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Precarious livelihoods along India's disaster-prone eastern coastline: Socio-political and environmental dimensions of vulnerability and recovery

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Introduction

In recent academic and policy debates there is increasing recognition and more explicit concern of the social dimensions of hazard and vulnerability, beyond their physical properties alone. Exposure to hazard results in disaster when the functioning of a community or society is seriously disrupted, involving widespread human, material, economic or environmental losses or impacts, which exceed the ability of the community or society to cope using its own resources[1]. Vulnerability too is regarded as fundamentally social: vulnerability encompasses not only the likelihood of physical exposure to hazard, but also people's underlying susceptibility to its effects, and their ability to cope, respond and adapt (Adger, 2006, Eriksen et al., 2005). Thus disasters, though triggered by hazard events, are the result of a range of social, economic and political conditions. Disasters should not be considered as one-off or isolated events, but rather as phenomena with antecedents and consequences spanning many years. In order to understand how disasters interact with everyday marginalisation, retrospective enquiry into trajectories of recovery is necessary. The following definition of recovery is adopted, 'to have "recovered", a household should have not only re-established its livelihood, physical assets and patterns of access, but should be more resilient to the next extreme event' (Wisner et al., 2004: 359).

The above formulations shaped the focus of this study[2], which sought to understand the nature of vulnerability and recovery for selected coastal communities in Odisha ten years on from the devastating 1999 super-cyclone which hit its coast, officially killing over 10,000 people, with many thousands suffering devastation to their land, crops, livestock, houses and other assets. Both vulnerability and recovery are phenomena marked by social differentiation; inequalities lead to differential impacts during and immediately after a disaster, to non-uniform access to a variety of environmental, social and political resources during the recovery process, and to unequal levels of preparedness for facing the next extreme event. This paper restricts itself to an analysis of how livelihoods were affected by the 1999 super-cyclone, and how communities have struggled in a ten year period to re-establish their livelihoods in their trajectory towards recovery.

Study location

The research villages, located close to the coastline of Erasama block, in Jagatsinghpur district, suffered the brunt of the 1999 super-cyclone not least because of the 7-metre high tidal surge

[1] The United Nations International Strategy for Disaster Reduction's definition of disaster can be found at: http://www.unisdr.org/we/inform/terminology (accessed October 2011).
[2] This research was funded by the United Nations Development Programme, India. Field research took place in 2010.

which accompanied the storm, resulting in high mortality and destruction of assets. Four wards falling within two neighbouring gram panchayats were selected based on their relative distance from the seashore (0.5 to 4 km), their social and caste composition (Shuakunda comprises Hindu Bengalis, Kalabedi Hindu and Muslim Bengalis, and Garia and Sahadabedi comprise scheduled and high caste Hindu Oriyas respectively), and receipt of state and non-state support since 1999.

Material and Methods

A combination of quantitative and qualitative methods was used to conduct the retrospective enquiry of the past ten years, taking the pre-1999 super-cyclone scenario as the starting point. A complex 21-page household survey was enumerated in 30 households in each of the four wards, covering household members, land tenure and use, livestock and fruit trees, other livelihoods, housing condition, and receipt of government schemes, benefits and compensation. The survey included household calendars as an innovative way to prompt recall so to understand change over the decade. Survey data was later analysed using Excel and SPSS. In-depth interviews covering 13 themes were undertaken with one-third of the survey respondents, including male and females. Key informant interviews were undertaken with bureaucrats and elected representatives, bank managers, NGO and SHG representatives. Focus group discussions were also held in the wards, to triangulate information. Return field trips were made following preliminary analysis of data.

Results and Discussion

Paddy cultivation, and prawn/shrimp farming

Odisha as a geopolitical entity has typical contemporary agrarian credentials. Agriculture and animal husbandry contribute 23% to GDP, and provide direct and indirect employment to 70% of Odisha's workforce; thus agriculture plays a pivotal role in the state's economy (GoO, 2009). Our 120 sampled households own and/or operate 199 acres of land in 2009, of which 65% is under mono-cropped paddy, and 24.5% under aquaculture (prawn, fish, or mixed). The four sampled wards include two located in the strip of land 0-3 km from the seashore (Kalabedi and Sahadabedi), and two located further inland, 4-5 km (Garia and Shuakunda). Garia and Shuakunda's farmers mono-crop paddy on 90% and 96% of their owned and/or operated land respectively. However Garia's low caste Oriya households have little access to land (they own 18 acres), compared with Shuakunda's households who own 31 acres and sharecrop 38 acres. Two sluice gates built at the mouths of two local rivers in the early 1980s and 1990s are presently dysfunctional hence these two inland wards' paddy crop is often destroyed when inundated with salt water. For this reason farmers claim they cannot switch to high yielding varieties (HYV) of paddy, because their traditional paddy can withstand salinity. Although superior in taste and quality, the lower yielding traditional paddy is often damaged by wind, reducing the harvest. Local politics interferes with the sluice gates' repair, e.g. upstream villagers produce rock salt.

In recent decades prawn/shrimp farming has become pervasive close to the seashore. Prawn cultivation began around 1990 when wealthy outsiders, e.g. businessmen, bought up private land and took possession of government land in the area adjacent to the seashore (0-1.5 km), converting it into large prawn farms. The tidal surge which came inland 20 km during the super-cyclone is widely held to have increased soil salinity levels, which combined with financial difficulties due to their loss of assets, led local farmers to attempt prawn cultivation. As a result, prawn cultivation has expanded further inland (1.5-3 km). Nearly 50% of surveyed households have attempted prawn cultivation on their own or rented-in land in the past ten years, most without any support or guidance from outside agencies, and of these 50% made losses (large loans are taken, and disease is common) and just 35% profited. Due to the changing waterscape (prawn farms require saline not fresh water), many of Kalabedi and Sahadabedi's farmers, their land surrounded by prawn farms, have resorted to growing paddy in the summer season where possible. Following the super-cyclone there was a drastic reduction in the area sown under paddy,

from 223 acres in 1999 to 151 acres in 2000. By 2009 only 150 acres is under paddy. The number of cultivating households is now 96 (of 120), compared to 106 in 1999. Paddy production on own land has fallen from 154 acres in 1999 to just 73 acres in 2009, with the number of households cultivating their own land down from 92 to 67. Overall, the proportion of land 'rented-in' has risen from 29% of owned and/or operated land in 1999, to 41% in 2009. Food security, when using rice production as a proxy, remains precarious. Over ten years it has only 'recovered' to pre-1999 levels, which represents a pitiful state: 23% of households have no harvest, 44% less than 6 months rice, with just 4% having over 12 months. Farmers have been unable to diversify their production in a planned way, most cannot access support from the agricultural department, and just 29% of households access credit from coop societies, SHGs and banks.

Livestock and fruit trees

Erasama's villagers keep cows, goats and poultry largely for sustenance, and bullocks for plough. The super-cyclone decimated livestock (cows, bullocks, goats): of 669 owned by 120 households in 1999, only 92 (14%) survived the tidal surge. Ten years later, only the total number of goats is close to 1999 levels. Cows were decimated from a total number of 335 to just 31 after the super-cyclone, and households collectively owned just 105 cows in 2010. Many households have been unable to afford to re-purchase livestock, and the problem is compounded by a perceived lack of pasture, partly due to conversion of land that was once fallow to prawn farms. Reduced numbers of bullocks means timely preparation of farmland is difficult in the absence of alternative technology and less numbers of cows and goats means reduced intake of dairy products and meat.

A large proportion of fruit trees were destroyed in Erasama during the super-cyclone. Of the trees owned by our 120 sampled households, coconut trees were reduced to a third (1786 to 646), mango to less than a half (408 to 171), and cashew to just under a tenth (3905 to 348) their former number. In the subsequent ten years mango trees have regenerated to their former number (434), cashew remain at less than a third (1228) and coconut under 60% (1030). Fruit tree regeneration was one area where NGOs were especially active following the super-cyclone, providing coconut saplings to 71% of sampled households, cashew to 27% and mango to 14%. The coconut trees that have regenerated give a low yield, due to disease and increased salinity. Sale of coconut is down from 39% of households to 4%, and of mango down from 16% to 3%.

Migratory livelihoods, and the National Rural Employment Guarantee Scheme (NREGS)

In the past ten years there has been a tremendous increase in migration, especially to work in the private sector (90% of migrants in 2010). 62 of 120 sampled households (51%) had 78 migrants in 2010, with little ward-wise variation, compared with 19 households in 1999 (16%). The 70 private sector migrants have an average age of 24 years old, and 46 of these migrate outside of the state. Migration occurs due to lack of employment opportunity locally, restlessness among the younger generation, financial indebtedness due to losses in prawn, or landlessness or limited landholdings. Middlemen (contractors) often exploit young migrants. Those migrating for 12 months or more (n=55), remit a median average of just IRs 8,000 (€ 120) per annum. The two sons of one Sahadabedi respondent work in Pune for an automobile company, earning IRs 100 (€ 1.50) per eight hour day, doing overtime, with one day off per week. There is no labour union. They remit IRs 2,000 per month, with which their father repays a village money-lender. A young educated lady from Garia, who makes vests in Chennai, complained that their working condition is like a prison, and that they work seven day weeks. There is no indication of a causal relationship between the super-cyclone and migration, which is anyway on the rise within India. While risky and arduous, and remittances often pitiful, rural households depend on it.

NREGS guarantees 100 days employment in a year to any rural household willing to do unskilled manual work, and has been propounded as the most significant act in the history of contemporary

India because it provides livelihood security and facilitates the poor's participation in planning development activities. In the study site, however, villagers are in no way involved in such decision-making and most often work takes places with the use of heavy machinery owned by locally powerful elites. For example, while in Sahadabedi and Kalabedi men and women were seen manually renovating village roads, in Shuakunda men were seen alongside tractors, digging up soil to improve a road, and in Garia a JCB was seen excavating a pond. All surveyed households having a job card (74%) said they had worked under NREGS, but in-depth interviews revealed the complexities. One testimony says it all, "you must be aware about the job card? We are sitting at home with our job cards and the machines are doing the work. Even I have not signed in my job card; the authorities are getting our numbers from the gram panchayat, and withdrawing the whole amount. Recently our gram sathi [village youth working for NREGS] and two other gram sathis withdrew IRs 10,000 [€ 150] from my account...They have a tie up with the bank manager to withdraw the whole amount". On interview the Block Development Officer [the most senior, local bureaucrat] denied that heavy machinery is used, leave alone other problems. Even when labour work is undertaken, strict abidance to guidelines stating how much soil must be dug, irrespective of soil hardness, results in minimal payments for a day's labour. Delayed payments cause further difficulties for households living hand-to-mouth. From the villagers' perspective, the central government mega social welfare programme is a shambolic failure.

Environmental issues: Mangrove and forest cover

The Erasama research site lies in a coastal ecosystem strongly influenced by human settlement since the 19th century. The Bengalis of Kalabedi and Shuakunda wards, according to anecdotal accounts, came to settle in the region in the colonial and post-independence periods respectively, Kalabedi's ancestors having been invited by the local ruler to clear forest and cultivate paddy. As a result, mono-cropped paddy cultivation replaced natural mangroves in the early and mid-20th century. In recent decades prawn cultivation has become pervasive, led by powerful elites many of whom reside in coastal Odisha's principal cities. Odisha State Disaster Management Authority would like to regenerate mangroves along the coastline however the impoverished, fairly dense population and the politics of shrimp farming disallow this. The Casuarina plantation which the forest department attempted to regenerate following the 1999 super-cyclone is openly felled by local villagers for use as fuelwood and for sale. Due to socio-political relations, Kalabedi's forest management group is powerless to prevent this, as is the forest department: people need fuel.

Conclusions and Outlook

The research demonstrates ten years on from the 1999 super-cyclone, households continue to experience a high degree of ongoing livelihood vulnerability. Paddy cultivation, fruit trees and livestock have not been re-established to former levels, food security has worsened, and state schemes are poorly implemented. The minimal recovery of livelihoods is related to the inability of the majority poor to access vital resources from the state and other agencies. There are limits to the extent communities can assist themselves after a disaster. The paper's central message is that in the longer term, recovery, and hence resilience is a function not just of the scale of a disaster but also of the resources people are able to access over a prolonged period of time.

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