4

Embankment: the very basis of human habitation in the Sundarbans

4.1 Introduction

Embankments are crucial for the existence of human settlements on the deltaic islands. Breaches in embankments force change in livelihood pattern from land-based to water-based, which has significant bearing on the health of the ecosystem. The main focus of this chapter is on maintenance and management of embankments and the role of collective action. The chapter describes the current situation, explains the contradictions and narrates how the various actors cope with these. It helps to understand the behaviour of groups and organisations through collective action as an analytical tool and sheds light on configurations of conditions that facilitate collective action. The sub-cases in this chapter partly help meet the objectives of this research. Scientific objective is met in terms of assessing whether collective action as suggested in literature has a positive role to play and under what configurations of conditions. Policy objective is met in terms of responses of the state. These apart, the sub-cases also provide answers to questions such as: how contradictions can be better managed, how different social categories cope with limitations, why different groups and agencies conduct themselves as they do, and influence on collective behaviour of the frontier experience.

The scale of impact due to breach in embankment is however not the same on the two field study islands, nor is the consequent impact on the ecosystem the same due to loss of livelihood of the affected (see Photograph 4.1).

4.2 Significance of embankments

As seen in Section 3.3.1, the British hastened the process of reclamation in the Sundarbans; land was being claimed from the tides and forests before normal delta building process could proceed. In this natural process, silting up of the interlocking creeks forms islands. Eventually, the islands are connected by the filling up of the intervening channels and raised permanently above the high-water level. During the nineteenth century and thereafter, land was reclaimed at the limit of the low-water level by building embankments. The silt that would have been deposited on the islands, thus raising their levels, was now deposited in the creeks, raising their levels instead. Over time, the creek beds rose higher than the low-lying reclaimed areas, turning those areas into vast stretches of permanent marshes (Mukherjee, 1969). To prevent reclaimed land from turning into marshes embankments were erected,

although “The presence of embankments seals off the possibility of these tracts ever naturally maturing into lands habitable by humans” (Bhattacharyya, 1998; p. 93). This is the basic contradiction in the Sundarbans, an inherent incompatibility between the normal geomorphic processes and human settlements in the delta (see Figure 4.1). This incompatibility is characterised as “death-struggle” between freshwater and saltwater by Greenough (1998; p. 238). Though Greenough criticises Hunter's *A Statistical Account of Bengal*, (1875/1998) as historical fantasy, a passage quoted here does bring out the significance of embankments for maintenance of human habitation in the Sundarbans. “… other streams had interfered with and cut off the Kabadak from the Ganges, and left it what it now is, a mere tidal creek, with no headway of fresh water. Fresh deposit must then have ceased to a great extent; the rains would have gradually washed away the upper stratum of soil, and lowered the general level; the place would soon become sickly, and finally forsaken by all but those whom dire necessity kept chained to the spot. Of all the villages that once existed over this portion of Jessore, the miserable village of Gobra remains. The area of this village has also decreased, and the cultivation of rice does not extend to within two miles of where it once did. The soil is gradually becoming more and more impregnated with salt and unfit for crops; and were it not for embankments, and the fresh water that drains and passes down the Kabadak in the rains helping to wash out the salt of the soil near the banks, Gobra would soon be deserted also” (Hunter, 1875 [1998]; p.40).

According to O'Malley (1914/98), for making human habitation possible on the islands, first, land had to be embanked along streams in order to keep saltwater out. Next, the forest had to be cleared, tanks had to be dug for water supply and storage, and huts built for the workers. These were arduous occupations since tigers and fevers were always dangerous companions of the process. When these were accomplished, rice had to be planted immediately, or a reed jungle would soon overrun the region again. The initial erection of embankment, clearing of mangroves, construction of human habitation, and finally, cultivation was sponsored by the *zamindars*, making them private property. The embankments were very weak due to unscientific building methods (without adequate width, compaction, and free board)[1] and unsuitability of soil characteristics for construction and maintenance of such structures and required regular maintenance. Alignments of the embankment were also defective[2] (Sarkar, 2002; Bhattacharya, 1999). Since the abolition of the '*zamindari* system', these embankments came to be known as *ex-zamindari* bunds[3] (state property or public property). “With the *zamindars* gone, there was none to repair these. Not even the State Government had any budget to cover the costs of maintenance. Funds were released only when there was an emergency. When the

[1] According to D. Biswas, Civil Engineer of repute, of the Govt. of West Bengal, width of the embankment depends on soil characteristics as well as other factors. Sandy soil or silt demands greater embankment width as compared to clayey soil.

[2] Tushar Kanjilal, founder of Tagore Society for Rural Development (TSRD) and author of *Who killed the Sundarbans?* has spent all his working life in the Sundarbans. He has been advocating an open-system wherein tidal waters are allowed to come in on the islands till the high-water level, and embankments built at this point (Mitra, 2007; p. 33).

[3] Constitution of India was amended for the first time in 1951 after fifteen months of its working. The Constitution (First Amendment) Act, 1951 abolished the *zamindari* system.

ravages were too great to handle, they simply abandoned the affected structure. … As these *bunds* collapsed under the pressure of the tides, the fields got flooded with saline water. This has been an agonizing experience…" (Chakraborty, 2005; p. 5).

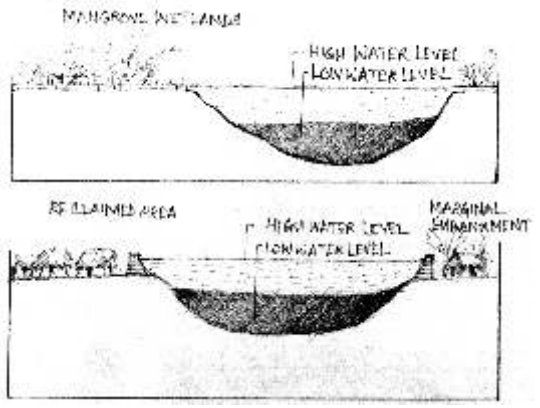
Photo 4.1: Embankments in field study islands

Inhabitants are not threatened by high tide water level on south-eastern side of Mollakhali.

Work in progress on a devastated stretch of embankment on south-western side of Mousuni, stubs of palm trees are from an earlier event.

With the collapse of embankments and saline water incursion into agricultural fields, cultivators turn to other occupations, but, due to cultural preference for agriculture and the inability to raise staple crops for own consumption it is a big psychological blow. As a consequence, most of the affected families feel they are worse off than before. Of the 243 households interviewed on the two islands, 93 have had to change their occupation from agriculture due to embankment collapse and 67 (72 percent) of these households reported being worse off; see Table 4.1 for details. Interestingly, only 4 of the 26 better off households are from Mollakhali, the rest from Mousuni. This difference could be due to the attitudinal difference in general between the

Figure 4.1: Normal geomorphic processes hindered by human settlements



people of the two islands. Perhaps connectivity with the outside world is responsible for the progressive outlook of the people of Mousuni since the degree of exposure is much higher there than in Mollakhali. There is a historical difference as well, people

had come to Mousuni seeking opportunities whereas people were brought to Mollakhali to work as farm labourers; those who had migrated voluntarily did so to escape caste and religious oppression in their places of origin. Thus, one set of people came for the frontier experience and embraced it while the other was compelled to confront the frontier process.

Every time there is a major breach in embankment, human pressure on the ecosystem intensifies; about 52 percent (48 out of 93) of the affected households turned to water-based livelihood activities and became directly dependent on the riparian commons (28 in Mousuni and 20 in Mollakhali). Effective maintenance and management of embankments therefore, has a significant bearing on sustainability of the global commons. However, breaches in embankment do not affect the

Table 4.1: Embankment collapse and its consequences

Number of affected families	Changed occupation	Cultivation on residual land	Reported Worse off	Reported Better off
8	Agricultural labour / cultivation on leased land	0	8	0
32	Tiger shrimp seed collection	4	32	0
34	Daily wage labour + TSS trade [4]	0	25	9
4	Rickshaw van	1	1	3
2	Petty trade	1	1	1
2	Shrimp nursery	0	0	2
6	Trawler deckhand	1	0	6
5	Aquafarm	0	0	5
93		**7 (7.5%)**	**67 (72%)**	**26 (28%)**

community uniformly. Forest clearers of tribal origin were the initial settlers; they can still be found living along the embankments. On both the islands tribal settlements (*adivasi para)* are along the periphery of the islands facing a river or creek, these people are more vulnerable than others but possibly also more resilient (details in Section 4.4). Cultivator families with relatively large holdings (2.7 ha or more), mostly descendants of persons in charge of clearing operations and bringing land under cultivation (*jottdars*) are centrally located along cross bunds and freshwater *khals* (canals). In cases of embankment collapse over large sections, the larger cultivators appear more vulnerable than the smaller ones, most likely because quickly unfolding events require quick responses and small landholders have less to take care of. It could also be possible that the larger and smaller cultivators are attitudinally different because the two groups cope with different kinds and levels of stress on different counts, e.g. the larger cultivator in case of a destructive event counts losses whereas the smaller cultivator looks for opportunities to feed the family and tide over the crisis.

[4] Part-time *meen byapaaris* (Tiger Shrimp Seed (TSS) traders) conduct their trade for 14 days in a month based on lunar position, for the rest of the month they pursue some other means of livelihood, daily wage labour in this case, all three of them are from Mousuni.

4.3 Maintenance and management of embankments

Independent India inherited 3500 km of marginal embankments in the Sundarbans. Responsibility of maintaining and upgrading these embankments was assigned to the Drainage Wing of the Irrigation Department (GoWB). The Irrigation Department has elaborate deployment of manpower in the Sundarbans under the jurisdiction of Joynagar Division; it has to spend as much as 60 percent of its budget on its employees and other overheads (Kanjilal, 1999b). The islands of Mollakhali and Mousuni are under Gosaba and Kakdwip Subdivisions respectively. Under each Subdivision, there are several Sections. One such Section Office is at Chotomollakhali, manned by an engineer, a work assistant and thirty other workers.

Ever since the landmark constitutional amendments of 1993, the Section Offices no longer have the budget to carry out maintenance of embankments; budgetary allocations are now made to the Panchayat Samitis (intermediate level of local self-government). As a consequence of the landmark amendments, a situation has arisen where budgetary allocation is made to one institution whereas the skill is with some other government organisation, unlike Gujarat and Maharashtra[5]. Choudhuri points out, "Administrative reforms transferring control over civil servants from line departments to local governments have to be initiated" (Choudhuri, 2003; p. 8). Though West Bengal has transferred functionaries to local self-government institutions for twelve of the 29 items listed in Schedule Eleven of the Indian Constitution[6], Drainage Wing of the Irrigation Department is not one of them, and Sundarbans has to wait until then to bridge the gap between intent and practice in terms of better management of embankments as well as conservation of the ecosystem.

4.4 Negotiating embankment collapse

As reclamation progressed in a phased manner, the first patch that was cleared, embanked, and brought under cultivation had at least one embankment facing a river or creek, and at least another facing uncleared forestland. With further reclamation the earlier land-facing embankments became cross bunds within the island serving the purpose of connecting two habitation sites and or as canal banks. The cross bunds also serve as surface water management structures. Many of these cross bunds have subsequently become brick-paved roads. The *jottdars* came to occupy these lands away from the margin of the island and are affected only in case of embankment collapse over vast stretches or washout. Obviously, the centrally located landed households and the households on the margins negotiate embankment collapse quite differently. Moreover, some sections of the islands are more prone to recurrent breaches and erosion than others (see maps of Mollakhali and Mousuni;

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[5] The western States of Gujarat and Maharashtra were early reformers, transferring many activities, including primary healthcare and education to district Panchayats. In both States, funds were devolved as well and a separate administrative services – the Panchayat Service in Gujarat and the Maharashtra Development Service in Maharashtra – were set up to facilitate the transfer (or deputation) of State-level civil servants to work with the district Panchayats. See Annexure I.

[6] The newly introduced Schedule XI contains a comprehensive list of functional items that come under the purview of the local self-government institutions; see Annexure I. Schedule VII mentions the State List. There is considerable overlap between the two schedules.

Chapter 3, Figures 3.4 and 3.5). People along these stretches are resigned to the fact that some time or the other the river will force them to move. Cultivators with agricultural land adjoining weak embankments make their own arrangements to derive one last crop before the embankment gives away (see Photograph 4.2[7]). Sk. Abdul Rashid has had to move his semi-permanent house twice in the past 17 years. Sk. Rashid is a teacher at Baliara High School on Mousuni Island. His house was on the western side of Baliara village; remnants of the second house can still be seen during low tide. His family has lost all agricultural land it owned in Baliara. Sk. Rashid is among the wealthier ones in the village with a regular monthly salary, and thus can afford to build his semi-permanent house over and over again. The

Photo 4.2: Embankment on the verge of collapse

overwhelming majority of the population can neither afford to build houses over and over again nor do they have a salary, for them paddy is the main source of sustenance and earning. They just dismantle their huts and relocate them elsewhere, at times even on private land. Sections of the western embankment in Baliara were washed away in October 2004 and it has been moved further inland, it is only a matter of time before the embankment is moved further inland[8]. There is practically no worthwhile mechanism to rehabilitate or compensate the affected families due to inadequate budgetary allocations despite legal provisions for the same. For the affected, the process of seeking compensation is time consuming, and the nature of compensation insignificant (Kanjilal, 1999a), except in the case of Ghoramara Island (Sagar Development Block) from where families are being relocated on Sagar Island since the entire Ghoramara Island is under threat of being eroded away. Gram Panchayats and NGOs provide some material support (bamboo poles, plastic sheets and iron nails) to the poor to rebuild their huts, and distribute emergency relief material to tide over the immediate crisis.

[7] The embankment seen in the photograph is the inner one, locally known as *ring bandh*, the outer one being already beyond repair has been abandoned.

[8] Mousuni Island lost about a kilometre-and-half of embankment on the western side along Kusumtala and Baliara *mouzas* in September 2005. This breach, washout in fact, is greater than the preceding year's, along the same stretch of the island.

The following narratives describe four incidents of collapse/breach, and the responses of the various actors. These incidents occurred during my stay on the islands (see maps (Chapter 3, Figures 3.4 and 3.5) for locations), and provided the opportunity to observe collective action, both *institutionalised* and *spontaneous* forms, in the face of disaster; dysfunctionality of official institutions to render services; and blockages to collective action. There were other minor incidents of breach in the embankment during my stay on the islands but those affected only a couple of families at a time. In such cases it is left to the individual household to cope with the situation as is apparent from the photograph on the preceding page. The incidents also demonstrate that collective action in both forms has the potential to make adjustments with forces of nature, if properly backed up, though the manmade structures can never really withstand the ravages of nature.

Kalidaspur: May 2001

Kalidaspur *mouza* is part of Chotomollakhali Gram Panchayat (GP). Eastern and southern portions of the *mouza* are prone to recurrent breaches in the embankments. The embankment along a stretch close to the ferry *ghat* (boat landing site) was in a precarious state in January 2001, so much so that people avoided walking on the embankment on that stretch in fear of it collapsing. Villagers had reported the precariousness to the Section Office of the Irrigation Department as well as the Gram Panchayat although they did not expect either the Department or the Panchayat to respond effectively. The Irrigation Department carried out preliminary inspection; the Gram Panchayat was not in a position to respond to the impending crisis due to prevalent political situation. The villagers, particularly the farmers were a worried lot barring two farming households who were looking forward to the breach so that they could turn their agricultural land to aquafarms. Lion's Club of Kalidaspur (*para* 'club' located close to the stretch) was trying to get all the actors involved; they were the ones to contact the Gram Panchayat, Irrigation Department, as well as Forest Department as a matter of course. Two of its members, Monoranjan and Debabrata appeared to be the driving force. Both are educated (post-graduates) young unmarried males from relatively well-to-do cultivator families, and the community looks up at them to provide leadership. While both do not shy away from providing leadership, they also see these occasions as opportunities to build networks for themselves with the outside world and make it a point to put forward their case for employment outside the island by providing a copy of their CVs to the outsiders. Being educated and in position of leadership, it is imperative that they move on to something more significant than agriculture in the eyes of the community, possibly employment in the city. Their status does not permit them to stick to their traditional occupation of agriculture. If they fail to move out of the village, not only do they lose their position in the community but also run the risk of being ridiculed for studying so much to no avail.

On May 26, 2001 a section of the embankment gave away as water was receding during low tide. Since it was waiting to happen, word soon spread and people gathered to take stock of the situation. Members of Lion's Club decided to start repair work immediately so as to get as much work done before the next high tide. They had the support of the local Gram Panchayat member as well as that of the community. Debabrata got down to coordinating the repair work, which involved erecting a bamboo fence and dumping sandbags. Able-bodied male members of the .

community volunteered spontaneously with labour and material. By the time the first sandbag was dumped daylight was fading. Monoranjan decided to hire a generator and powerful lights since work had to go on till the stretch was secured, money was pooled in for the purpose. Repair work went on late into the night. The club was converted into a large kitchen to feed the men and boys. By day break the stretch had been secured, for the time being[9]. The local Gram Panchayat member suggested that generator and light hiring charges could be claimed from the Gram Panchayat in due course. However, till my last visit to the village in February 2004, the villagers had not been reimbursed of the expenses incurred for repairing the embankment. The Gosaba Panchayat Samiti cannot make good the expenditure since the repair work did not have prior approval. A member of the Public Works Committee of the Samiti said that in view of the emergency situation, the Chotomollakhali Gram Panchayat could have made the payment for the generator and lights had it been functioning regularly, an example of going in circles to nowhere.

Kusumtala: May 2003

On the southwestern side of Kusumtala, close to the *mouza* boundary with Baliara, there is a primary school, not far from the embankment. In May 2003, the embankment breached resulting in saltwater incursion. With high tide, water level would rise to submerge the *kutcha* (unpaved) road, making the school inaccessible to children. The Mousuni Gram Panchayat had just been constituted after the elections in April 2003. The previous regime was voted out; the new one was yet to settle down. Male members of the community were too excited with the political developments (the previous regime was in office for two consecutive terms) to pay attention to the inconvenience of the children. Mothers kept complaining but of no avail. Geeta Jana, a local resident and mother of three school-going children, got in touch with Gayatri Gore of Baliara, the leader of Self-Help Groups (SHGs) on the island. For mothers like Geeta the primary school served two purposes: one, it kept the children occupied for part of the day, and two, it provided uncooked rice and lentil as part of the mid-day meal scheme of the Indian Government[10]. On Geeta's insistence Gayatri Gore spoke to the Panchayat Pradhan (elected chief) who said the Panchayat was too new, and it would take quite a while before it could have the repair work sanctioned by the Namkhana Panchayat Samiti. In view of the fact that rival political groups control the Samiti and Gram Panchayat he suggested that it would be better if the road level were raised through voluntary labour. Gayatri and Geeta spread the word about voluntary labour among SHG members. They decided that women would cook near the site and help the men with the work; the work was scheduled for three days. On the first day, the women waited for the men to arrive but none turned up. After three hours of waiting they decided to do the work themselves and not permit men to work even if they turned up the next day or the day following. It took 118 women working in turns

[9] The embankment was abandoned in November 2003. Another embankment further inland (*ring bandh*) was constructed which left several households landless. Lion's Club of Kalidaspur does not have a building anymore since the *ring bandh* passed right through the building.

[10] From the beginning of the academic year 2005-06, rice and lentil are no longer provided in uncooked form to be taken away by the children as part of the mid-day meal scheme. Instead, children are served cooked food at school.

four days to raise the level of the road to the extent that children could attend school again. The women did not seek financial assistance from the Mousuni Gram Panchayat or any other organisation/department. All SHG members take great pride that women could do the job without any help from a single male[11].

Baliara: September 2003

The southeastern part of Baliara, just south of the ferry *ghat*, is vulnerable to river erosion and embankment failure. The outer embankment has a number of breaches; a *ring bandh* further inland has been constructed. The Forest Department planted mangrove saplings on the stretch in between the old and new embankment but the saplings barely managed to survive since the stretch was popular with Tiger Shrimp Seed collectors using drag-net, because the older embankment provided them protection against strong currents (Chapter 8 deals with aquaculture and provides details about Tiger Shrimp Seed Collection). As is the practice, none of the families were compensated for the loss of land due to *ring bandh* construction. Thus, the cultivator families were keen that the mangrove plantation survives to give stability to the *ring bandh*. The Forest Department needs success stories to justify the plantation work it does, and therefore, was keen that the plantation survives. However, neither the cultivators nor the Forest Department officials were yet able to prevent the Tiger Shrimp Seed collectors from operating their nets along that particular stretch.

The new Panchayat Pradhan of Mousuni Gram Panchayat (elected in April 2003), however, managed to implement a ban on Tiger Shrimp Seed collection on that stretch. The collectors have moved further south as that part of the island is sparsely populated. Implementation of the ban has been possible for the fact that the Pradhan is a resident of that area, and the stretch falls under his constituency. He has consistently been a Gram Panchayat member from that particular election booth, irrespective of his party's performance on the island. For implementing the ban, the Pradhan involved a community youth club, which enjoys a tremendous rapport with the community because of its social service. The club has galvanised women to form SHGs, provides relief in times of natural calamity, and supports education of children of the poor through book banks and scholarships. It is interesting to note that the club is primarily funded by the well-to-do cultivators but most members are poor who are dependent on the larger cultivators in a number of ways, for example, lease of land for winter crops, access to fresh water from ponds and canals, as well as for homestead land when it is lost to river erosion. One cultivator family was found to have provided homestead land to six families free of charges. The well-to-do cultivators also have *bhagi* (sharing) arrangements with the poorer families. In *bhagi*, the well-to-do fund acquisition of goats and pigs, which the poorer families get to rear and retain half the number of offspring before returning the animal to its owner in an impregnated state. The well to do and the poor appear to participate in a symbiotic relationship and see their own welfare in each other's well being.

[11] Later that year, almost the same group of women helped a newly widowed SHG member to harvest her paddy crop and sell it at an appropriate price.

Baliara-Kusumtala: October 2005[12]

During September 18-21, 2005, Mousuni Island lost a kilometre-and-half of embankment to tidal surge on the western side along Kusumtala and Baliara *mouzas*. The collapse affected 321 families, mostly from Baliara (272 families). As the tidal surge moved from south to north, people attempted to erect bunds from west to east to protect crops. These temporary bunds overflowed and failed to provide protection. Vast stretches of agricultural land were inundated with saline water, killing paddy almost instantaneously; the indigenous varieties however, survived (see intermittent patches of green in the Photograph 4.3). Small landholders converted their inundated paddy lands into makeshift aquafarms by uprooting the dead and dying paddy plants.

Photo 4.3: Paddy land inundated with saline water

In response to the washout, the Namkhana Panchayat Samiti rushed relief material to the island. The Mousuni Gram Panchayat distributed official relief received from the Panchayat Samiti based on the BPL list. Meanwhile, a community youth club (the same one mentioned in the previous incident) sent an appeal for relief to an NGO, which in turn routed it to an international NGO (iNGO). The iNGO rushed relief in the form of rice, lentil, bulgur, cooking oil, and polythene sheets but the supply was inadequate to meet the demand of all the affected families. Arrival of relief material was delayed by a day due to a *bundh* (strike)[13] called by a leftist trade union organisation. Finally, when relief material reached the island there was disagreement among the local Gram Panchayat member and representatives of the iNGO, NGO, and the community youth club regarding mode of distribution since there was not

[12] When this incident occurred I was no longer conducting fieldwork. I was informed and asked to visit the village by one of my acquaintances on the island, and had the opportunity to observe and participate in the collective action involved in distributing relief material to the affected families.

[13] West Bengal is infamous for its *bundhs*. It is a form of protest – strike – by political parties and their affiliates wherein normal life comes to a grinding halt due to forced stoppage of services and closure of public and private establishments. It is an all-India phenomenon, but by and large West Bengal experiences the maximum number of *bundhs* in any given year.

enough of it. The Gram Panchayat member wanted relief to be distributed evenly as per the BPL list to all affected; the iNGO did not want any reduction of amount to be distributed per household while the NGO and the club both wanted to cater to the most vulnerable irrespective of the BPL list. The NGO and the club argued that in the given situation the poorest (with names on the BPL list) were not necessarily the most vulnerable. It took a day's deliberation to reach a compromise in which I participated. Ultimately the NGO and the club prevailed[14] over the Gram Panchayat member as well as representatives of the iNGO but distribution of relief material was delayed by another day due to incessant rain. The victims of disaster suffered due to disagreements among the actors.

4.5 Analysis

In the absence of a Delta Authority in the Sundarbans, the community is faced with a public-good dilemma so far as the embankments are concerned. Individuals who would benefit from the provision of the public-good find it costly to contribute and prefer others (resource transfers to Panchayat Samiti) to pay for the good instead. Naturally, the good remains underprovided. However, there is solidarity in the face of disaster rather than in action to prevent such disaster from occurring. This solidarity is evident from collective action, both *spontaneous* and *institutionalised.* The analysis that follows answers why this is so.

Behaviour of individuals in public-good dilemmas is affected by many structural variables such as group size, heterogeneity, dependence on benefits received and discount rates, as well as changing combinations of *interest*, *organisation*, *mobilisation*, and *opportunity*. Typically, in case of embankment as public-good the group size is in excess of 25,000 individuals and heterogeneous at that, not only in terms of religion and ethnicity but also in terms of location on the island, endowment and dependence on immediate benefit (see Group characteristics under Category B in Table 2.1). Obviously, the discount rates of households on the margin of the island and those further inland are not the same. The ones at the margin apply very high discount rate since they are concerned with sowing one last crop that they can derive before the embankment collapses. Under these circumstances turning embankments into common property from public property appears imprudent since common property management regimes necessitate *institutionalised* collective action. The *institutionalised* collective action organisation, the Panchayat Samiti at the Development Block level in this case is under-equipped since skill has remained with the Irrigation Department, *institutionalised* collective action organisation at the State level. Nevertheless, the four incidents reported in the previous section permit analysis of the extent of collective action (as a function of *interest*, *organisation*, *mobilisation*, and *opportunity*), the behaviour in collective action (as a function of *trust*, *reciprocity* and *reputation*), the facilitating conditions of collective action, and the external environment (Category D in Table 2.1).

[14] I do not know if the NGO and the club were favourably disposed toward the landed and well off given the dependence of the poor on the well off, and the funding the club receives from the landed. I went along with their argument based on the fact that the coping mechanism of the poor appeared more effective in the changed circumstances, the well-to-do cultivator families appeared less resilient.

In the Kalidaspur sub-case of Mollakhali Island *spontaneous* collective action emerges in the face of disaster. This can be explained with the help of Tilly's four big components of collective action. *Interest* in the community to repair the breach was almost universal with intensive involvement of all those who were threatened by the breach with the possible exception of the two households looking forward to the breach as an opportunity to change land-use from agriculture to aquaculture, who also possibly passively complied with the repair work; *organisation* varies from intensive involvement to passive compliance. *Mobilisation* was defensive as tragedy was at hand and *opportunity* arose because the collapse coincided with the receding tide. Moreover, the external environment in the form of *institutionalised* collective action organisations at different levels was either limp (Gosaba Panchayat Samiti) or dysfunctional (Section Office of the State Irrigation Department) therefore, extent of *spontaneous* collective action was high.

If the community in Kalidaspur is capable of *spontaneous* collective action to such an extent, then the question that needs to be answered is why it cannot be sustained to maintain the embankment. There are two explanations for this: i) endowments and discount rates being different, offensive or preparatory *mobilisation* cannot take place since preparatory *mobilisation* requires foregoing present benefit in favour of uncertain future benefits, and it is only the rich and the powerful who can afford to opt for either of the two or both; ii) *institutionalised* collective action in this case has two basic problems: a) the Panchayat Samiti does not raise resources directly and depends on resource transfers thus intensive involvement is difficult to sustain, and b), while the problem is local (village level), the *institutionalised* collective action organisation is at the Development Block level, a step too far removed from the problem as well as the affected community. This situation is contrary to the Polder Model of Dutch Water Boards where, originally, the 'stronger shoulders' help carry the 'weaker ones' giving rise to solidarity in the face of threat from nature/water (Van de Ven, 2004).

Behaviour of the different actors in the Kusumtala sub-case of Mousuni Island can be explained with the help of individual attributes of *trust*, *reciprocity* and *reputation*. Gayatri Gore had a *reputation* that Geeta Jana and other SHG members *trusted.* This prompted Geeta Jana to approach Gayatri Gore, and also because of this *reputation*, the Panchayat Pradhan made the pragmatic suggestion of making use of voluntary labour to raise the level of the road instead of making promises of looking into the problem and finding a solution. The Pradhan was aware that due to political rivalry, the higher level of *institutionalised* collective action organisation would undermine his authority (unfavourable external environment) if he were to make promises to the people of Kusumtala, the affected women in particular.

Gayatri Gore made use of the social capital (past successful experiences) to *mobilise* and *organise* the women when men did not turn up to volunteer labour. She and other SHG members took this *opportunity* to reinforce their strength and extend their space within the male dominated arena, which was in their interest, and perhaps to affirm gender equity in decision-making.

Note the attitudinal difference between the SHG members of Kusumtala and members of the Kalidaspur Lion's Club. While at Kalidaspur it is unlikely that a

similar situation to that of May 2001 would elicit similar *spontaneous* collective action due to the fact that some of the club members were unable to have the expenses reimbursed and were unhappy about the situation, whereas the SHG members of Kusumtala took pride in what they were able to achieve without assistance through *spontaneous* collective action. This perhaps is a reflection of the frontier mentality characterised by a can-do attitude (self-reliance). This attitude is similar to that of the embankment failure affected people of Mousuni. People in the western Sundarbans came looking for newer opportunities and took up tenancy directly under the colonial administration whereas the ones in eastern Sundarbans were either brought in as labourers by the *zamindars* or migrated from their places of origin to work for the landlords and escape caste or religious oppression. Thus, despite both groups occupying a frontier zone their response to similar situations was different.

The club in Baliara on Mousuni Island was a *trusted* entity in the economically heterogeneous community. The poor (homogeneous group characteristics) could expect assistance from the club while the rich (homogeneous group characteristics) were able to further their interests through the club. The Pradhan who himself is a member of that community is aware of these dynamics and thus got the club involved in implementing the ban on Tiger Shrimp Seed Collection. The seed collectors agreed to abide by the ban because of the club's *reputation* that it would cause them no harm. Moreover, the *interest* of the landed, the Forest Department and the Gram Panchayat coincided. This is an example of *offensive mobilisation* by the landed and well to do.

The Baliara-Kusumtala case of Mousuni Island demonstrates that the two forms of collective action can come together to overcome tragedy when the following conditions exist: the two forms do not undermine each other's authority (favourable external environment under Category D, Table 2.1); there is social capital of past successful experiences; there is appropriate leadership (in this case it was mainly provided by the NGO); there is interdependence among members of the community, that is, heterogeneity of endowments and homogeneity of interests; and nested levels of governance (in the face of disaster the Namkhana Panchayat Samiti did not hold back relief material from the Mousuni Gram Panchayat despite being constituted of opposing political groupings).