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Corruption in cyclone preparedness and relief efforts in coastal Bangladesh: Lessons for climate adaptation?

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ABSTRACT

This article seeks to draw possible lessons for adaptation programmes in Bangladesh by examining whether cyclone preparedness and relief interventions are subject to corrupt practices. Based on a random sample survey of 278 households, three focus-group discussions and seven key-informant interviews, the article investigates the nature and extent of corruption in pre- and post-disaster interventions in Khulna before and after Cyclone Aila in May 2009. Ninety nine percent of households reported losses from corrupt practices. Post-disaster interventions (such as food aid and public works schemes) suffered from greater levels, and worse types, of corruption than pre-disaster interventions (such as cyclone warning systems and disaster-preparedness training). Using an asset index created using principal component analysis, the article assesses how corruption affected wealth quartiles. Ultra-poor households were affected more by corruption in pre-disaster interventions, the wealthiest quartile more in certain post-disaster interventions, in particular public works and non-governmental interventions. These findings may hold lessons for attempts to increase resilience as current adaptation measures mirror some cyclone preparedness and relief efforts.

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1. Introduction

The Intergovernmental Panel on Climate Change (2001, 2007) indicates Bangladesh is highly vulnerable to climate change. Projected impacts include greater scarcity of fresh water in the dry season (due to less rain and higher evapotranspiration), greater drainage congestion (due to higher levels in water courses partly from higher sea levels), greater river bank erosion, more frequent and severe floods and cyclones, and greater soil salinity in the coastal zone. Such hydrological changes particularly threaten low-lying coastal areas where citizens live in flood- and cyclone-prone locations.

The Bangladeshi government is committed to adaptation as illustrated by the country's National Adaptation Programme of Action (NAPA), the Climate Change Strategy and Action Plan, National Climate Change Trust Fund and the multi-donor Climate Resilient Fund (for example, see MoEF, 2005, 2009, and GLCA, 2009). However, the success of programmes depends partly on the level of fiduciary risk (in other words, that adaptation funds are used for intended purposes). Here there is good reason to be concerned. Bangladesh was ranked bottom of Transparency International's Corruption Perceptions Index (CPI) for five consecutive years between 2001 and 2005. Whilst this ranking has recently recently, the 2010 CPI still placed Bangladesh 134th from 178 countries.

To try and draw useful lessons for climate adaptation, this article investigates the nature and extent of corruption in cyclone preparedness and relief efforts in coastal Bangladesh. It focuses on interventions before and after Cyclone Aila that struck South-West Bangladesh and coast of West Bengal, India, on the 25th May, 2009. According to the Disaster Management Bureau (2010), Aila killed 190 people directly and affected over 3.9 million (with 243,000 houses and 77,000 acres of farmland destroyed or badly damaged). Even fourteen months afterwards, when the primary research for this article was conducted, embankments in four upazillas (the sub-district administrative unit) in Khulna and Satkhira districts had not been repaired and over 47,000 households were still homeless. A key aim of the research was to investigate how the experience of corruption varied across wealth groups.

The article consists of five further sections. Section Two offers a quick overview of the relationship between corruption and development, a brief summary of the emergent literature on corruption and climate change, before focusing on corruption in

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Bangladesh. The third section discusses the inherent difficulties of researching corruption, and outlines the research methods and statistical techniques employed. Sections 4 and 5 present findings on corruption in pre- and post-disaster interventions, respectively. The sixth section concludes.

2. Corruption in Bangladesh: an overview

The extent to which corruption impedes national development has been a matter of debate. The intuitive argument that corruption is one cause of low economic growth and high poverty rates (Myrdal, 1968) can be contrasted against arguments where corruption is seen to improve efficiency through overcoming market failures caused by bureaucracies (Leff, 1964). The recent macro-level evidence, unsurprisingly, favours the former argument, especially when considering human development, and highlights multiple equilibria in the negative relationship between corruption and development (see Aidt, 2009; Haque and Kneller, 2009; Qizilbash, 2001). Numerous micro-level mechanisms – such as path dependency through reduced reporting, lower penalities and peer-group effects – are suggested as possible channels through which countries remain locked in a high corruption, low development trap (see Aidt, 2009).

Despite substantial financial flows required for mitigation and adaptation, until recently there has been little mention of corruption within climate debates. This can partly be explained by the burden of mitigation falling on Annex I parties where, on the whole, there are reasonably low levels of corruption, and the late arrival of adaptation to the climate stage (Pielke et al., 2007). However, due partly to a lack of integrity within the Clean Development Mechanism (Green, 2008; Ostrom, 2010), concerns about high levels of corruption in certain forestry ministries (see Ebeling and Yasue, 2009; Barr et al., 2010) and the pressing need to disburse fast-start funding for adaptation, greater emphasis is now being placed on corruption. This is most clearly demonstrated through Transparency International's (2011) annual report on climate change. This includes two chapters on Bangladesh – Martinez and Bastemeijer (2011) and Zaman and Khuda (2011) – where it is accepted corruption is widespread and contributes to social and economic deprivation (Iftekharuzzaman, 2009; Iftekharuzzaman and Tanvir, 2008; TIB, 2008; Tanvir, 2006). For example, the World Bank (2000) estimated if Bangladesh could reduce corruption to the level prevailing in Scandinavian countries, it could add 2.1 to 2.9 percent to annual per capita GDP growth.

Whilst corruption is often defined as 'the abuse of public office for private gain' (see Bardhan, 1997), this article uses Transparency International's definition of corruption – the abuse of entrusted power for private gain – and considers eight forms of corruption (see Transparency International, 2009; Karklins, 2002). First, *bribery*, defined as offering, promising, giving, accepting or soliciting an advantage as an inducement for an action which is illegal, unethical or a breach of trust. Second, *wage/asset stripping*, which is the appropriation or illegal use of entrusted funds/goods for personal gain. Third, *extortion*, defined as an act of utilizing, either directly or indirectly, one's access to a position of power or knowledge to coerce unmerited cooperation or compensation. For example, a service provider may force a recipient to make an unofficial payment. Fourth, *fraud*, the act of intentionally deceiving someone in order to gain unfair or illegal advantage. Fifth, *favouritism*, *nepotism* and *patronage*. Usually based on acquaintances and kin relations, these actions involve the exploitation of power/authority to provide unmerited opportunities for family or friends. Patronage often seeks the cultivation of political and/or clientelist networks. Sixth, *refusal* or *negligence to provide services*. For instance, when service providers create a barrier so recipients offer illicit payments. Seventh, *influence peddling*, defined as influencing decision-making for personal benefit (and which contrasts with legitimate political lobbying). And eighth, *procurement irregularities*, where an official awards a contract or influences the tendering process for personal interest.

Transparency International Bangladesh (2010) provides estimates of the scale of corruption: 72% of households were forced to pay bribes averaging Tk. 4834 (US$ 68.6) for receiving services from different sectors from June 2009 to May 2010. This equates to a mean annual per capita figure of Tk. 637 (US$ 9.04), and a total of Tk. 95.92 billion (US$ 1.36 billion). The same survey shows the incidence of corruption was highest in the judiciary (where 88% of households receiving services were victims of corruption), followed by the law enforcement services (80%) and land administration (71%), as illustrated in Table 1.

Importantly, the impact of corruption differs across wealth categories. Iftekharuzzaman (2009) estimates that 3.84% of annual household income in 2007 was absorbed by corruption in six sectors (education, health, land administration, law enforcement, the judiciary and tax authorities). Disaggregated by income categories, these estimates suggest low-income households lost 4.1 percent, middle-income households 3.6 percent, and high-income households 2.4 percent of annual income.

There is also evidence some sectors central to climate policy and adaptation – for example, forest and environment, and disaster management and relief – suffer from corrupt practices. TIB's Corruption Database 2005, which utilises and verifies reports of corruption published in leading newspapers, suggests forest and environment was one of the most corrupt sectors in Bangladeshi society. Almost 90% of individuals reportedly involved in corrupt practices in this sector were government officers/employees, with

Table 1
Extent of corruption in Bangladesh's service sectors, June 2009–May 2010.

Sector	Proportion of households receiving services who experienced corruption (%)	Proportion of households receiving services who paid bribes (%)	Average amount of bribe paid (in Taka)	National estimate of bribes paid (in millions of Taka)
Judiciary	88.0	59.6	7918	16192
Law enforcement agencies	79.7	68.1	3352	5014
Land administration	71.2	67.0	6116	35194
Tax, VAT & customs	51.3	43.9	6734	2235
Electricity	45.9	27.6	1834	8126
Local government	43.9	36.7	913	6283
Health	33.2	13.2	463	1691
Banking	17.4	12.7	1928	3927
Education	15.3	15.0	168	1087
NGO	10.1	7.2	549	422
Others	34.1	35.5	6804	11570
Overall	84.2	71.9	4834	95916

Source: TIB (2010).

62% of reported cases involving the abuse of power (a composite term encapsulating extortion, favouritism/nepotism/patronage, influence peddling, and procurement irregularities), followed by bribery (22%) and asset stripping (8%). The database also suggests the disaster management and relief sector suffered from lower levels of corruption. In this sector, 91% of individuals allegedly involved in corruption were elected representatives with 54% of alleged cases involving the abuse of power and 37% bribery. Before reporting our findings on corruption in pre- and post-disaster interventions associated with Cyclone Aila, we discuss the intrinsic difficulties of generating accurate data on corruption, and the research methods and statistical techniques employed.

3. Researching corruption, methods and statistical techniques

Measuring corruption is very challenging. Not only is it a 'hidden' phenomenon, but corrupt practices are manifestations of broader systemic failures which condition actors' behaviour (Duncan and Dutta, 2006). In this respect, abstracting isolated incidents of corruption from wider processes risks misunderstanding its impact (ibid.). That said, certain research approaches can improve the likelihood of accurately measuring and understanding the phenomenon. For example, Reinikka and Svensson (2006) detail how precise definitions, triangulation with qualitative methods and formal hypothesis testing can improve the data generated (on this last point, see Olken, 2007, for an innovative experimental approach). Our approach in this article – to elicit information from beneficiaries of pre- and post-disaster interventions – resonates strongly with the first two of these 'principles'.

In this respect, we explicitly differentiate the nature of corruption we investigated, and clearly state whether data is first or second hand. In what follows, the extent of corruption is measured by both its frequency (the proportion of beneficiaries affected, or who claim corruption took place) and its severity. There are two aspects to the severity of each practice. First, the income/opportunities lost as a consequence of corrupt practices. This is detailed where possible. Second, the vulnerability of victims. Because corruption in pre-disaster interventions took place before households' vulnerability was exacerbated by Cyclone Aila such practices have been allocated a 'mild' rating. In other words, perpetrators were not certain their actions would harm (for they were not fully aware of the imminent risk). In contrast, corrupt practices in post-disaster interventions have been allocated a 'severe' rating as such practices occurred after households were in acute distress. In other words, perpetrators were fully aware their actions would harm (and as such were especially callous). We also need to be clear about first- and second-hand accounts of corruption. Needless to say, only data about respondents' own experience of corruption can be treated as robust. The only occasion we utilise second-hand hearsay data is regarding government attempts to reconstruct embankments (and the reader is advised to be cautious about these results).

Fieldwork was conducted in collaboration with the Coastal Research Foundation (CRF) during June/July 2010. A household survey, focus group discussions (FGDs) and key informant interviews (KIIs) were conducted. It should be noted the study area is remote with little infrastructure or law and order. Before entering the field it was essential to develop a good network with law enforcement agencies and elites to ensure the security of the research team. Unsurprisingly in such a context, some respondents were nervous or were interrupted by friends or family members during the interview. These questionnaires were excluded from the analysis.

The survey was conducted in one upazilla in Khulna, due to the severe impact of Aila on this part of the coastal belt. A three-stage random sampling technique was followed: one union was randomly selected from the upazilla; four wards were randomly selected from the union; and 75 households were randomly selected from each ward. As a sampling frame was not available in this post-disaster setting, we utilized a transect approach. Depending on the population size in the ward, every fifth to ninth household was selected. The study aimed to sample 300 households, but during data cleaning 22 questionnaires were excluded as the veracity of responses was questionable. Eight experienced assistants were recruited and trained for the survey. Each enumerator surveyed six to seven households per day. Questionnaires were checked each evening by the lead researcher and unsuitable questionnaires returned. In cases where the household head was not available, subsequent visits were made. If the household head was still not available, an adult decision maker was interviewed.

Survey data was triangulated with three focus group discussions conducted with different community groups: women, the social elite (school teachers, religious leaders, public officers, and businessmen), and farmers/day labourers (averaging ten participants). Seven key informant interviews were also conducted during and after the survey to assess corruption in disaster management. Informants included the Member of Parliament, chairmen of upazilla parishad and union parishad, government officers, a representative from a civil society organisation, and journalists. Semi-structured checklists were used during both FGDs and KIIs.

To enable the comparison of corruption across wealth categories, we utilised an asset index. Different authors suggest various methods and techniques to construct such indices (for example, see Filmer and Pritchett, 2001; Hulme and McKay, 2005; Moser and Felton, 2007), and they are being utilised with increasing frequency (see, for example, Ansoms and McKay, 2010; Dasgupta and Baschierri, 2010; Marivoet and Keje, 2011). A recent overview of applications is offered by Harttgen and Klasen (2012) who argue asset indices can be seen as robust proxies for income/expenditure data (but not consumption data, see Howe et al., 2009). As such, they argue whilst asset indices are not perfect proxies they provide a good indicator of long-term living standards.

We utilised principal components analysis (PCA), a data reduction technique to summarise an original set of variables to a set of uncorrelated components. Such an approach offers a straightforward and parsimonious way of assessing wealth, and arguably vulnerability and adaptive capacity (see Adger et al., 2004; Rygel et al., 2006). Our sample size of 278 households is sufficient for PCA (Tabachnick and Fidell, 2007). We used the Sustainable Rural Livelihoods framework as a guiding tool (Chambers and Conway, 1992; Carney, 1999). Under this framework five types of capital assets are distinguished: human capital, socio-political capital; natural capital; physical capital; and financial capital. Under these five capitals, we used 17 variables from reported data on asset holdings before Aila:

- Human capital: years of education of household head.
- Social/political capital: social and political connections of households (whether they take part in salish – a social system for informal arbitration of petty disputes; are a member of a school management/religious committee; or have relatives among government officers, journalists, or public representatives).
- Natural capital: total cultivatable land (acres).
- Physical capital: type of housing structure and ownership of consumer durables/capital goods (TV, radio, bike, pots, table and chairs, mobile phone).
- Financial capital: average monthly household income.

Second, the variables within physical capital and socio-political capital were aggregated using nominal weights: monetary value for the former (apart from housing which also accrued a non-monetary value); authors' expertise for the latter. Third, we

ensured the five capitals were normally distributed and significantly correlated at the 99% level. Fourth, appropriate robustness checks were utilised to ensure data was suitable for Principal Components Analysis. The Kaiser–Meyer–Olkin Measure of Sampling Adequacy tested for the proportion of variance in the variables caused by underlying processes. The result of 0.74 is well within the necessary range for PCA (>0.5 and <1). The data also satisfied the Bartlett's Test of Sphericity (Approximate Chi-Square 251.968; d.f. 10; Sig. 0.000) which tested the hypothesis the correlations in the correlation matrix are zero (but which is very sensitive to sample size – see Tabachnick and Fidell, 2007).

As Table 2 shows, PCA extracted one component from the five capitals with the necessary eigenvalue of greater than 1 (again, see Tabachnick and Fidell, 2007). This component explained 47% of the variance in the original variables. The component score coefficients show the factor loadings applied to the five variables to construct the asset index (human capital 0.257, natural capital 0.287, socio-political capital 0.263, financial capital score 0.31, physical capital score 0.338). Fifth, the asset score was sorted in an ascending fashion and used to divide the households into four equally-sized wealth quartiles: ultra poor, poor, a middle group and the wealthy. We now turn to our findings, first on corruption in pre-disaster interventions.

4. Corruption in pre-disaster Interventions

Three pre-disaster interventions are now discussed: cyclone warning systems; disaster-preparedness training; and access to cyclone shelters. Each part assesses access to these services across the four wealth quartiles.

4.1. Cyclone warning systems

The survey found only 38% of households received a warning message before Aila (see Table 3). Looking into the wealth quartiles, a higher proportion of wealthy households received a message (55%) compared to poorer households (significant at the 99% level). For example, only 24% of ultra-poor households received one. Table 3 also shows households' perception of the suitability of warning messages before Aila, with 83% not considering messages as 'appropriate'. Looking into poverty quartiles, 93% of ultra-poor households through to 72% of wealthy households considered the messages as 'inappropriate' (significant at the 99% level). The survey also enquired about the different ways warning messages were received by households (see Table 4). Here, the difference between wealth groups is not substantial. For example, most of the poorest (46.7%) and wealthiest households (54.3%) received warning messages by radio or television, from the market place or from friends/relatives.

That many households did not receive a warning message poses questions about the effectiveness of early warning systems. Specifically, it suggests a negligence to provide services. Bangladesh has a good administrative set-up within local government. Along with the Weather Forecast Department and Disaster Management Committee at the local level, the union parishad (lower tier of local government) is responsible for the dissemination of warning messages by different means (including a microphone announcement). It appears many of these systems failed.

In addition, although 38% of households received a cyclone warning before Aila, they did not take it seriously enough. Participants in two FGDs explained as the height of the previous tidal surge during Cyclone Sidr in 2007 was over-estimated, many people under-estimated the height during Aila. In addition, Aila was only given a category 7 cyclone rating. As people in this upazilla are used to facing more serious threats, they did not give the warning message sufficient credence. Respondents also suggested businessmen, with the help of Water Development Board officials, had weakened the strength of embankments through cutting holes so saline water could allow shrimp cultivation. A high tidal surge, excessive water pressure and poor maintenance meant "*everything was destroyed within a single moment. Many people were washed away with the tidal surge, others were helpless struggling to survive*".

4.2. Disaster preparedness training

We now consider whether households attended disaster preparedness training before or after Aila. Table 5 shows only 14% of households attended a training session beforehand. This is a

Table 2
Total variance explained: principal component analysis.

Component	Initial eigen values			Extraction sums of squared loadings		
	Total	% of variance	Cumulative %	Total	% of variance	Cumulative %
1	2.337	46.736	46.736	2.37	46.736	46.736
2	.945	18.895	65.632			
3	.688	13.755	79.387			
4	.566	11.317	90.704			
5	.465	9.296	100.000			

Source: Authors' calculations.
Extraction method: principal component analysis.

Table 3
- Warning message before Aila by wealth quartiles.

Poverty Quartiles	Received warning message (%)			Appropriateness of Aila message (%)		
	Yes	No	Total	Yes	No	Total
Ultra Poor	24.3	75.7	100	7.2	92.8	100
Poor	44.3	55.7	100	20.3	79.7	100
Middle	29	71	100	11.6	88.4	100
Wealthy	55.1	49.9	100	27.5	72.5	100
Total	38.1	61.9	100	16.7	83.3	100
	$\alpha = 0.01$, d.f = 3, $\chi^2 = 17.65$			$\alpha = 0.007$, d.f = 3, $\chi^2 = 12.209$		

Source: household survey.

Table 4
Medium of warning message by wealth quartiles.

Wealth category (%)	Warning Message Received from			
	Market or friends or relatives	Radio or television	Mike announcement or mobile text message	Total
Ultra poor	45%	45%	10%	100%
Poor	39.5%	50%	10.5%	100%
Middle	28.6%	61.9%	9.5%	100%
Wealthy	31.9%	51.1%	17%	100%

Source: household survey, based on multiple responses.

Table 5
- Disaster preparedness training program before and after Aila.

Wealth quartiles	Disaster preparedness training/ program before Aila (%)			Disaster preparedness training/ program after Aila (%)			Irregularities in training program (%)			
	Yes	No	Total	Yes	No	Total	Yes	No	No response	Total
Ultra poor	10	90	100	21.4	78.6	100	22.9	35.7	41.4	100
Poor	17.1	82.9	100	12.9	87.1	100	35.7	28.6	35.7	100
Middle	8.7	91.3	100	17.4	82.6	100	40.6	24.6	34.8	100
Wealthy	21.7	78.3	100	29	71	100	24.6	44.9	30.4	100
Total	14.4	85.6	100	20.1	79.9	100	30.9	33.5	35.6	100
	$\alpha = 0.095$, d.f = 3, $\chi^2 = 6.367$			$\alpha = 0.109$, d.f = 3, $\chi^2 = 6.061$			Substantial proportion of non responses			

Source: Household survey.

surprisingly low figure for such a hazard-prone location. Again, looking into wealth quartiles, the greatest proportion is the 22% of wealthy households. Middle strata households (9%) attended less than both poor (17%) and ultra-poor households (10%) (the chi-squared statistic reports significance at the 90% level of confidence).

Table 5 also displays a slightly different picture regarding participation in training after Aila. Overall, 80% of households did not attend any training after the cyclone. Again, a greater proportion of wealthy households (29%) managed to attend, this time followed by the ultra poor (21%), middle households (17%) and poor households (13%) but these differences are not statistically significant ($\chi^2 = 6.061$, 3 degrees of freedom, (= 0.109). In addition, Table 5 illustrates the nature of irregularities in disaster preparedness training (based on those attending training sessions). It shows 31% of these households observed irregularities, particularly middle (41%) and poor households (35.7%). The most prominent irregularity was nepotism and the same people attending training sessions (Table 6).

4.3. Access to cyclone shelters

The survey enquired about respondents' access to cyclone shelters. Table 7 shows the types of shelter used by households during Aila: 58% took shelter on an embankment or at home and 32% in a union parishad/school/or other concrete building. Importantly, only 10% accessed a cyclone shelter, varying from 4.3% of ultra-poor households to 13% of wealthy households (these differences are not statistically significant). Table 7 also shows 31% were refused access to shelters with the greatest proportions coming from middle (38%) and poor (32%) households (again, these differences are not statistically significant).

Furthermore, the table highlights reasons for the lack of access to shelters. It shows 50% of responses pinpointed space constraints, and 41% referred to households not having enough time to reach shelters (which raises questions regarding the timing of early warning systems, as well as the location of shelters – on these points see Vogt et al., 2009). Only 9% of responses from households claimed space was reserved by the elite (although, interestingly, 25% of the ultra poor thought so).

Data from focus groups support these findings. For example, one participant from the women's group explained: "*due to space constraints many people did not get in a cyclone shelter. as they were far away from their house, or they previously had a bad experience. Most of the people were forced to take shelter on the embankment though it was not safe*". Overall, and despite the widespread negligence to provide warning messages about Aila, we find a relatively low level of 'mild' corruption in pre-disaster interventions compared to post-disaster relief interventions, to which we now turn.

Table 6
Types of irregularity in disaster preparedness training program by wealth quartiles.

Wealth quartiles	Types of irregularities in training program (%)		Total
	Nepotism/same people attended various training	Trainee selection based on political considerations	
Ultra poor	57.1	42.9	100
Poor	71.9	28.1	100
Middle group	67.7	32.3	100
Wealthiest	57.1	42.9	100

Source: Household survey, based on multiple responses.

5. Corruption in post-disaster relief interventions

Post-disaster relief interventions are particularly prone to corruption because of the swift, substantial flow of resources required to meet the pressing needs of affected households. Such relief programmes are sequential. First, short- and long-term recovery interventions bring immediate relief to affected households. Later, rehabilitation interventions, such as grants for house rebuilding and embankment reconstruction provide longer-term assistance. We discuss a number of interventions under each category. The first part focuses on post-disaster recovery interventions, the second rehabilitation interventions. Moreover, we discuss three types of government recovery schemes: first, emergency recovery relief (where households received Tk. 3000–5000); second, one medium-term relief intervention (where households received 20 kg of rice each month); and third,

Table 7
Access to types of shelter during Aila.

Wealth quartiles	Shelter taken during Aila (%)				Refused access to cyclone shelter (%)			Reasons for lack of access to cyclone shelter (%)*			
	Cyclone shelter	Union parishad/school/ other concrete building	Embankment/ at home	Total	Yes	No	Total	Reserved by social elite	No space	Not enough time to/other	Total
Ultra poor	4.3	25.7	70	100	25	75	100	25	33.3	41.7	100
Poor	10	38.6	51.4	100	32.1	67.9	100	12	52	36	100
Middle	13	30.4	56.5	100	38.9	61.1	100	3.7	59.3	37	100
Wealthy	13	34.8	52.2	100	26.8	73.2	100	0	43.8	56.3	100
Total	10.1	32.4	57.6	100	30.9	69.1	100	8.75	50	41.25	100
	$\alpha = 0.222$, d.f = 6, $\chi^2 = 8.23$				$\alpha = 0.422$, d.f = 3, $\chi^2 = 2.809$			*Percentages based on multiple responses			

Source: Household survey.

a longer-term social protection measure where households received cash/food in return for participating in public works. We also briefly discuss NGO post-disaster interventions. As outlined above, corruption in all these interventions received a 'severe' rating (due to the extreme vulnerability of recipient households).

5.1. Emergency recovery relief (Tk. 3000–5000 per household)

After Aila, government stated it would provide Tk. 3-5,000 (US$ 43-72) to each affected household to meet immediate basic needs (with the amount depending on damage to housing stock). Table 8 shows 97% of households received this relief (with little variation by wealth quartile). However, Table 8 shows a higher proportion of wealthy households (19.4%) received more than the stipulated single card (significant at the 99% level of confidence). This was because household size was the main criteria for allocating cards (with households with six or more members receiving two, twelve or more receiving three) and the average size of households increases through wealth quartiles (from 4.33 to 5.09). However, Table 8 does outline more ultra-poor households (8%) were forced to pay bribes compared to other wealth categories (significant at the 90% level of confidence) and paid larger bribes than other categories (again significant at the 90% level). Thus, survey data suggests the programme did suffer from a low level of corruption. Interestingly, it also reveals a substantial proportion of actors receiving bribes were not local government representatives – such as union parishad members (30%) and chairmen (10%) – but middlemen (60%).

Qualitative methods highlighted how further local officials saw an opportunity from this relief programme: the local land tax collector and chief administrative officer attempted to collect outstanding land taxes from the cash transfer. Whilst a media campaign and interventions by the Member of Parliament and upazilla chairmen stopped this opportunistic taxation, no action was taken against the actors involved. We now turn to corruption in medium-term recovery relief.

5.2. Medium-term recovery relief (20 kg rice per household)

Following the immediate payment of cash transfers to households, government provided 20kgs of rice per month for each household affected by Aila. Table 9 shows 98% of households received this recovery relief. Slightly fewer ultra-poor households received rice compared to other quartiles. More importantly, survey data shows 99% of households received less rice than they were entitled to, with an average loss of 9% (similar across wealth categories). Again, households were asked which actor was involved in this form of corruption. Survey data shows 74% of households suffering from this corrupt practice reported union parishad members were responsible (followed by 20% of households citing union parishad chairmen, and 6% reporting middlemen).

Qualitative research methods examined whether there were consistent rules and regulations in both emergency and medium-term recovery relief. Informants stated members and chairmen of union parishad hold high levels of discretionary power to allocate relief cards and distribute goods. For example, one participant explained *"nobody received according to their entitlement…even if the chairman or member said that one card will be given for 6 members of a household, two cards for the members who are more than 6 and 3 cards for 12 members or above, this rule varied from person to person. The cronies of chairmen or members got more benefit from them"*. But when we compare the amount of rice received across categories on a per adult equivalent basis – ultra-poor households 5.59 kgs, poor households 5.21 kgs, middle households 4.91 and wealthy households 4.87 – we find wealthier households actually received less than poorer households (an analysis of variance shows this is not statistically significant: dfs = 3, 267 F ratio = 1.629, F test = 0.183). Whilst there may have been cases where union parishad chairmen or members distributed cards as a form of patronage, the greater number of cards received by wealthy households was due mainly to household size, not favouritism. We now turn to the last post-disaster recovery interventions: a public works programme.

Table 8
Emergency recovery relief (Tk. 3000–5000 per household).

Wealth quartile	Receipt of emergency recovery relief (%)			Number of relief cards received (%)				Forced to pay bribes (%)			Average bribe paid
	Yes	No	Total	One	Two	Three	Total (%)	Yes	No	Total (%)	(Taka)
Ultra poor	95.7	4.3	100	97	3	0	100	7.7	92.3	100	1890
Poor	98.6	1.4	100	89.9	10.1	0	100	1.5	98.5	100	1000
Middle	97.1	2.9	100	98.5	1.5	0	100	4.6	95.4	100	350
Wealthy	97.1	2.9	100	79.1	19.4	1.5	100	0	100	100	0
Overall (%)	97.1	2.9	100	91.1	8.5	0.4	100	3.4	96.6	100	1277.8
	$\alpha = 0.796$, d.f = 3, $\chi^2 = 1.023$			$\alpha = 0.002$, d.f = 6, $\chi^2 = 20.584$				$\alpha = 0.077$, d.f = 3, $\chi^2 = 6.838$			dfs = 2, 6 F ratio = 3.912 F test = 0.08

Source: Household survey.

Table 9
Medium-term recovery relief and cash/food for work.

Medium-term recovery relief (20 kg rice per household)					Cash/food for work									
Wealth quartiles	Received 20 kg rice (%)			Missing rice (% of total)	Involvement in cash/food for Work programme (%)			Types of irregularities* (%)					Bribe paid or wage lost	Loss in wage/bribes (% of monthly income
	Yes	No	Total		Yes	No	Total	Wage stripping	Delayed/ Uncertain Payment	Low quality of work/misuse of resources	Bribery	Total	(Taka)	
Ultra poor	94.3	5.7	100	−9.43	75.7	24.3	100	45.2	35.5	14	5.4	100	1548.9	77.12
Poor	97.1	2.9	100	−9.52	90	10	100	36.1	39.2	22.7	2.1	100	1520.9	66.32
Middle	98.6	1.4	100	−9.34	84.1	15.9	100	31.1	46.6	17.5	4.9	100	1316.5	63.97
Wealthy	100	0	100	−8.81	68.1	31.9	100	41.9	35.5	20.4	2.2	100	2596.8	98.19
Overall (%)	97.5	2.5	100	−9.28	79.5	20.5	100	38.34	39.4	18.65	3.63	100	1765.5	76.54
	$\alpha = 0.168$, d.f = 3, $\chi^2 = 5.050$				$\alpha = 0.008$, d.f = 3, $\chi^2 = 11.716$			*Based on multiple responses					dfs = 3, 78 F ratio = 1.424 *F* test = 0.242	

Source: Household survey.

Table 10
Irregularities in NGO relief interventions.

Wealth quartile	Irregularities in NGO relief (%)		Total	Types of irregularities (%)*				Total
	Yes	No		Bribery/stripping	Nepotism	Influence peddling	Low quality goods	
Ultra poor	47.8	52.2	100	24.1	19	46.6	10.3	100
Poor	58.6	41.4	100	15.4	29.5	35.9	19.2	100
Middle	69.6	30.4	100	19.8	32.7	34.7	12.9	100
Wealthy	79.7	20.3	100	17.9	35.8	32.1	14.2	100
Overall	63.9	36.1	100	18.95	30.61	36.15	14.29	100
	$\alpha = 0.001$, d.f = 3, $\chi^2 = 17.026$			*Based on multiple responses				

Source: Household survey.

Table 11
Nature and extent of corruption in pre- and post-disaster interventions.

Stage	Intervention types	Type of evidence: hearsay/own experience	Nature and extent of corruption					
			Severity of corrupt practice: mild/severe	Incidence of corruption[a]	Type/s of corruption	Bribery paid or relief received (taka or %)	Primary actor (s)	Primary victim
Pre-disaster interventions	Warning message	Own experience	Mild	Very high (83%)	Negligence to provide services	NA	Government Officer, Public Representative	Ultra poor
	Disaster preparedness training	Own experience	Mild	Medium (31%)	Nepotism/favouritism/patronage	NA	Government officer	Middle and poor
	Access to cyclone shelter	Own experience	Mild	Low (9%)	Influence peddling	NA	Social elite	All
Post-disaster interventions	Emergency recovery relief	Own experience	Severe	Low (exclusion – 3%; bribery – 3%)	Negligence to provide services, bribery/stripping	Tk. 1277	Exclusion: members and chairman of union parishad bribes: middlemen	Ultra poor
	Mid-term recovery relief	Own experience	Severe	Very high (exclusion – 3%; stripping – 99%)	Bribery/stripping, negligence to provide services	9.28%	Members and chairman of union parishad	All
	Cash/food for work	Own experience	Severe	High (68%)	Bribery/stripping, misuse of resources, fraud	Tk. 1765	Middlemen; member and chairman of union parishad	Wealthy
	Embankment reconstruction	Hearsay	Severe	Very high (94%)	Misuse of resources, bribery stripping, procurement irregularities, negligence to provide services	Estimated by key informant to be 40–55% of total project	Syndicate of ruling party activists	All
	NGO interventions	Own experience	Severe	High (64%)	Influence peddling, nepotism/ favouritism/patronage, bribery/stripping	Tk. 627	Middlemen, NGO officers, member and chairman of union parishad	Wealthy

[a] incidence of corruption: low = <25%; medium = 26–50% incidence of corruption; high = 51–75% incidence of corruption; very high = >75%.

5.3. Cash/food for work interventions

As land in the upazilla was flooded with saline water, reduced labour demand forced many mobile residents to migrate to find work. To tackle this situation, government launched a cash/food-for-work scheme. Overall, 80% of households participated in the scheme at some stage, with a greater proportion of poor and middle households than ultra-poor and wealthy (statistically significant at the 99% confidence level, see Table 9). However, the scheme was plagued by discrepancies. Overall, 68% of respondents reported irregularities, particularly with wage stripping and delayed or uncertain payment (see Table 9).

Qualitative methods examined these irregularities. One focus group complained the enrolment list for the scheme, created on the first day, was not updated as the number of workers decreased, that chairmen of the union parishad added false names, and that labourers did not receive a fixed amount of rice. Table 9 shows the average wages lost or bribes paid by households in this scheme came to Tk. 1766 (US$ 25). Looking into wealth quartiles, wealthy households lost more wages (both in absolute terms and as a proportion of monthly income) compared to other groups.

A further issue highlighted by focus groups was the low quality of work conducted on the scheme. For example, one participant reported: *"the work was awarded to inexperienced sub-contractors. They do not know how to reconstruct roads, dams or embankments especially in the coastal belt. After finishing some work, the roads/embankments were just washed away by a tidal surge. They used this as an excuse not to pay wages to workers".*

Overall, recovery relief after Aila suffered from varied levels of corruption: low levels of bribery in the Tk. 5000 programme; very high levels of asset stripping by union parishad chairmen and members in the food distribution programme; and high levels of wage stripping and delayed/uncertain payment, as well as other irregularities, in the public works programme. We now turn to corruption in one post-disaster rehabilitation intervention.

6. Rehabilitation intervention

Here we consider one major government programme: embankment reconstruction. In July 2009, the Ministry of Food and Disaster Management allocated Tk. 1150 million (US$ 16.4 million) to the Water Development Board for the repair of vital embankments damaged or destroyed in Aila. This section examines people's perceptions about government's steps to reconstruct embankments, and tries to identify the extent of corruption in this intervention. As highlighted above, because this data is not based on direct experience but on hearsay we need to be cautious about these findings.

The first point to note is the Water Development Board failed to commence embankment reconstruction promptly. For example, on 7th April 2010, the Prime Minister criticised officials for this failure (The Daily Star, 2010). The Prime Minister's dissatisfaction is reflected in respondents' perceptions: 82% did not feel necessary action had been taken to reconstruct embankments after Aila, and almost 60% were fully dissatisfied with the government's response. Two focus groups stated a clear preference the army should have been deployed from the start for this vital task.

Survey data shows 94% of respondents reported irregularities in the embankment reconstruction process including the misuse of resources, low quality of work and corrupt tendering. The political mechanisms at work here were hard to untangle. It was reported the main contractor was prevented from working due to pressure from a cadre within the ruling political party. Moreover, it was stated the contractor was forced to sub-contract to this cadre: in other words, it was alleged local government representatives, party activists and wealthy households, under the protection of the Member of Parliament, formed a syndicate which was sub-contracted to complete the work. Due to time pressure, the research could not pursue this line of enquiry. We now turn to the final post-disaster intervention: NGO programmes.

6.1. NGO post-disaster interventions

The survey found 98% of households received some kind of relief (in cash or in kind) from NGOs (ranging from 100% of ultra-poor households to 94.2% of wealthy households, significant at the 95% level). Overall 64% found irregularities in NGO operations, with, interestingly, wealthy households (80%) reporting the greatest incidence of corrupt practices (significant at the 99% level with one non response excluded). Table 10 also shows influence peddling by representatives and nepotism were the most common irregularity, followed by bribery and asset stripping. In addition, the quality and appropriateness of goods distributed by NGOs was questioned. For example, one participant in a FGD stated "*most often the relief goods were not suitable for Bangladesh considering the socio-economic condition. For example, they gave mosquito nets which are washable only in a machine, and they gave tents which are not suitable for high temperatures so get damaged within a few months due to the hot weather and rain.*"

The amount paid in bribes by twenty three households varied across the poverty/wealth categories. On average, ultra-poor households paid Tk. 325, poor households Tk. 330, middle households Tk. 438 and wealthy households Tk. 1040 (dfs = 3, 19 F ratio = 1.62 F test = 0.218). Over half these households paid this bribe to a middleman, with the remaining households either paying an NGO officer or a member/chairman of the union parishad.

7. Discussion

Almost every household surveyed reported losses from corrupt practices before or after Aila. The key findings are summarised in Table 11. Overall, whilst poorer households were affected more by 'mild' corruption in pre-disaster interventions, the incidence of corruption in these schemes was lower than in post-disaster operations, especially food aid distributions and public works. Interestingly, wealthy households were affected more by the 'severe' corruption after Aila, especially within public works and non-governmental interventions. These findings contrast with Iftekharuzzaman's (2009) national findings where poorer households bore the brunt of corrupt practices (due to the higher proportion of income spent). Our findings also highlight different types of corruption before and after Aila: negligence to provide services and nepotism were most common within pre-disaster interventions. In post-disaster interventions, wage/asset stripping, bribery and the misuse of resources were most prevalent.

8. Conclusion

Broadening out from this particular case, these findings may hold relevance for agencies involved in adaptation. Bangladesh is frequently applauded for efforts to mainstream adaptation into policy (such as through integrating climate concerns into the Poverty Reduction Strategy Paper) and creating the necessary funding mechanisms to absorb large climate resource flows (such as the National Climate Change Trust Fund and Climate Resilience Fund). Vibrant civil society organisations in Bangladesh have supported autonomous adaptation initiatives such as community-based adaptation (for example, see Huq and Reid, 2007). However, our findings suggest without increasing integrity, hard-won funding will not increase the resilience of poor households and communities to the extent it might.

This is because there is considerable overlap between the eight interventions assessed here and the adaptation pillars highlighted by the Climate Change Strategy and Action Plan, and early projects financed by Climate Change Trust Fund and Climate Resilience Fund. For example, the Climate Change Strategy and Action Plan covers a ten-year period (2009–2018) implemented in two phases: 2009–2013 and 2014–2018 (MoEF, 2009). In the first phase government highlighted six pillars, the first three of which resonate with the cyclone preparedness and relief efforts evaluated in this article: food security, social protection and health; comprehensive disaster management; infrastructure; research and knowledge management; mitigation and low carbon development; and capacity building & institutional strengthening (MoEF, 2009:27–32). Moreover, the funding allocation under the Climate Change Trust Fund shows a distinct focus on disaster preparedness and relief efforts. Of the US$95.36 million allocated to projects as of December 2011, over US$56 million was directed to projects under the first three pillars of the Strategy and Action Plan. Indeed, the first approved project was US$25 million for constructing cyclone shelters. The budget allocations under the Climate Change Trust Fund also show the Water Development Board as the ministry receiving the greatest proportion of funds, the same body which 94% of respondents alleged was involved in corrupt practices during embankment reconstruction. Turning to the Climate Resilience Fund, some initial projects also reflect similar disaster preparedness priorities, including the construction of cyclone shelters.

The precise anti-corruption measures that might work within adaptation projects are not easy to discern. For example, the literature on corruption outlines generic approaches such as extra payments to civil servants to increase honesty (so-called efficiency wages), increased competition between public officials, increased monitoring and sustained public awareness campaigns (see Bardhan, 1997). Olken (2007) usefully contrasts such traditional, top-down instruments with grassroots, local-level monitoring (for example, the use of social audit tools, or supporting transparent and competitive procurement systems through engaging civil society in tendering and selection processes). In the Indonesian case Olken (2007) examined, the conventional threat of a top-down audit reduced corruption to a greater extent than bottom-up local-level monitoring. It may well be the case that experimenting with specific anti-corruption measures in Bangladesh could shed light on effective remedies. Whilst only a first step, such analysis could assist government, non-governmental organisations and development partners in formulating a range of innovative measures during implementation.

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