objective of this work in India was capacity building of the stakeholders by enhancing their knowledge and improving their skills. The method included

- Development of a training manual on inclusive Disaster Risk Reduction.
- Conduction of Training of Trainers (TOT) throughout India with the participation of 25 NGOs.
- Co-implementation of programmes with 2 partner institutions. The two partners were CARE in Andaman and Welthungerhilfe with their local partners in West Bengal(RKM) and Orissa(Sambandh).
- Training of staffs and other stake holders within the community-guiding them so as to include people with disability into DRR activities.
- Supporting the teams with tools and implements like hearing aids.
- Development of a website and formulation of a Google Group.

Case story

Anima was not able to walk till 2006. She was a polio patient spotted during assessment camp. The group organized a community awareness programme in which her mother was a part. Being a part of such a programme she was very motivated and enrolled in a selfhelp group. This duty was later on handed over to her daughter Anima who now lends a hand in preparing life jackets and in other activities which require minimal movement.

Usually people from the mainstream take major decisions. So many a times they take decisions which may not be relevant for the target groups. And sometimes due to lack of confidence and being marginalized for a long time, people are reluctant to participate in the DRR activities. So this calls for a sea change in the mindset of the disabled groups of people. Sometimes in the field of charity it is often noticed that people have certain amount of expectations from the community workers. They expect tangible gains. Lack of proper awareness amongst the family members of the PWDs poses a serious threat. They are often unaware of the existing rehabilitation centers. Once that is done, a lot of people can reap a lot many benefits. They are unaware of the human rights angle of the whole issue. It is mandatory to include people with disability into the crisis management trainings. Right to Life is a fundamental right. Integrating people with multiple disabilities is still a challenge. The people with disability belong to the "lesser lot" community. So there is a lack of adequate opportunity.

Recommendations

- The people should be given the opportunity first.
- Change in the attitude of the mainstream people. Change in their (stakeholders') mindset.
- They should be given proper identification marks like certificates from the Government. NGOs should take good care of these areas.

- Vulnerability of the PWDs will be reduced if they are included into DRR activities since day one. This means that they should be included at the very nascent stage of the Programme-that is the planning phase.

After this presentation the audience split into five small groups. A separate topic was assigned to each Group. The Group members were supposed to identify the gray areas and suggest recommendations to solve those problem areas.

IV. Session III-Identification of gaps and recommendations for long term CBDRM planning

Chair: Dr. Joachim Schmerbeck

IV. 1. Immediate response - Group A

Members of the Group: Utpal Maity (SRAN), Debnath (UNDP), Paramita (JU), Fr. Pudumai (Social Welfare Institute, Raiganj), Samanta (Sagar Island), Giri (Sagar)

Gaps identified

1. Absence of a propositioning system

There is a lack of pre positioning of relief materials at the Panchayat level which delays delivery of the relief materials.

2. Slack relief committees

Relief committees wake up only at times of a disaster but at normal times they are not that active.

3. Faulty assessment in terms of needs

Difference in quality of relief materials or shortage of relief materials creates conflicts. This is also linked with the assessment of the need of the people. There is a bit of a gap in the distribution; while some people get the relief, the others are kind of waiting to see when the next lot of relief materials comes in. There is also a problem with the quality of the relief materials that is being delivered-be it food or clothing. First aid measures also lack sometimes.

4. No sharing of information

Lack of information sharing by the Government with other stake holders. This is also a gray area because the Government is hush hush about the provisions that are there for times of disaster. There is a lack of clarity and transparency.

5. Lack of co-ordination

Ineffective co-ordination among NGOs and GOs on information and data sharing. Every one collects a lot of data especially immediately after assessment. There is a lack of co ordination among the different players to share the information. Moreover there is faulty assessment and no proper up gradation of the old data as well as duplicate assessment of data. The Panchayat has got huge amount of data but there is no proper data management.

Recommendations

1. Panchayats

The Panchayat should preposition itself so that the delivery of relief materials is on time.

2. Preparedness all year

The relief committees should be in the habit of working all through the year. Through past experiences it is now quite clear that floods and cyclones are imminent.

3. Identifying needs of people

It is very important to identify the needs of the people. Care should also be taken to cater to the special needs of the people with disabilities. Broadly, the assessment should be an all inclusive one.

4. Information sharing

The information should be shared with other players. Without this a clear picture of the need is very difficult to ascertain. Up gradation of the data at regular intervals is important, otherwise the whole purpose of keeping a database turns futile.

5. Coordination

There should be co-ordination between the various Departments. This gives a systematic and professional approach to the risk reduction trusts. Duplication of efforts can also be avoided.

IV. 2. Linkage and networking between NGOs and different administrative levels - Group B

Members of the Group: Debashish Mitra (Civil Defiance Department, Kolkata), Ms. Kaberi Samanta (SOS), Dibakar Baidya (villager), Tapas Das (Sagar Island), Haripada Samanta (Member South 24 Pgs Zilla Parishad), Apurba Mondol (Sagar Mangal NGO)

Gaps identified:

1. Misappropriation of funds

According to the Panchayati Raj System, relief materials are supposed to be stocked by the subdivision. This is percolated down to the Block Development Officer. This often does not reach the hands of the lower rung that is the Panchayat. The Government has instructed the administrators to reserve 10% of the fund to combat disaster this is often not observed. If maintained, this fund can be used to keep the stocks of relief materials.

2. Lack of coordination between the various organisations

Often there is no knowledge about the number of people who are working. This creates a lot of confusion as no one knows their fellow workers. Since a common consensus can be drawn in terms of aims, it is of utmost importance to know the dispersion and specialized action areas of other organizations to save time and effort.

Recommendations

1. Absence of intermediaries

Arrangements should be made to cede the relief materials directly to the hands of the community in order to promote proper dissemination of funds.

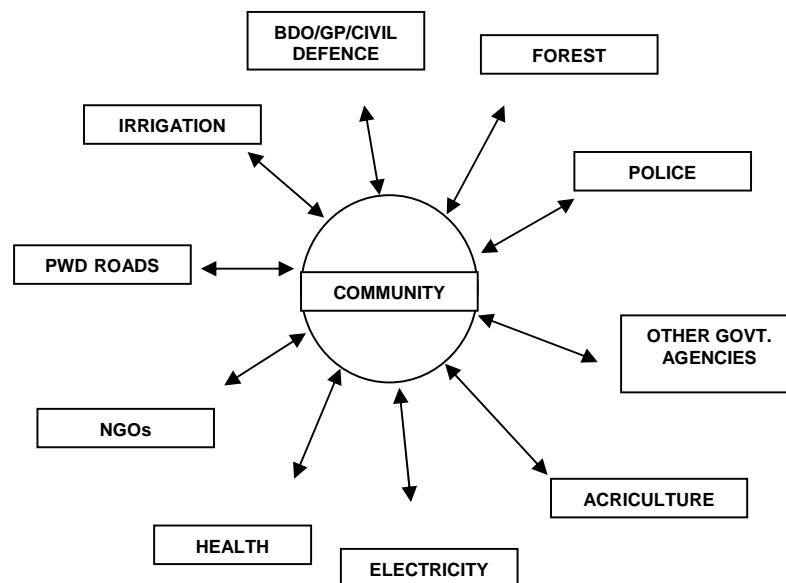
2. Proper documentation

There should be sound information about all the people who took to working in the disaster prone areas. A complete directory should be made as to who is working where. This should include both the GO s as well as the NGOs. There should be proper coordination. Synchronization of each one's work is very important.

3. Change in outlook

There should be a change in the outlook No rivalry between any Department is intended be it Government or other. One thing should be borne in mind that we are working for a common goal. Inter sharing of the information is a very important bet. The Government Departments including the health, irrigation, fire brigade etc should shake golden hands with the other grass root bodies.

Inter-relation between the various Departments



IV. 3. Long term livelihood restoration and strengthening of infrastructure - Group C

Members of the Group: Meghanad (Sambandh, Orissa), Sudeshna (?), Dr. Hoeper (Welthungerhilfe Delhi), Fr. Pradeep (Consultant in CBDP), Nandini Dasgupta (?), Sasanka (?), goutam (?), Dr. Pallab (?)

Gaps identified

1. Agriculture

In agriculture the gaps identified were saline water ingress, water logging and practice of mono crop due to lack of water or irrigation.

2. Embankment status

Construction and repairing work of the embankments is done in the monsoon months. So flood approaches in all gusto and the embankments fail to stand the test of time; they turn out to be very weak and loose. Since they are made up of earth, they are easily washed away by the flood. Moreover, they are made stronger on the riverside but on the land side they are weak. The soil for the embankments is mostly collected from the land side. This makes the crops on the land side all the more vulnerable. The quality of work is so poor that they fail to serve their purpose. As a result the embankments topple down very easily.

3. Insurance

The poor villagers are groping in the darkness. They do not know about the insurances that are there to be made available to them. There are many types of insurance plans like insurance of property, crop insurance etc. In other areas like Orissa and Bangladesh, there are proper insurance units. They counsel people on this. No compensation is there for the environmental refugees.

Recommendations

1. Rainwater harvesting

Rain water harvesting through ponds and practice of integrated agriculture. Sundarbans is fortunate to get a considerable amount of rainfall. In that case rain water harvesting is a very good option to combat water scarcity. Integrated agriculture can help the crops from getting the storm surges.

Dredging or desiltation of existing channels.

All the channels in Sundarbans should be desilted or made open. Many water channels in the Sundarbans are choked.

2. Land shaping-individual/community

Land shaping is a very good model in the Sundarbans which is working wonders in some of the places. This should be catered to both the fronts- be it at the individual level or at the community level.

3. Reintroduction of saline water resistant crops.

Lesson can be learnt from the Chilka lake. It is primarily a saline water lake. So saline water resistant crops are like a boon to these areas. Similar bets can be made available for the people in the Sundarbans as trial and error method in its initial stage.

4. Proper scientific research.

Proper scientific research should be carried out both at the central as well as the state level. Research at local levels should also be facilitated in order to find local solutions to the problem areas. Institutions need to be set up. NGOS can also come into the picture.

5. Conservation of biodiversity

Allied activities like goat rearing, horticulture and animal husbandary. Animal husbandry is given less priority and if this is gone, there is no alternative. One of the problem area is juvenile prawn catching. This should be stopped immediately because there is a huge loss of biodiversity in the process.

6. Big time community participation

Community participation in the construction of embankments. The right time for the construction of these embankments is not the monsoons but before the onset of the monsoons. This will be around December to March.

7. Area specific planning

Taking the views of experts and community. Planning should be done keeping in mind the demands of that area in particular. For example some areas will call for higher embankments than other areas.

8. Generation of more funds and resources.

In order to upscale the existing system, fund needs to be generated.

9. Road and infrastructure

Road and infrastructure needs to be given a massive facelift. Construction of multipurpose cyclone shelter is very necessary. Construction of model ponds and model houses are very much required. These should be replicated in other areas as well.

10. Insurance

The only suggestion that can be rendered here is policy level changes. Proper insurance measures should be rendered to the inhabitants of the pristine Sundarbans

IV. 4. Long term strategy to cope with climate change - Group D

Members of the Group: Mr. A. Naskar, Mr. B. Mahapatra, Mr. S. Goon , Sister Sampurnam (Palli Unnayan Samiti, Baruipur), Dr. G. N. Bhandari, Dr. S. Hazra (Director, School of Oceanographic Studies, JU) and Tanaya Ghosh (JU).

Gaps identified

1. Loss of Land

Sea level rise due to climate change is threatening more land and lives on the coast of Sundarbans. Erosion rate of 2 to 15m/year is showing a steady rise. The intensity and frequency of cyclones has also increased. Tidal & Storm surges under rising sea level condition cause extensive erosion, flooding of land and destroying houses and lives. The group pondered over the question whether these embankments can be a long term solution. Water level is on a steady rise due to the deposition of silt on the riverbed. The only good news there for the people of the Sundarbans according to Dr. Hazra is that the situation is out of control only during the monsoon months.

2. Embankments

Presently the West Bengal coast is guarded by 3520 km of embankment, about 800 km of which are vulnerable. Various materials like Earthen, Brick Pitched, Concrete (Beguakhali), Boulder gabion, Spur (Kakdwip) have been used to make the embankments, but reportedly all of these types have been found to fail. Reasons behind this are inadequate increase of the embankment height with respect to water level rise due to silting up of river beds. Water absorbed by the embankment during flood or water rise, increases pore pressure inside it making it unstable. Salinity of river water retards sheer strength of the embankment. People cut trees from embankment, pick up bricks and also remove wooden logs that support the embankments. Resistance from the village community in times of sapling plantation.

Recommendations

1. Coping with the frail embankments

Planting high yielding grass on the embankment can be a way to flush out the trapped or absorbed flood water. To protect the seeds of the grass from being washed away, biodegradable geo-jute can be applied on the fore-slope of the embankment. Experimental vertical pipes filled with coarse-grained sand can be bored through the embankment till the surface of the water table. Sand will absorb saline water, which causes a perpetual damage to the embankment. 1:2.5 (25°) slope of the embankment has to be maintained. Maintaining a free board (the height of the embankment above high tide line) of the embankment to cope up with the rising waters due to river siltation or sea level rise. River flushing can be another method but it is still much on the theoretical grounds.

Participative planning to relocate villagers from vulnerable zones and constructing higher embankment. There should be proper resettlement rehabilitation policy. The Government should start thinking from now on. If this is not done now, the people should be made to migrate forcefully in just five years time. Scientists found out that the local soil can best serve the purpose of the construction of embankments; it is the safest geo technically. The other option of transportation of soil from other areas for the construction of embankments is impossible for all practical purposes. It is very important to maintain the embankments when the villagers are not under threat. During the winter months and not the monsoons, the embankments should be reared by the local stakeholders and not the Government. There should be a sense of belonging in the minds of the villagers.

2. Proper awareness raising campaign programme and participatory approach to settle the gaps.

They should be made aware about the seriousness of the situation. It is "Now or never". It is a tendency amongst the local villagers not to leave the village unless the situation is beyond control.

3. The local stake holders should be incorporated in the vulnerability mapping.

Bridging the gaps between the Government, the experts and the NGOs. There might be a plethora of information with the NGO or the researcher but they seldom know where to go and how to make use of such information base.

4. Interchanging of past experiences

Experience sharing is the need of the hour. This needs to be done at an interstate level. For example the state of Orissa can share its experiences with that of West Bengal

IV. 5. Sustainability of CBDRM - Group E

Members of the Group: Dr. J. Schmerbeck (Welthungerhilfe, Kolkata), Suvasis Nath (?), Debabrata Giri (Ramakrishna Mission, Narendrapur), Rinku Gayen (?), Pallab Dey, Mahadev Maity (?), Bimalesh Samanta (Jadavpur University)

Gaps identified

1. Interest of villagers

Interest of the villagers not always there. It is transitory. They seem to be interested only when the project is reeling. As soon as the project gets over, people are seldom willing to take the task up and make it their own. Level of active participation is insufficient (lack of usefulness of learned skills).

2. Technical know how is in the communities

Insufficient technical know how. Lack of information flow and also the information is not updated. Lack of availability of material for example, life jackets. No or irregular training after project ends. The whole purpose is marred if there is no continuity.

3. SHG are included in the process of CBDRM and have a good link to Panchayat institutions

CBDRM is not institutionalised amongst SHG at village level

Link between SHG and Panchayat institutions are often missed.

4. Network for information flow and facilitation

Awareness of governmental institutions is often lacking. The Panchayats are not aware of CBDRM. One NGO doesnot know what the other is doing. There is no coordination of activity. Link between NGOs and local and governmental institutions / line departments underdeveloped. Link / coordination between NGOs is poor

5. Data knowledge exchange not in place.

There is a huge information at the Panchayat level, at the scientific level and at the NGO level. There should be exchange of information for a common goal.

Recommendations

1. Interest of villagers

Proof of preparedness in disasters situation helps. there should be a sound exchange of survival stories as the saying goes "seeing/hearing is believing". This will go a long way in kindling the hope of CBDRM in the minds of the poor villagers. Identifying leaders and training them will help.

2. Technical know how is in the communities

Training young people on CBDRM skills and soft skills is needed.

Ensuring availability of information from the Village Knowledge Centres can make a headway in this. Identifying sources for material and making them accessible can go a long way.

3. SHG must be included in the process of CBDRM and should have a good link to Panchayat institutions

SHG must be well organised and informed. SHG members are part of Panchayat forums (GS) so they can be a key player.

4. Network for information flow and facilitation

Forum of local stakeholders for administrative units (e. g. Sagar Island) is required. Exchange among NGOs on their activity in the field and respective coordination will improve flow of information. IAG and SDMA must coordinate activities at state level.

V. Summary of gaps identification and recommendations

Chair: Dr. B. Hoyer

Following the group work, presentation and discussions, the plenary focussed on consolidating and emerging issues and formulating recommendations for improving the situation of disaster preparedness in West Bengal. The plenum agreed that players in disaster preparedness should be involved and motivated to be proactive in the process. It was further agreed to differentiate between immediate and long term recommendations.

Immediate preparedness

Immediate response addresses the capacity to react and respond to disasters promptly at different levels. This includes the skills of everybody as well as a well planned and functioning infrastructure as well as the cooperation of the different organisations and persons involved.

The recommendations are therefore arranged according to "Relief and response" and "linkages".

Relief and response

The main responsibility for relief and response activity lies with the government. The resources that are allocated here should be utilised and capacitated for an effective mobilisation at the time of disaster.

- Exchange and coordination of the different departments in regular meetings and interactions.
- Further is it essential that information related to relief and response is shared with all administrative levels, especially with communities and families.
- Training and capacity building of PRI member together with capable members from the community and with a secure stock piling of relief material in the Panchayat.
- Intensive training and capacity building for the entire community and not only for already well established groups. Special attention as to be given to the most vulnerable sections of the population like women, children and persons with disabilities.
- In addition the community has to take responsibility to improve the village infrastructure like rising tube wells for safe drinking water.
- NGO's and INGO's should strengthen their own capacities and also focus on facilitating the capacity building and operation of local government institutions and the vulnerable communities at large To do this in an efficient manner coordination and sharing of information with other NGO's and government institutions is recommended.

- Involving academic institutions in the field of early warning, vulnerability mapping and identification and analysing other scientific aspects of disasters. The academia should aim at research topics that support the activities in the field and support the implementation of their findings on field level.

Linkages

- Regular exchange and sharing of information and experience, coordination and cooperation among government relief departments, different line departments, NGOs and communities
- Every stakeholder in the process needs to commit to this process while beside the information sharing the academia have a special role in facilitate or carry out the preparation and accessibility of information with the help of internet platform publications and dissemination events.
- On village level an infrastructure that enables information to reach out to all sections of the society needs to be established (e.g. village information centres for disaster preparedness)

Long term preparedness

Long term preparedness address all disaster related issues that go beyond the actual disaster event and the respond to this. Three important areas have been identified: livelihood restoration, climate change and sustainability of CBDRM.

Livelihood restoration

After a disaster it is often difficult for affected people to come back to a normal live especially if there assets have been destroyed.

- Development and application of disaster related livelihood measures like disaster adopted cropping mechanism and a significant improvement of the embankment situation.
- The government should support this development strongly with the help of NGO's and the academia while it is found that the knowledge on disaster related livelihood measures should be improved among NGO's.
- The academia are strongly recommended to intensify their research in this fields and get involved in implementation and training.
- Communities to be proactively encouraged and involved in experimenting with new agricultural technologies and get involved in the establishment and maintenance of sufficient elaborated embankments.

Climate Change

Climate change is a well referred issue today and its impacted on human lives on the entire earth is taken as a fact. Even though it is hard to predict the effects of climate change precisely it is more than timely to prepare for the consequences. Especially an area like the Sundarbans, naturally already subject to strong hazards, can be expected to be effected by climate change to the worse.

- It is of up most importance that the government face the assumed consequences of climate change and provide plans and funds to relocate people to safer zones. These plans should trigger down to the community and Panchayat Raj Institutions (PRI) as well as communities have to build up the capacity to participate in the planning process and to implement the foreseen action.
- NGO's are recommended to participate in the planning of coping mechanisms and preparedness measures, build their own knowledge and capacity under strong cooperation with the academia and conduct advocacy and awareness specified for the different groups in society.
- The academia should intensify their research on effects of the climate change on human life in the Sundarbans and cooperate here with international researchers, especially studies undertaken in Bangladesh. Findings should be shared with other actors in the field like NGO's and governments

Sustainability

Any preparedness work is wasted if the process does not continue after it has been started. This sustainability builds on the ownership of the CBDRM process of the family, communities and government institutions.

- Here again the sharing of information is important as well as the coordination between the Government and Inter Agency Groups. Information sharing and the establishment of a respective infrastructure is also needed on Panchayat level while the PRI should support the organisational DRR structure in the villages and develop mechanism to ensure DRR practices during times of transition like election.
- Within the communities point person should be identified who are capable to take ownership in the CBDRM process and are able to take it further on to the community and the families. This should be done through NGO's which also can take care for the information flow down to family level.
- The communities and families should strengthen their linkages to the Panchayat, participate in the process and while doing so focus on the most vulnerable among them.
- The role of the academia in the context of sustainability is to support the CBDRM process by making the information and technologies in the field of DRR accessible for communities and local government institutions.

The above recommendations have also been detailed in a matrix below:

RECOMMENDATION MATRIX
 Formulated at the State level lessons learned workshop
 At Ramakrishna Mission Ashrama on 19th and 20th Novener 2008

	Govt. State / Dist./ Block	PRI	Community / Families	NGOs / INGOs	Institutions / Academia
Immediate response					
Relief and Response	<ul style="list-style-type: none"> • Identification of existing shelters and shelter construction sites on elevated locations that are accessible for all in every village • Establishment and maintenance of stable and functional link roads • Convergence of different line departments of block and district administration for effective response and their regular meetings/interactions • Information sharing with NGO s, PRIs and community members for effective access to immediate relief • Training and capacity building of block and district level officials on immediate response 	<ul style="list-style-type: none"> • Stockpiling of relief material at Panchayat level at secured locations • Establishment of grain stocks at identified secure locations • Training and capacity building of PRI members and select community members for immediate response 	<ul style="list-style-type: none"> • Identifications of location for rescue and storage (grain storage) • Training and capacity building for all • Training of Families in the preparation of Family Survival Kits & Child Survival Kits • Setting up emergency response Task Forces • Involvement of Self Help Groups (women) in disaster management • Taking up responsibility to improve village infrastructure like raising of tube well at a higher location in every village 	<ul style="list-style-type: none"> • Coordination and information sharing among the NGO's and with government institutions • Preposition to support relief and response activities 	<ul style="list-style-type: none"> • Involvement of the academicians in early warning system, vulnerability mapping ,and identification and analysing of important backgrounds • Accessibility of information and information sharing • Linking of the academic work with field level implementation

Linkage	<ul style="list-style-type: none"> • Effective coordination , communication at all levels for information sharing • Flow of information between all • Disaster management department and IAG to develop web page on disaster management 	<ul style="list-style-type: none"> • Effective coordination , communication at all levels, sharing of information 	<ul style="list-style-type: none"> • Establishment of infrastructure that allows information sharing from village to village and from village to government 	<ul style="list-style-type: none"> • Establishment and facilitation of linkages between communities and PRI as well as line departments 	<ul style="list-style-type: none"> • Effective coordination, communication at all levels, sharing of information • Establishment of internet platform to support information forum and discussion • Joint events like workshops and conferences
Long term preparedness					
Livelihood restoration	<ul style="list-style-type: none"> • Intensified efforts towards developing cropping systems which can withstand disasters • Development of measures and procedures to establish and maintain better embankment s 	<ul style="list-style-type: none"> • Assess the needs together with NGO's • Becoming proactive in finding and implementing solutions 	<ul style="list-style-type: none"> • Need to be mobilised for active participation in DRR activities • Taking actively part in the embankment management • Trial and implementation of new agricultural system • Vulnerability mapping at community level with the task forces 	<ul style="list-style-type: none"> • More interaction and engagement with the academicians • Support of embankment work through close cooperation with communities as and government departments • Building up capacity among NGO's in disaster related livelihood measures like adapted cropping system 	<ul style="list-style-type: none"> • Involvement of the academicians • Intensify the research on identification of agricultural system adopted to disaster • Intensify research on improved embankment technology and maintenance • Training communities in newly developed technologies and findings • Building a strong database on information on embankments.

Climate Change	<ul style="list-style-type: none"> • Develop plans and provide funds for relocation of people from vulnerable areas to safer zones (long term) • Micro level topographic mapping, closed grid surveys to identify vulnerable areas 	<ul style="list-style-type: none"> • Develop plans on how to cope with disaster and climate change scenario • Building up at least the capacity to implement this plans 	<ul style="list-style-type: none"> • Participation in planning mechanism • Building capacity to implement plan • Identification of higher and low areas for vulnerability and risk zone 	<ul style="list-style-type: none"> • Participate in the development and implementation of coping mechanism and preparedness plans for climate change scenario • Capacity building on climate change consequences and adaptation measures together with academia • Advocacy and awareness raising on the impact of climate change and coping measures 	<ul style="list-style-type: none"> • Linkages with international research institutions, especially with the research in the Sundarbans of Bangladesh • Support the micro level topographic mapping • Support NGO's and government to implement findings
Sustainability	<ul style="list-style-type: none"> • Ensuring availability of information to all • Coordination among SDMA / IAG • Mainstreaming disaster in school curriculum 	<ul style="list-style-type: none"> • Support the organisational structure built up for DRR in the villages • Develop mechanisms to ensure DRR practices during periods of transition eg. During elections and following elections 	<ul style="list-style-type: none"> • Strengthening of CBOs and the linkage with the Panchayats • Special focus on the most vulnerable people and poorer of the poor • Participatory planning forum, 	<ul style="list-style-type: none"> • Identification and training of the leaders for ownership of CBDRM • Ensuring availability of information to all 	<ul style="list-style-type: none"> • Making of information and technologies accessible for communities and local government