

FACING SUDDEN IMPACT

(Experience of Orissa Super Cyclone of 1999)

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Abstract: Orissa has a long history of cyclones. Devastation and death toll were very high during 1999 super cyclone. The response to the cyclone in India and from abroad was also tremendous. The objective of this paper is to assess the activities of the government and NGOs providing relief, rehabilitation and reconstruction in aftermath of the Orissa super cyclone. Whatever the mismanagement in relief and rehabilitation measures, credit must go to the state government for controlling the spread of any epidemic and preventing any starvation death in the affected areas. Relief operations of local NGOs through ODMM and the state government and rehabilitation measures by OSDMA helped a great deal. The role of international bodies such as UNICEF and UNDP in relief and of INGOs in rehabilitation, mostly construction of houses, supply of nets and boats to fishermen, and mamata grahas for women and destitutes has been innovative and praiseworthy. Most of the cost of rehabilitation was borne by the government. Participation of local communities including PRI institutions in relief, reconstruction and rehabilitation and in all stages of disaster management is necessary. Forest cover over sand dunes, construction of more multi-purpose cyclone shelters, one kilometre wide protective shield near the seashore through afforestation are some of the important steps yet to be taken. However, provision of safer houses for the affected people is the first and foremost requirement.

In the last decade (1992-2001), losses due to natural disasters have averaged about US\$ 65 billion a year. Ninety-four per cent of the world's major disasters during 1990-98 took place in developing countries, according to World Bank's *World Development Report 2000-01*. However, these countries have made fewer efforts than the developed countries to adapt their physical environments to mitigating the impact of natural disasters or to insure themselves against the risk of disaster (Freeman, Keen and Mani: 2003). Twenty-four of the 49 poorest countries face a high level of disaster risk. Loss of life is far greater in the developing countries. Within these countries, the poor are more likely to suffer from the rich.

A disaster is a serious disruption of the functioning of a society, causing widespread human, material and environmental losses, which exceed the ability of the affected society to cope with using its own resources. The Brussel-based Centre for Research on the Epidemiology of Disasters (CRED) defines a natural disaster as a situation or event that overwhelms local capacity, necessitating a

request for national or international assistance (F&D: 2003). For a disaster to be entered into a CRED's emergency events (EM-DAT) database, at least one of the following criteria must be fulfilled: (i) 10 or more people reported killed, (ii) 100 people reported affected, (iii) a call for international assistance, or (iv) declaration of a state of emergency. It is usually classified into two groups viz, natural and man-made; and natural disasters are further divided into three categories: (i) sudden impact disaster (e.g. cyclone, tsunami), (ii) slow-onset disaster (e.g. drought) and (iii) epidemic disaster (e.g. SARS).

A natural disaster like a cyclone is sudden and powerful, though there is sometimes an element of warning. It is often predictable to some degree: but it is not seen as controllable. Such events are even described as 'acts of God'. A natural disaster causes visible damage to a familiar environment. There are economic losses besides psychological disturbances due to bereavement. The term 'cyclone' is derived from the Greek word *Kykloma* meaning the coil of a snake. A cyclonic storm transfers its whirlwind movement to seawater. When the storm approaches a coastal belt, the sea level rises rather suddenly to an overwhelming extent causing dangerous inundation of the coastal areas. (Shiva and Emani: 2000).

Cyclones in Orissa

Orissa, an eastern coastal state of India, has a long history of cyclones. Throughout the 19th century, Orissa suffered from a series of heavy cyclones, mostly during September-November and, the worst sufferer was Balasore district. Major cyclones before independence, were, one on 22nd September, 1885, (with a loss of about 5,000 human lives), another on 31st October, 1931, (which killed about 20,000 human beings mostly in Balasore), and two in October and November, 1942. The British Government took some measures to redress the sufferings of the people but that was meagre, considering the requirement. They did not take any long-term measures to protect the people from the severity of the cyclones (Bhatta: 1997).

Since independence, the state has faced two severe cyclones, one in 1971 and, the other in 1999. The 1971 cyclone struck at midnight on 29th October. It hit the inland with a gathered speed of up to 175 km per hour and wrought havoc over vast areas destroying crops, and blowing off roofs over 8,214 sq miles in the districts of Cuttack, Balasore, Puri, Mayurbhanj, Keonjhar and Dhenkanal. More than 10,000 people died. The worst sufferer was the erstwhile undivided districts of Cuttack particularly Mahakalapada block (which, at present, falls in the newly

formed Kendrapara district). In the then Cuttack district alone, 5,20,438 houses were damaged, and 33.04 lakh people were affected in 38 blocks and six ULBS spread over 7,310 sq km. Over 6,065 sq km of cultivated area was affected and, crops over 3,788 sq km were damaged. About 7,397 human lives were lost and 77,921 head of cattle were killed in the district due to the high tidal wave and devastating storm (GoO: 1996).

1999 Super Cyclone

During 1999, cyclone hit Orissa twice within a period of two weeks. The first cyclone on October 17-18, affected mostly two districts, viz. Ganjam and Gajapati. However, the worst affected district was Ganjam, where there were more than 150 human casualties. The second cyclone, which came on October 29-30, affected 12 districts, the most-affected being Jagatsinghpur, where 8,119 human casualties were reported¹. The second one was so severe that it was termed a super cyclone.

The 1999 super cyclone moved with a speed of about 260 km per hour. As many as 128 blocks, 46 urban local bodies, 2399 GPs and 17,933 villages with a population of 1.9 crore were affected. About 10,092 human lives were lost, 18.97 lakh houses were damaged and 21 lakh ha of agricultural land was affected. The loss of cattle was more than three lakh. However, the estimate of loss and damage by the government varied from time to time. Over 90 per cent of the school buildings, dispensaries, offices, government buildings and roads in the rural areas were destroyed

Plenty of warnings were given about the approaching cyclone by the government. Block and district officials made efforts in many areas to warn the people through loudspeakers besides warning over the radio and television. The warning reached even the remote villages. But the people did not take these warnings seriously for various reasons. The impact of the warning was also lessened by the fact that 12 days before the people throughout the coastal belt had been warned of a cyclone which had affected only Ganjam and Gajapati districts. Moreover, the cyclone warning was not un-ambiguous, creditable and specific. When in doubt, the people stayed home.

The institutions, which people relied on for immediate assistance after the super cyclone were themselves initially its victims. Many NGOs found it difficult to respond quickly. The state government ceased to function effectively. Orissa had a woefully inadequate infrastructure for saving lives during cyclones. For

instance, Orissa (whose coast line is around 40 per cent of Andhra Pradesh's) had 23 specially constructed cyclone shelters in October 1999 compared to 1,041 in Andhra Pradesh (Dhara: 2000). Orissa's Emergency Plan for natural disasters like cyclone is available in two documents, viz, The *Orissa Relief Code* (ORC), and the *District Contingency Plan*. But the ORC concerns itself more with post-disaster relief modalities, than with handling emergencies.

Around 20 INGOs, 20 national level NGOs, 100 state level NGOs, 49 PSUs and 12 states had participated in the relief and rehabilitation operations. The international response was tremendous. The role of international bodies like UNICEF and UNDP in relief and of INGOs particularly DEC Agencies in rehabilitation particularly in the construction of houses, supply of nets and boats to fishermen, and Mamata Gruhas for women and destitutes is innovative and praiseworthy².

Relatives were the first to reach the affected villages in the most affected areas. Relief first reached from the government. However, there was no coordination among the NGOs, and between NGOs and the government during the relief and rehabilitation operations. Whatever the mismanagement in relief and rehabilitation measures, credit must go to the state government for controlling the spread of any epidemic and preventing any starvation deaths (Samal, Meher and Panigrahi: 2003).

However, the Army, the Navy and the carried out rescue operations soon after the cyclone and distributed emergency relief in the interior villages. They cleared roads and supplied food packets. There was airdropping of food material by the government from helicopters, just four or five days after the cyclone. There was an unprecedented response to the super cyclone in India once the scale of the disaster was known through the media, particularly the electronic media. The total amount of resources raised for cyclone relief and rehabilitation by various state governments, corporate bodies, PSUs, municipalities, NGOs, employees within India was significant.

. Besides relief, the state government also provided a variety of rehabilitation support such as ex-gratia payment to the next of kin of the deceased, financial assistance for damaged/washed out houses, loss of fishing equipment, betel vines and other income-generating assets, subsidised seeds for cultivation, PDS rice at concessional rates, waiving of school and college fees, compensation for crop insurance, supply of house building material, utensils, FFW programme and others.

Observations

Women: Women are the worst sufferers during natural disasters. Their vulnerability arising from their precarious social status, limits their access to resources, and information. Factors such as poor political participation of women, gender insensitivity, discriminatory governance, skewed economic entitlements of women result in their being the worst sufferers in a disaster situation. Some of their vulnerabilities are (Behera et al: 2002): (i) The loss of sources of income such as livestock, kitchen garden usually controlled by women further erode their economic status. (ii) The collapse of physical space (shelters) and subsequent social dislocation further increase women's vulnerability to sexual exploitation. (iii) The responsibility of moving essential items together such as dry food, clothing, infant needs, watching over children (who are all the more curious and anxious to move out of the house and thereby increasing risk substantially), feeding and child care, etc are some of the jobs the women are engaged in. (iv) Traditional clothing such as saree is not the best garment to be in when a person is trying to move faster and get saved and yet this is what most of the women in the state wear. (v) Once in safe houses, women particularly pregnant women face the problem of congestion and are put to grave risk. (vi) Prolonged confinement creates added problems in terms of unavailability of private space to be able to meet bodily needs. Women who are menstruating find the situation particularly difficult.

Women were not specifically a target group for relief assistance after the 1999 cyclone. Of course certain women and children were considered vulnerable and therefore, were targeted for assistance. The most noticeable relief targeted to women regarded as vulnerable was distributed through Mamata Gruha shelters. Many agencies supported the setting up of Self Help Group (SHGs) for women after the cyclone. The main objective of the SHGs was to provide income security through income generation activities, saving and credit schemes. (INTRAC: 2000).

Mamata Gruhas were built in villages where there was a large concentration of people who had been orphaned and made destitute. Action Aid took overall responsibility for about 35 such shelters in Ersam block and also supported two local NGOs (viz, Nature's Club, Open Learning System) for nine similar shelters in other areas particularly in Puri district. The other DEC agencies involved, though to a lesser extent, is SC (UK). The 44 Mamata Gruhas which were established in December, 1999, provided shelter to 801 orphans and children at risk, 638 widows, and 201 old people.

Poor: Twenty-four of the 49 poorest countries face a high level of disaster risk. Loss of life, moreover, is far greater in the developing countries. Within the developing countries, the poor are more likely to suffer. First, they often live in areas especially vulnerable to destructive natural disasters. Secondly, by disasters can severely depress the food production of the rural poor. Thirdly, even a small reduction in income has a dramatic impact on the poor, their savings are unlikely to be adequate in the event of large-scale or multiple catastrophes, and they may be forced to sell real assets such as agricultural land and livestock. Finally, the poor are less likely to have access to risk-sharing mechanisms such as insurance (Freeman, Keen and Mani: 2003).

The state government and other agencies had taken some steps to provide shelters to the affected people more particularly the poor. Immediately after the cyclone, most families received tarpaulins or plastic sheets (in some cases corrugated iron sheets) from different NGOs, corporate bodies and government sources. Of course, at the first instance, just after the cyclone, house building assistance was paid at the rate of Rs. 3,500 for a house that was fully washed away, Rs. 2000 for a fully collapsed house and Rs. 1000 for a partly collapsed house. By June 30, 2000, Rs. 270.65 crores was disbursed for house building assistance (Govt. of Orissa: 2002).

Under the DEC approach, CAFOD, British Red Cross Society and CARE undertook housing programmes. The total number of houses constructed by NGOs and donors till December 2002, was 4641 and 370 were in progress (Kanungo: 2002). In Ersama block which was severely devastated, 3,206 houses were constructed by various NGOs.

Some of the beneficiaries questioned the quality (poor roof, floor and wall) of 63 houses constructed by the Red Cross Society of Orissa which leased out the work to two NGOs, AWARE and Vikash in Khuranta village of Ersama block. The beneficiaries also complained that they were not allowed to participate in the construction process as the NGOs which acted as contractors brought labourers and masons from outside the district. On the other hand, Advancing Message of Gospel (AMG) India with financial assistance from WOORD and DAAD of Holland and WORT and TAI of Germany undertook the responsibility of constructing 300 houses, each unit costing Rs 39,500, particularly for fishermen in Marichipur village of Balikuda block of Jagatsinghpur district. A tri-partite body consisting of AMG India, its contractor, Kaveri India Construction Ltd and the beneficiaries was set up to supervise the work. The villagers were not satisfied with those progress and quality of the work (poor wall and roof) when they

compare their houses with that constructed by Tata Relief and Bharat Seva Sangha (BSS) in other villages. Surprisingly, six years after the 1999 cyclone, no one in Dhobei village has received any residential house from any agency, though it was severely affected by the cyclone.

Of course, these organisations faced various problems in constructing these houses, viz, (i) problems of transport, (ii) unavailability of trained masons, (iii) variation in the cost of material from planning to implementing stage, (iv) delay due to monsoon, (v) delay in execution due to low margin for the contracts, etc (INTRAC: 2000). The state government also faced the same problems in supplying IAY houses through the BDOs.

As government reports, houses of 19 lakh families were devastatingly damaged by the cyclone. Of the 19 lakh damaged houses, nearly 7.75 lakh were either washed away or had collapsed fully. (Besides the provision of six lakh houses under the Indira Awas Yojana for the people below the poverty line, an additional provision of one-lakh houses was available under the scheme from Government of India after 2001 flood affecting the same cyclone-affected areas plus other areas).

The construction of Indira Awas Yojana houses was done by the state government on a massive scale, in a phased manner. The beneficiaries were selected by the draw of lots from amongst the BPL families whose houses had either been washed away or fully collapsed. There were complaints that it was not possible to get a grant under IAY unless a commission of Rs. 2,000 to Rs. 3,000 was paid to the local power brokers. So the female and dalit households were at the receiving end of this grant process. Again, the non-availability of construction materials, hence, manipulation of material prices, prevented the completion of these houses in time and within its stipulated budget of Rs. 22,000. So works on many houses under the IAY was stopped either at the plinth level or at roof level (Samal: 2003). It was also observed that a majority of these houses were not being utilised by the people for residential purposes. Single room structures with a concrete roof (in some cases without doors and windows) were used as animal sheds, store houses or were not utilised at all. People lived in the mud-walled thatched houses. It is to be mentioned that most of the IAY houses were completely damaged by the 1999 super cyclone. There were various other problems in the allocation of IAY houses. The way BPL (Below Poverty Line) persons were identified in the state in 1997, many doubts could be raised on the fairness of the process of selection.

In the developing countries, more than three-fourths of the houses are constructed with clay mud, unburned clay blocks and bricks, field stones, etc and, hence, these houses are more likely to collapse in a cyclone or a flood (Arya: 2003). Thus, these weak-structured shelters supposed to protect its residents often end up killing them during cyclones and floods. Most of the people killed were living in mud-walled thatched houses when the 1999 super cyclone struck the flat low-lying area of Ersama block. Therefore, the first and foremost step in disaster management is to make the existing dwelling houses safer, in order to reduce the damage and also the number of casualties in a sudden natural disaster such as a cyclone or a flood.

Food For Work programme by the government and various NGOs has played an important role in rebuilding village and community assets and saving many people from starvation after the relief period. This has also helped the affected people regain their self-confidence after the trauma. Ninety-eight multi-purpose cyclone shelters (MCS) constructed within 10 km of the high tide level of the Bay of Bengal covering six coastal districts of the state will help the poor a lot in a storm provided the warning is given properly. But, the respondents in one of our studies (Samal: 2003) expressed anguish over the lack of cyclone shelters in vulnerable villages like Sankha, Dahibara and Dasamatha where more than 100 people were killed in each village in the 1999 super cyclone. Since the vulnerability of these villages, which are right on the sea-coast, is high, it makes the residents of these villages dissatisfied and disgusted with the rehabilitation and reconstruction programme. Inaccessibility and near non-existent transport facilities may be one of the major reasons for MCSs not being constructed. The other factor may be that the settlements are situated in prohibited areas.

For the payment of ex-gratia grant to the next of kin of the deceased (due to the cyclone), Rs. 25,000 from the Natural Calamity Fund of the state government and Rs. 50,000 from The Prime Minister's Relief Fund were earmarked, making a total of Rs. 75,000 for each recipient. About 4,558 persons (next of kin of the deceased) out of the 8,479 dead were eligible claimants of ex-gratia payment as per the order of the Human Rights Commission. Among them, only 4,518 heirs have received the ex-gratia payment. The amount of the ex-gratia payment is deposited in a scheduled commercial banks for a lock-in period of three years. Only the interest is paid every month for the maintenance of their families. The interest received by the affected families played an important role and acted as a regular source of income for these needy families, particularly women-headed,

poor and dalit households; and has lessened their future vulnerability. However most of the respondents complained that the investigating officers including PRI members demanded a bribe of Rs. 2,000 to Rs. 5,000 to settle each death claim. (Samal: 2003). There should be clear, specific guidelines regarding the ex-gratia payment and that should be conveyed to the village community. A specific role should be given to the Gram-Sabha to settle death cases. More decentralisation and transparency are required in this regard.

However, no effective rehabilitation measure was taken for artisans particularly weavers, carpenters, blacksmiths and potters to reequip them with income-generating assets which they lost in the cyclone.

Fishermen: As per the latest estimate, 29,818 boats and 59,174 nets were destroyed by the super cyclone. Two different DEC (Disaster and Emergency Committee) agencies (CARE and CAFODE) supported the rehabilitation of fishermen and Christian Aid's partner, VHAI, also supported replacement of boats with funds from the Prime Minister's Relief Fund³. These agencies have provided help in the form of boats and nets to a group of fishermen, usually three to five, with a certain percentage of the cost of boats and nets coming as a grant.

The rehabilitation of fishermen by CARE improved the relationship between the Fishery Department and the fishermen but there were some problems. First, the rehabilitation efforts of CARE did not consider women-headed families that survived by selling dried fish. Second, the advantages and necessity of insuring the boats was not accepted by the community. Third, before giving boats to fishermen's groups, the ownership pattern of the boats before the super cyclone and their level of indebtedness were not studied properly. The ownership of a majority of the boats was not with the fishermen themselves. Either the boats were owned by a fish merchant of Paradeep or Cuttack. Even the fishermen who owned boats were highly indebted to moneylenders (INTRAC: 2000). Fourth, fisherwomen whose husbands died in the cyclone were not given boats and nets, assuming that they could catch fish, using a net and boat. Fifth, people from other castes who were fishermen by occupation, and not by caste, were excluded.

Financial assistance worth Rs. 5.11 crore worth distributed among 15,306 families at the rate of Rs. 3,000 per boat for 9,417 non-mechanised boats (marine sector) and at the rate of Rs. 1,500 per net for 15,211 nets (marine sector) by the state government. For the inland sector, financial assistance worth Rs. 6.16 crore was disbursed among 30,163 families of Rs. 3,000 per boat for 10,154 boats and at the rate of Rs. 1,500 per net for 20,776 nets.

Since different agencies were supplying nets and boats, uniformity of price and quality was not maintained. In this case, some complains were observed

during our field study (Samal: 2003): Low quality material was used in the boats. Since local carpenters and other manpower were not used for making these boats, as the agencies hired outside manpower; the cost of the boats increased, and local wage employment opportunities were blocked. Since the fishing nets were purchased from outside market, they could not fulfil local requirements properly. Only a small fraction of landless dalit families who had been earning their livelihood through fishing for decades were benefited under this programme. Most of them were excluded from the list of beneficiaries, as the government did not recognise "fisherman by occupation". Women-headed households did not benefit much from this programme. No compensation was given for the loss of capital in dry fishing. (Samal: 2003). The grant (from the Centre to the Fisheries Department to provide boats, nets and other equipment to the cyclone-affected fishermen) did not reach the actual users and many bona fide cyclone victims were left out. A major portion of the grant remained unutilised.

Local community: Certain areas are affected by recurrent natural disasters. But, relief, reconstruction and rehabilitation carried out after one calamity do little to protect these areas from subsequent disasters. Reconstruction work is largely ad hoc in nature. Various stakeholders in areas prone to natural disasters like cyclones are not able to learn from past experience, which has led to a vicious disaster-poverty cycle (Sharma, Gupta, Bajaj and Shaw: 2003). Various types of stakeholders in a disaster who are involved in the relief, rehabilitation and reconstruction process are local communities, NGOs, government functionaries at various levels, international bodies, emergency services, religious groups, corporate bodies, public sector undertakings, associations, voluntary organisations, social activists, political parties, intellectuals, research scholars and similar other groups. However, local communities are the first to respond. Therefore, they should form the core of any disaster preparedness and mitigation effort.

In a majority of disasters, some local people who are unaffected or little affected are the first to recover. They attempt to rescue the affected people, using the available but scarce resources. Most of the rescue work is attended to in the first twenty-four hours. In addition, depending on the situation, relief work is also organised by the local people who are relatively unaffected. It is only subsequently that the government machinery, development and relief personnel enter the scene. Once this happens, the dimension of disaster mitigation changes. (Reddy *et al*, 2000). Outsiders who come forward from the nearby areas as sympathisers do

conduct relief, rescue, search and retrieval operations. Soon, they become a source of concern than help, because they too have utilised their scarce resources and they cause inconveniences such as overcrowding, spreading rumours, spreading infections, etc (Dharmaraj: 1996). Thus, ultimately, the local people are left to fend for themselves.

Viewed against this background, there is greater need for local mobilisation and organisation. The Tenth Five Year Plan document also emphasizes the need for community level initiatives in managing disasters including a suggestion that at least 10 per cent of the Plan funds at the national, state and district levels be earmarked and apportioned for schemes relating to natural disaster (GOI: 2002). Various studies (Okazaki and Shaw: 2003; Sharma, Gupta, Bajaj and Shaw: 2003) stressed participation of the local people in tackling the risk of natural disasters. The first step in this regard is to motivate local decision makers and policy makers. Representatives of panchayati raj institutions must not be excluded from local disaster committees. Empowerment of the local people as well as PRI institutions is an essential condition for successful disaster management so as to reduce the loss to property and lives.

The experience of the 1999 super cyclone shows that the community and the affected people were very much effective in rescue and relief work during and after the cyclone. Community participation and effort is necessary not only in rescue and relief operations. But in the all stages of cyclone disaster management, since social mobilisation is only possible through community participation. But, in the rehabilitation and reconstruction efforts after the 1999 cyclone, the community was not consulted either by the NGOs or by the Government.

Of course, OSDMA and the UN have made a community contingency plan for flood and cyclone in Orissa after the experience of the 1999 super cyclone (OSDMA and UN: undated). A community contingency plan (CCP) is a list of activities a village agrees to follow to prevent loss of life, livelihood and property in case of a cyclone or flood. It also identifies in advance, action to be taken by individuals in the community so that each one knows what to do when a cyclone or flood warning is received. Every village is different in terms of its inhabitants, its geography, its resources and its way of taking community decisions. Therefore, the contingency plan will differ from village to village. A community contingency plan has to be made by the inhabitants of the village. As per the guidelines, the plan is to be made in five stages; viz, (i) review and analysis, (ii) situation analysis, (iii) hazard mapping, (iv) risk mapping and (v) opportunity mapping⁴.

The guidelines give a good and appropriate piece of advice about what is to be done before, during and after a cyclone or flood. In some areas of Kendrapada

district, CCPs are active and, they played an effective role during the 2003 floods. But, in Jagatsinghpur district, the CCPs are yet to be activated.

Expert Committee's Suggestions

To study the various aspects of 1971 cyclone in Orissa, the Central government appointed a committee under the chairmanship of P Koteswaram, and the state government of Orissa, set up a committee under the chairmanship of M C Pani. The major suggestions of the two committees were (i) a one kilometre wide protective shield near the seashore through afforestation, (ii) construction of cyclone shelters, (iii) sand dunes to be given forest cover, (iv) dwelling houses on high foundations, and (v) deep tube wells in high tide-affected areas⁵.

But most of the government officials are not aware of these reports. Nor has the government tried to implement some of the suggestions of these committees. Rather, the government has gone against the suggestions by encouraging shrimp culture and hotel industry in the coastal belt, and human settlement in prohibited areas to create a vote bank, thus destroying mangrove forests and sand dunes which founded nature's own defence system. Even IAY houses are not built on high foundation.

The interplay of various physical, socio-economic and political factors determine a population's vulnerability and also its ability to respond to the challenge. Knowledge and better understanding of the main coping strategies is useful in setting the priorities for public programmes and safety nets (Skoufias: 2003).

One can also learn from the affected people's own natural and spontaneous coping strategies during and just after the 1999 super cyclone, and take necessary measures in the future disaster management plan. It should be mentioned that we did not find any difference in natural and spontaneous coping strategies of various categories of households, dalit, non-dalit, women-headed or male-headed households. We observed that the affected people were able to save their lives during the 1999 super cyclone due to various coping strategies (Samal: 2003). For food, they depended mostly on green coconut (also for drinking water), papaya (*amrutabhandā*), and plantain/banana to save themselves from starvation. This helped a lot in checking an epidemic. Those who were in cyclone shelters had to rely on dry food, particularly pressed rice (*chuda*) and puffed rice (*mudhi*). Many could save their lives from high tide by catching hold the bamboo bush, kewada bush, cashew plants and staying on sand dunes. Thus, from these natural and spontaneous coping strategies of the affected people during the 1999 super

cyclone, one can learn that it is advisable to have, besides mangrove forests coconut trees, papaya and banana plants, bamboo, kewada and cashew plantations. The community should also see that the sand dunes and the forest cover over it are maintained. Airdropping of food material, opening of community kitchens just after the cyclone and the Food-for-Work Programme helped save the affected people from starvation and to boost their morale after the trauma. This fact may also be kept in mind while preparing disaster management plans.

Knowledge and better understanding of the main coping strategies is very useful in setting the priorities for public programmes and safety nets. In view of this, one of our studies (Samal: 2003) tried to find out what the affected people suggest to meet this type of disaster, that is, what should be the coping strategies, before, during and after a cyclone. They have suggested a number of measures. Some of the important ones are: (i) unambiguous and specific warning by government agencies before a cyclone, (ii) moving to cyclone shelters and storing dry food before the cyclone, (iii) opening of free kitchens, disposal of carcasses and corpses, provision of medical treatment and drinking water just after the cyclone, (iv) launch of FFW programmes and reconstructing and repairing the damaged houses and infrastructure in the post-cyclone period, (v) construction of multi-purpose cyclone shelters, massive plantation and afforestation programme in the coastal belt and training of people in disaster management as medium and long-term rehabilitation measures.

The suggestions by the grass-root people who were actually affected by the killer cyclone should be taken into account while preparing any plan for disaster management. The plan should be from below, and certainly not from above.

Summary and Conclusion

Orissa has a long history of cyclones. Since independence, the state has faced two severe cyclones, one in 1971 and the other in 1999, incidentally both on 29th of October. Devastation and death toll were very high in the 1999 super cyclone. The response to the cyclone in India and from outside India was tremendous and unprecedented once the scale of the disaster became known through the media, particularly the electronic media. Just after the cyclone, the state government ceased to function effectively. Whatever the mismanagement in relief and rehabilitation measures, credit must go to the state government for (i) controlling the spread of any epidemic and (ii) preventing starvation deaths in the cyclone-affected areas. The preparedness of the state government to face sudden-impact natural disasters like flood and cyclone has increased dramatically after the experience of 1999 super cyclone. Relief operations of local NGOs through

ODMM and the state government; and rehabilitation measures by OSDMA have been of great help. The role of international bodies like UNICEF and UNDP in relief and of INGOs particularly DEC Agencies in rehabilitation mostly in the construction of houses, supply of nets and boats to fishermen, and Mamata Gruhas for women and destitutes is innovative and praiseworthy. Though, there were some problems of coordination, the rehabilitation and reconstruction measures have progressed satisfactorily. A major portion of the cost of rehabilitation is borne by the government. Airdropping of food material, opening of community kitchens just after the cyclone, Food-For-Work Programme and ex-gratia payments have helped much in saving the affected people, particularly poor, dalits, from starvation and to enable them to regain their self-confidence and boost their morale after the trauma. These facts may be kept in mind while preparing disaster management plans.

Participation of local communities including PRI institutions in relief, reconstruction and rehabilitation and at all stages of disaster management is necessary. Sand dunes and the forest cover over it, construction of more multi-purpose cyclone shelters, and one kilometre wide protective shield near the seashore through afforestation are some of the important steps yet to be taken.

However, most of the people killed were staying in mud-walled thatched houses when the super cyclone. Hence, provision of SAFER HOUSES for the affected people is the first and foremost requirement to face sudden impact natural disaster like cyclone.

Endnotes

¹The twelve districts affected are Puri, Cuttack, Kendrapada, Nayagarh, Khurda, Bhadrak, Keonjhar, Dhenkanal, Jagatsinghpur, Jajpur, Balasore, and Mayurbhanj.

²DEC Agencies include Action Aid, British Red Cross Society, CAFOR, CARE, Christian Aid, Concern, HTA, HAI, OXFAM, SC(UK), and World Vision UK

³CARE has provided one boat and a net to a group of five fishermen in the former block and one boat to a group of three in the latter block. Around 826 boats were supplied by CARE. The cost of the boat was Rs 9,000 and that of the net Rs 6,000. Out of the total cost of Rs 15,000, CARE provided Rs 11,000 and the beneficiaries Rs 4,000. Beneficiaries were chosen on the basis of those in actual possession of boat by the fishermen at the time of Super Cyclone. Project Aparajita provided one boat and net to a group of five fishermen which was provided with boat and net worth of Rs 16,000, 50 per cent of this amount was grant and the other 50 per cent was a loan which would be paid within 18 months. The money would be returned back to the Village Committee of fishermen. In the area of dry fishing, PA provided seed money to women groups of 10-12 members who would return the seed money once their dry fishing trade has stabilised. Caritas India has provided 17 fibre boats to 170 fishermen from the slum of Pentahkanta in Puri with DEC funds. The cost of each fibre boat and nets was Rs 2,20,000. The money was provided as a loan to the ten member group which they would pay back in due course.

⁴The details of five stages of CCP arte as follows:(i) in the first stage, discussion are made about what happened in the village during the last cyclone/flood (review and analysis)—before, during and after. (ii) Then a description of the village (situation analysis) relating to geographical features, population, infrastructure, natural resources, various livelihood and assets are prepared. (iii) A list of what causes damage in cyclone/flood and where (i.e., hazard mapping) is made in the third stage. (iv) In the next stage, an assessment is made about who is at risk (e.g.

fishermen at sea, shrimp seed farmers, widows and single women, elderly people and the disabled, pregnant women and children, families living near the sea), and what is at risk (e.g., cattle and livestock, family valuables, houses, livelihood assets like boats and nets, store of dry fish, food grains, etc; standing crops and fields, fixed assets like pumps and looms, etc; trees and plantation, and village water sources) (i.e., risk mapping: identifying vulnerable people and areas). (v) In the final stage, the community identifies those resources (such as safe house, building, cyclone/flood shelter, RCC houses, elevated land, safe evacuation route) in the village, which will help to reduce risks to life and property (i.e., opportunity mapping).

⁴To reduce loss and damage of cyclone, the central government (Irrigation and Power Ministry) appointed a committee under the chairmanship of P. Koteswaram. Koteswaram Committee, after studying various aspects of 1971 cyclone in Orissa suggested certain measures. They are: (i) identification of coastal areas those affected by high tide and cyclone, (ii) selection of strong building by district authority for shelter during cyclone, (iii) construction of two-storied cyclone shelter houses in high tidal affected areas and one-storey cyclone shelter house in the areas only affected by cyclone, (iv) construction of dwelling houses on high foundation, (v) construction of coastal embankment and afforestation in one km. width of seacoast, (vi) advance warning by district authority to people about the impending cyclone, (vii) deep tube well in the areas affected by high tide (saline water of sea), (viii) educating people about cyclone disaster mitigation, (ix) model cyclone plan in coastal area, (x) a cyclone code by the state government, (xi) formation of Natural Calamities Fund by Central government and many other suggestions.

Similarly, the state government of Orissa (Irrigation and Power Ministry) also appointed a Committee under the chairmanship of M.C. Pani in 1971 to estimate the loss and damage due to 1971 cyclone, possible arrangement to mitigate cyclone to reduce human loss and loss to property (vide Notification No. 32198/16-11-1971). The 31 pages Report was published in February 1974 (Nayak: 2000). The important suggestions of the Pani Committee Report are: (i) one kilometre width protective shield near seashore through afforestation and plantation and declaring these areas as reserved forest, (ii) no entry of cattle and no settlement by encroaches in these reserve forests, (iii) no permission to people to have settlement in the low-lying areas, (iv) construction of sand dunes near the low-lying villages and two-storied or one-strong building (by government) which will be a cyclone shelter house for the people, (v) gheri bandha around tanks, ponds, etc, and many other suggestions. The other measures are: (i) to maintain sand dunes and forest over it, (ii) to protect the mangrove forest, and extend it all along the coast, which is nature's own defence system, (iii) to strengthen the river embankments from the mouth of river to a distance where the sea water reaches in the high tide period, (iv) to construct dykes in the creeks so that saline water cannot enter but the rain water can easily pass into the sea, and (v) to construct cyclone-proof shelters in the cyclone-prone areas, etc. (Samal: 2001).

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