

Systematic Study of Cyclone Aila Recovery Efforts in Koyra, Bangladesh Highlighting the Possible Contribution to Vulnerability Reduction

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Abstract

Cyclone Aila struck Bangladesh in 2009. Disaster managers and researchers agree that the pre-Aila vulnerabilities of the affected areas were the major reasons for the devastating damage and prolonged suffering caused by the cyclone. Since the cyclone hit, a large number of humanitarian organizations and different government departments have been working on post-cyclone recovery. This study systematically investigated the Aila recovery mechanism, taking Koyra Upazila as a case study area. Through a process of institutional surveys, expert interviews, and focus group discussions with local people, this study examined the implemented recovery measures in the context of pre-Aila vulnerability reduction. One of the findings is that the present NGO coordination mechanism does not ensure coordinated recovery efforts at the local level. Another finding is that, the adopted recovery measures are mostly low to moderate contributors to vulnerability reduction. The community was afraid that a cyclone similar to Aila would cause severe damage in the future. This study advocates long-term viable measures to eliminate the root causes of pre-disaster vulnerabilities.

Key words : Disaster Response, Reconstruction, Aid, NGO Coordination, Vulnerability

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1. INTRODUCTION

Although Bangladesh has a long history of surviving cyclones (Alam and Collins 2010) and has made significant progress in disaster management, conducting evacuations and saving lives (Haque et al. 2012), further efforts are required for post-disaster recovery. This study reviews the cyclone recovery mechanism in Bangladesh taking Cyclone Aila as a case study and Koyra Upazila of Khulna as the study area. Cyclone Aila was a ‘Severe Cyclonic Storm with a core of hurricane winds’ with a maximum intensity of 65 knots (JTWC 2009) as per the cyclone classification of Bangladesh Meteorological Department (Debsarma 2009), which is similar to Category I as per the Saffir-Simpson Hurricane Scale (IFNet 2009). It struck the south-western coast of Bangladesh on 25 May 2009 with a 2 m - 6 m storm surge (ECHO 2009; IFNet 2009) (Fig. 1). It reached a maximum wind speed of 65 knots and a minimum sea level

pressure of 974 mb (JTWC 2009) and made landfall a few hours after reaching this maximum intensity (Harwood 2012). Although it was a weak cyclone, the economic cost and extent of people’s suffering outweighed the impact of the recent SSuper Cyclone Sidr (Ahmed et al. 2016). Immediately after the disaster, government and international humanitarian organizations (HO) responded with emergency aid and recovery support (UNDP 2010). This study examined the recovery initiatives from the context of their contribution to vulnerability reduction (VR).

2. METHODOLOGY

2. 1 Study Area

Koyra Upazila was selected as the case study area (Fig. 1) because of the severe damage caused by Aila, the prolonged suffering due to the long delay in recovery of the coastal polders, and the involvement of a large number of humanitarian or-

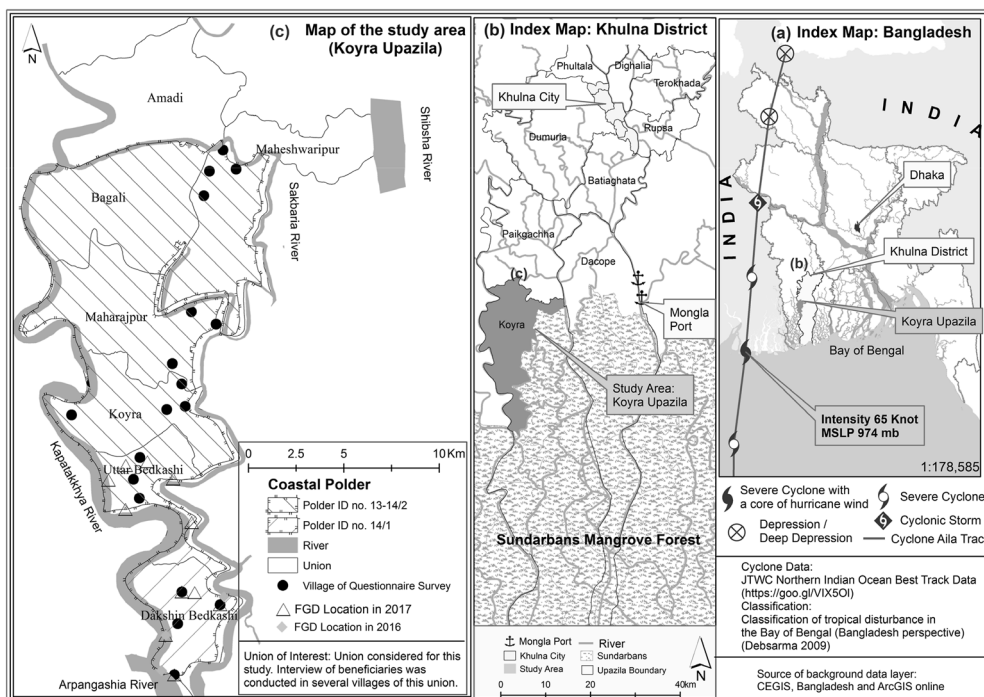


Fig. 1 Map of the study area and location of FGDs

ganizations (HO), development partners (DP) and non-government organizations (NGOs) (Roy et al. 2009; UNDP 2010). Koyra Upazila is located in Khulna district of Bangladesh. It is surrounded by two large rivers (Kapatakkhya and Sakbaria) and the world's largest mangrove forest Sundarbans. At the time of Aila, the entire Upazila was flooded by a storm surge, which resulted in the complete destruction of 23,820 houses, 502 arable farms and 20,300 acres of shrimp farms (ECHO 2009). Although this study focused on Koyra Upazila, the study findings are applicable to other similar coastal areas of Bangladesh.

2. 2 Approach and Methods

This study adopted a composite methodology, which included an institutional survey, focus group discussions (FGD), and expert interviews.

2. 2. 1 Institutional survey

An institutional survey was conducted to identify different NGOs and government departments involved in the recovery process in Koyra. A snowball technique (Goodman 1961) was adopted, and different project documents were scrutinized to identify different institutes. Then, responsible persons from seven major NGOs including the International Federation of Red Cross and Red Crescent (IFRC), Islamic Relief, Muslim Aid, Save the Children, Caritas, and two local NGOs were interviewed.

2. 2. 2 Focus group discussions

In Koyra Upazila, Uttar Bedkashi and Daskin Bedkashi were the two most severely affected unions where a large number of HOs were involved along with different government departments for response and recovery. A total of 14 FGDs (3 in 2016 and 11 in 2017) were conducted in these two unions (Fig. 1). A structured questionnaire was followed to grasp the cognition and perception of

local people during the FGDs. FGD locations were selected considering three criteria-i) an area severely damaged by cyclone Aila, ii) an area where major recovery initiatives were implemented and iii) accessibility.

2. 2. 3 Expert interviews

Expert interviews were conducted to grasp opinions on each major recovery initiative. Experts were selected from NGOs that played major roles and implemented large-scale Aila recovery projects in Koyra. Four NGOs (IFRC, Save the Children, Muslim Aid and Pradipan) were selected. A mid-level responsible professional from each of these four NGOs who was directly involved in the recovery efforts was interviewed. In addition, a researcher of Ritsumeikan University, Japan (presently works in JICA) who had field research experience on the Aila response and reconstruction efforts in Koyra (Tada 2011) was interviewed.

3. STORYLINE OF AILA RECOVERY INITIATIVES IN KOYRA

3. 1 Humanitarian-Aid-Driven Response and Recovery

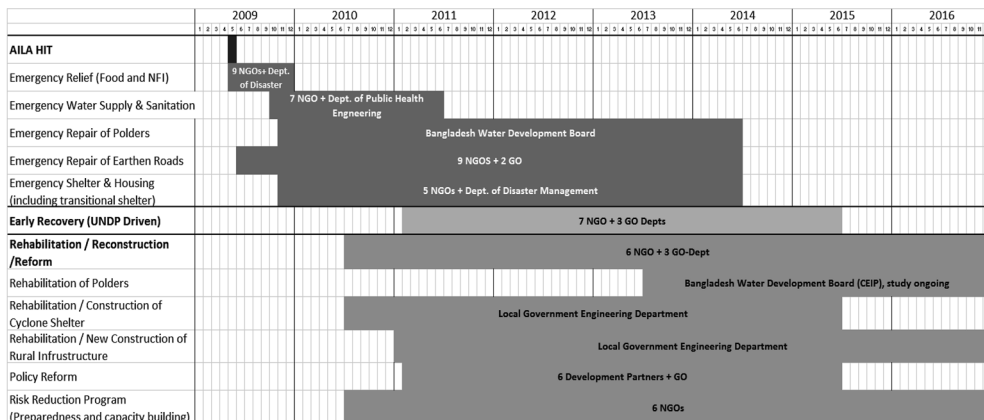
Immediately after the cyclone hit, the international community provided humanitarian aid, including emergency relief (food and non-food items, shelter packages) and the government provided humanitarian assistance of free rice, cash grants, and food assistance (UNDP 2010). Eventually, followed by a joint needs assessment (ECHO 2009), HOs also supported the provision of emergency shelters, transitional housing, emergency water supplies and sanitation, cash grants (for work and training) and emergency health (Roy et al. 2009; Tada 2011; UNDP 2010). Emergency repairs of rural roads under 'Cash for Work' and 'Food for Work' programs were delayed and affected several times due to delays in emergency repairs of embankments. Emergency repairs of polders and ru-

ral roads were finally completed in 2014. For emergency rehabilitation of the rural infrastructure, the UNDP modified an ongoing project for Cyclone Sidr recovery (Emergency 2007 Cyclone Recovery and Restoration Project, ECRRP) and included the Cyclone Aila affected area in 2013 (World Bank 2013). The UNDP led a multi-donor fund for 'Early Recovery Facilities (ERF)' to support housing construction, formulation of new policies and guidelines on the emergency response, capacity building, disaster risk reduction, etc. (UNDP 2011). Delay in polder repairing also delayed housing support projects. In some places in Koyra, new houses were constructed while some areas were still exposed to tidal flooding. The storyline of Aila recovery in Koyra is depicted in Fig. 2 where major activities are shown with timelines and the implementing agencies. This storyline with a timeline was developed from information collected by the institutional survey and project completion reports of NGOs.

3. 2 Recovery of Coastal Polders

After long efforts to obtain funding from the World Bank, the Bangladesh Water Development Board (BWDB) initiated Coastal Embankment

Improvement (CEIP) in 2013 to improve coastal embankments, which is still in the study phase. Under the umbrella of ERF, the Embassy of the Kingdom of the Netherlands (EKN) formulated another project titled 'Improved Resilience of Coastal Communities through Rehabilitation of Coastal Embankments' (EKN and UNDP 2015) in Koyra. However, the EKN funded project was delayed due to an issue of integration with other projects of BWDB, and finally ended up rehabilitating only 2.92 km of embankment. It was clear from the multi-sectoral needs assessment (UNDP 2010) and project reports of UNDP's early recovery facilities (UNDP et al. 2013) that the coastal polders were the central focus of all recovery initiatives. However, the coastal polders have not been completely restored. The emergence of coastal polders as a central focus is not a good indication because it increases dependency on the polders. In the last two major devastating cyclones, Sidor and Aila, these coastal polders only served as the first line of defense and eventually collapsed as a result of the rising storm surge (Kibria and Khan 2017). Therefore, dependency on coastal polders gives a false sense of security.



Note: GO = Government, NGO = Non-Government Organizations

Fig. 2 Timeline of Cyclone Aila recovery in Koyra

4. COORDINATION MECHANISM OF HUMANITARIAN AID FOR RECOVERY

4. 1 National Level Coordination

Following the Paris Declaration (2005), Bangladesh established the Local Consultative Group (LCG), which is the key coordination structure at the national level (Walton-Ellery 2009). The LCG consists of 18 thematic working groups. Each working group is jointly chaired by the relevant ministry and a development partner (DP). Among the 18 working groups, Disaster Emergency and Response (DER) coordinates among all DP, HOs and NGOs that are working in the disaster sector. The LCG structure in practice only enables a platform for communication and consultation, which may result in good cooperation, but does not ensure coordination, in-depth dialogue, and alignment to national priorities and policies (Rahaman and Khan 2010).

4. 2 Delivery of Humanitarian Assistance

Under the DER structure, the Humanitarian Coordination Task Team (HCTT) is responsible for coordinating humanitarian work, early recovery and resilience. In addition, the HCTT coordinates with other clusters i.e. Food security, nutrition, health, water supply and sanitation, education, early recovery, logistics, shelter and child protection, which are represented by different UN bodies.

In this aid-driven response and recovery effort, NGOs work as the delivery agent for DPs as illustrated in Fig. 3(a). At the time of a disaster, different DPs from different clusters contract their partner NGOs to deliver their support to the local community. For quick implementation, a DP splits their humanitarian assistance into several components or work packages and contracts several NGOs to implement those components. The same NGO can be contracted by several DPs. A DP works in multiple clusters and in each cluster mul-

iple DPs work together. Rather than integrating all humanitarian assistance projects into one large program, different DPs implement their projects independently by contracting a number of NGOs. As a result, the number of NGOs and the number of projects at the local level (which is Upazila in this case) dramatically increases. In the case of the response and recovery efforts after Aila, we identified 14 NGOs contracted by 10 DPs from 8 clusters. Maintaining coordination among these large numbers of NGOs and monitoring their work became an unmanageable task for the local government of Koyra during the response and recovery period.

4. 3 Local Level Coordination

As illustrated in Fig. 3(c), coordination among NGOs at the Upazila level is maintained by the UNO (Upazila Nirbahi Officer, the chief executive officer of the Upazila Government). The UNO officer maintained coordination by arranging a monthly coordination meeting. The UNO officer assigned an NGO to coordinate with others and to prepare a combined report of activities to present in the meeting. All the NGOs were required to receive a certificate from the UNO. Since it was not possible for the UNO to monitor directly the activities of NGOs without any additional capacity, his office only judged an NGO by its regular presence in the coordination meeting and issued the 'Certificate of Project Completion.' The responsibility for overall monitoring of NOGs activities was given to the Project Implementation Officer (PIO) of the Department of Disaster Management at the Upazila level (Fig. 3, c). However, without any additional resources and manpower, the PIO could only maintain close communications with NGOs. Thus, this mechanism did not ensure coordination. From the interview with representatives of the major six NGOs involved in Koyra recovery efforts and two NGO coordinators, it was understood that this

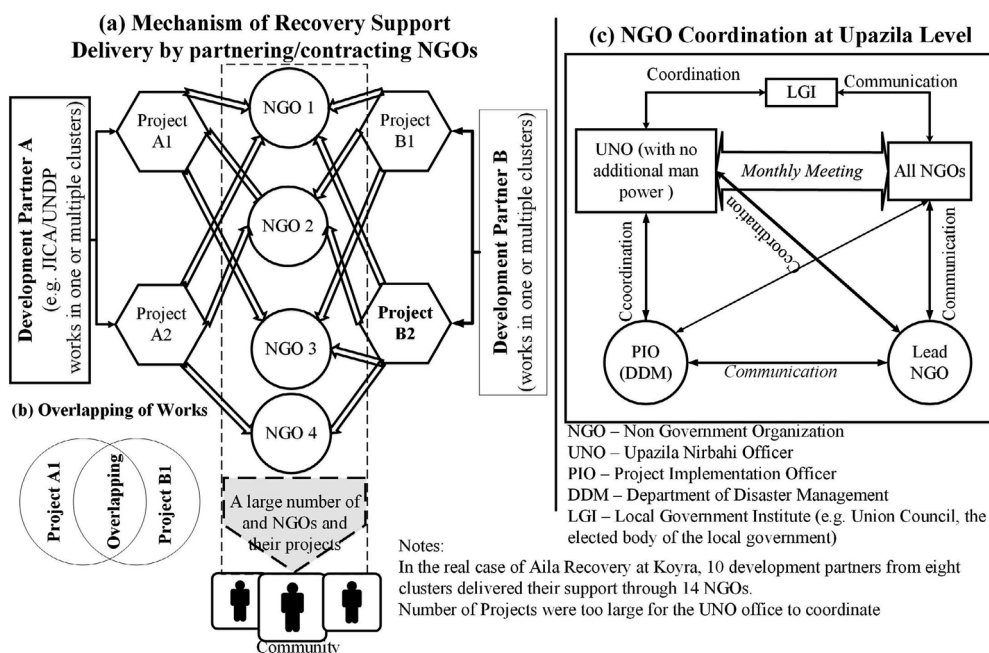


Fig. 3 Foreign aid driven recovery activities coordination mechanism at upazila level

mechanism only ensured sharing of general information among the NGOs. Most of these NGOs are competitors. They compete with each other to gain contracts for new projects from funding agencies. As a result, they tend to withhold information on notable features, strengths and innovative thinking of ongoing projects to secure their competitiveness for the future. Thus, the original objective of the coordination meeting could not be achieved. A similar situation occurred in the case of Aila recovery in Koyra, which eventually ended up in un-coordinated recovery efforts, corruption, and some areas being overlooked during recovery planning and implementation (Mahmud and Prowse 2012). During the FGDs, local people repeatedly mentioned issues of corruption and misuse of power. To avoid corruption and misuse of power, the NGOs adopted a participatory approach of selecting beneficiaries where they conducted a series of meetings with local people in the presence of representatives from local government institutes.

The list of beneficiaries was prepared very publicly and transparently (as reflected in the discussion in FGDs). However, local people claimed that the prioritization and selection of villages for implementing humanitarian support e.g. housing was influenced by powerful elites. In practice, the coordination structure did not ensure proper monitoring of these issues.

5. THE ROLE OF ONGOING RECOVERY IN REDUCING PRE-AILA VULNERABILITIES

This study attempted a systematic examination of ongoing recovery initiatives in the context of pre-Aila vulnerability reduction (VR). Major recovery initiatives implemented in Koyra were identified by the institutional survey, literature review and FGDs. Thereafter, the recovery initiatives were grouped into 11 clusters as listed in Tables 1 to 4. Experts were asked to give their judgment on the potential roles of each recovery initiative in

Table 1 Potential Contribution of Recovery of Physical Safety, Water Supply and Sanitation, and Housing to Pre- Aila vulnerabilities Reduction (PAVR)

Major Cluster	Implemented Recovery Measures	PAVR
Physical Safety	Emergency countermeasure to repair breaches	2.2
	Emergency repair of 20-km embankment	2.6
	Rehabilitation of embankment (to the pre-disaster design condition)	3.6
Water and Sanitation	Re-excavation / construction of ponds	2.8
	Installation of desalination plant/ hand pump tube-wells/ rainwater harvesting system (RHS)	3.0
	WASH Promotion	3.6
Housing	Cash grant (around 250 USD) for house repair	3.6
	A new house with sanitation facilities replacing the damaged house or in a new location. (Type: GI sheet, bamboo structure, raised plinth level)	3.0
	A new house with sanitation facilities replacing the damaged house or in a new location (Type: brick structure, GI sheet roof, raised plinth level).	2.8

Note: Score 1=Least contribution, '2'=Low contribution, '3'=Moderate contribution, '4'=Fair contribution and '5'=Significant contribution to pre- Aila VR.

pre-Aila VR following a structured questionnaire. They were asked to judge by giving scores ranging from 1-5. Score 1 refers to the least contribution and Score 5 refers to a significant contribution in reducing pre-Aila vulnerabilities. The average scores (from the answers to Question 3) are shown in **Tables 1** to **4**. Discussions and critical analyses of these tables are provided in the following sub-sections as well.

5. 1 Physical Safety

Aila induced a storm surge that breached the coastal polders in Koyra in 36 places (Roy et al. 2009). Around 81 km of 119 km of embankments was completely destroyed, which resulted in long-term inundation for 2-3 years. In response, the BWDB first tried to close the embankment openings by earthen works. Since this emergency work was not successful in several places and these were only emergency measures, the experts gave low scores to this contribution to VR. The expert's judged the emergency repairs and rehabilitation of the embankment, which was just restoration to the pre-disaster design condition, as a low contribution to VR (**Table 1**). Another justification was that this emergency work and rehabilitation did not resolve the causes of embankment failure at

the time the storm surge hit. The causes of embankment failures and pre-Aila vulnerabilities were illegal breaching, unsustainable growth of shrimp farming inside the polders and a lack of a sufficient maintenance mechanism (Sadik et al. 2017). The frequent embankment breaching (even after completion of the recovery work) due to high tides supports the judgment of the experts.

5. 2 Water Supply and Sanitation

Sanitation was a critical sector that was affected severely by Cyclone Aila. Re-excavation of ponds, repair of ponds and filters and construction of new ponds were attempted to restore the water supply in areas where hand pump tube wells were not effective due to groundwater salinity. Saltwater shrimp farming is extensively practiced in Koyra and most of the pond areas are surrounded by saltwater shrimp farms. Consequently, salt water leaches into the ponds from adjacent shrimp aquaculture ponds and raises the salinity of the pond water. The experts judged excavating or re-excavating ponds as a low contributor to VR (**Table 1**). Whereas, the experts considered the installation of desalination plants, hand pump tube wells (where fresh ground water is available) and rainwater harvesting systems (RHS) to be comparatively better

options. However, the experts considered these initiatives as moderate contributors to VR due to the installation of only a few desalination plants, a limited availability of fresh groundwater (only in a few villages), and the community's low capacity for proper maintenance of RHS.

5.3 Housing

Before Cyclone Aila, most of the houses in Koyra were made of earthen walls, thatched rooves (Nypa Palm leaves) and wooden or bamboo foundations. To promote housing recovery, the government provided around 250 USD to 90% of all households in Koyra except three villages where the grant was provided to around 35% of households (Source: FGD). Besides, NGOs constructed houses (transitional shelters as per NGO's definition) for 20%-30% families. These houses were built on the beneficiaries' own land and were made of wood, corrugated iron sheets, and earthen floors. The ERF of UNDP provided brick-made houses to only 265 (0.6%) Aila-affected families (De Silva and Shafie 2014). Since, the government's cash grant reached a maximum number of families, and beneficiaries could use that grant to either repair their houses or for food security, the experts judged it a moderate to fair contributor to VR (Table 1). On the other hand, the experts judged other housing support as moderate since such support was

provided to a limited number of affected families. Moreover, the houses were constructed on land without considering any hazard-based land use plan.

5.4 Cyclone Shelters

The inadequate number of cyclone shelters, no space for livelihood shelters, and lack of gender consideration in cyclone shelters were critical sources of vulnerabilities before Cyclone Aila (Sadiq et al. 2017). This motivated experts to judge the construction of new multipurpose cyclone shelters as a significant contributor to VR (Table 2). However, during this judgment, experts did not consider how many new cyclone shelters were built. Despite constructing 18 new cyclone shelters (Source: Local Government Engineering Department, LGED), the population of 2 to 3 wards need to share one cyclone shelter.

5.5 Disaster Preparedness, Early Warning, and Disaster Awareness

During Cyclone Aila, most people received a last-minute evacuation warning and rushed to cyclone shelters, high roads and embankments with no preparedness (Sakamoto 2016). Therefore, almost all NGOs had recovery programs on disaster training to improve early warning dissemination and evacuation behavior. Since this training was

Table 2 Potential Contribution of Shelters, Preparedness, Early Warning and Disaster Awareness Related Measures to Pre- Aila Vulnerabilities Reduction (PAVR)

Major Cluster	Implemented Recovery Measures	PAVR
Cyclone Shelter	Repair of cyclone shelter	3.8
	Construction of new multipurpose shelter	5.0
Disaster Preparedness and Early Warning	Improvement of warning dissemination mechanism by training of volunteers, local DDM professionals, and raising community awareness	3.6
	Introducing mobile based (SMS/interactive voice response) services for disaster warning	3.2
	Allocation of budget/resources (to local government) in pre-disaster period for taking preparedness of emergency response.	3.4
Disaster Awareness	Community training for DRR and CCA awareness	3.6
	Mass awareness and campaign	3.2
	School based resilience awareness for children	3.6

Note: Descriptions of scores are provided in the notes of Table 1.

project-based and not regular practice, the experts judged them as a moderate to fair contributor to VR (Table 2). The government, along with international HOs, developed a new mobile-telephone-based early warning dissemination system. Unfortunately, this is not widely known in the community, which also reflected the expert's opinion. Similarly, the experts did not judge the new approach of allocating an emergency budget to the local government before any disaster very high. As per their opinion, apart from the corruption issue, this budget is still limited.

5. 6 Livelihoods

The pre-Aila income-related vulnerabilities were rooted in unsustainable agricultural practices, extensive growth of conventional shrimp farming without any land use plans and high dependency on nature. Those dependent on shrimp farming and agriculture suffered the most (Abdullah et al. 2016). One study suggests that salt-tolerant rice varieties, mixed shrimp-rice agriculture, land zoning for shrimp farming and technological agricultural improvements are viable options for that region.

Since the recovery initiatives did not include these viable options, the experts judged the implemented recovery initiatives as poor to moderate contributors to VR (Table 3). The experts found direct livelihood support such as cash grants, livelihood asset support (e.g. boats, nets, rickshaw pullers, etc.) as fair contributors to VR.

5. 7 Education

Direct damage of educational institutions, the collapse of road networks and long-term inundation led to suspension of the education system in Koyra for a long time (1-2 years as reported by locals). The government and NGOs first repaired partially damaged schools and distributed essential furniture, books, etc. As per the experts' opinion, since these initiatives did not ensure any additional risk reduction measures, the contribution to VR was judged low to moderate. The expert's judged school-based sanitation, food and nutrition programs and reconstruction of damaged schools as a moderate to fair contributor to VR (Table 3). The experts reported that the establishment of more new schools, and initiatives for reducing school

Table 3 Potential Contribution of Recovery of Livelihood, Education, and Rural Infrastructure for Pre-Aila Vulnerabilities Reduction (PAVR)

Major Cluster	Implemented Recovery Measures	PAVR
Livelihood and Local Economy	Micro-credit	1.8
	Livelihood support: cash/boat/net/rickshaw	4.0
	Distribution of agricultural input/juvenile fish	3.6
	Training on livelihood	2.8
	Cash for Work + Cash for Training (NGO initiated one-year program)	2.3
	Cash for Work (40-day / 60-day program)	2.4
	Safety net for ultra-poor	3.6
Education	School repair	2.8
	Reconstruction of new schools	3.2
	Distribution of essential furniture, recreational & educational materials	2.8
	School-based sanitation, food, and nutrition program (for students)	3.2
Rural Infrastructure	Emergency repair earthen roads (under cash for work scheme/volunteer labor)	2.8
	Re-construction of roads (conventional design: earthen & herring bond brick)	3.2
	Conversion of bund of shrimp farming pond/agricultural land to rural roads	2.2
	Rehabilitation and construction of Upazila administration infrastructure	2.4

Note: Descriptions of scores are provided in the notes of Table 1.

dropout rates could highly contribute to VR, but unfortunately these measures were not implemented in the Koyra recovery.

5. 8 Rural Infrastructure

A poor road network and poor road conditions were two major vulnerabilities before Aila hit, which resulted in prolonged suffering (Mallick, Rahman, and Vogt 2011). Aila inundated the entire area of Koyra and caused the road communication system to collapse. The buildings of administration offices were also poor quality and built in low-lying areas. Consequently, these buildings were also inundated during Aila. Under the 'Cash for Work' program the local government attempted to engage local people in emergency repair work. NGOs also helped in a similar way. The LGED attempted to reconstruct damaged rural roads with funding from several foreign aid and government projects. These reconstruction efforts did not consider any additional DRR measures or any improvements of design. No new roads were constructed to expand the road network from the pre-Aila period. Therefore, vulnerabilities related to infrastructure are similar to those of the pre-Aila vulnerabilities. On this note, the experts judged the implemented measures low to moderate contributors to VR (Table 3). Surprisingly, the experts did not recognize the rehabilitation of the Upazila local administrative buildings as a good contributor to VR. Although

these buildings were reconstructed with improved design and additional DRR measures, the experts judged that local people would not receive any direct benefit from that.

5. 9 Disaster Governance

The aftermaths of Cyclones Sidr (2007) and Aila (2009) motivated the government to make remarkable changes in its disaster policies and practice. The UNDP and other DPs advocated for improved disaster governance. A new disaster management plan has been developed. The ERF of UNDP also developed new guidelines for emergency preparedness. However, the mechanism for effective enforcement and monitoring of these policies and guidelines has not been improved remarkably, which prompted the experts to score these initiatives as a moderate to fair contributor to VR (Table 4). The experts also judged the initiative of the NGO coordination meetings at the UNO office as a low to moderate contributor in reducing vulnerability since these coordination meetings did not ensure effective coordination and harmonization among NGOs (Table 4). This is discussed in detail in Section 4 of this paper.

5. 10 Social Organizations and Networks

The international HOs and DPs promoted social organization and networking by forming local volunteer committees and building NGO-communi-

Table 4 Potential Contribution of Recovery of Disaster Governance and Social Organization for Pre-Aila Vulnerabilities Reduction (PAVR)

Major Cluster	Implemented Recovery Measures	PAVR
Disaster Governance	Establishment of early recovery facility (by UNDP) for national level coordination	3.4
	Hold NGO coordination meeting at UNO office	2.4
	Development of Guideline for emergency preparedness for NGOs	3.6
	Development of Disaster Management Plan	4.0
	Training for local disaster management professionals/ UNOs/government officials	3.0
Social Organizations and Networks	Formation of local committee and volunteer groups and capacity building by training	3.4
	Building NGO-community partnership	3.0
	Increase consultation between community and local government	3.6

Note: Descriptions of scores are provided in the notes of Table 1.

ty partnerships. The NGOs also worked to enable an environment in which consultation between the community and local government would be increased. Since these initiatives were project based only and were not continued after completion of the project, the experts judged them as a moderate to fair contributor to VR (Table 4).

Although NGO-community partnerships are important for VR (Islam and Walkerden 2015), people are becoming dependent on aid. Experts from NGOs reported that when NGOs were constructing houses, they requested the house owner to help in the construction as a paid worker. Unfortunately, there were several cases where people did not want to work. NGO's aid is also making people greedy. During the field survey, it was observed that when local people were asked whether they received any support, they promptly answered 'No'. Whereas, further discussion revealed that they had received relief, cash grants, homes, etc. Thus, an increasing dependency on NGOs' aid and a growing tendency toward not engaging in self-help are undermining the expected benefits of NGO-community partnerships.

6. CONCLUDING REMARKS

The central question of this study was whether the ongoing Aila recovery initiatives were reducing pre-disaster vulnerability. The study evolved through identifying recovery initiatives, examining coordination mechanisms and evaluating recovery initiatives by the judgment of experts who were directly involved in the Aila recovery. The findings of this study suggest the present NGO coordination mechanism does not ensure effective coordination at the Upazila level at the time of post-disaster recovery. It highlights the need for a comprehensive and effective coordination mechanism at the Upazila level. Capacity building (technical, human resources and financial) of the UNO, and establishment of an Upazila office of the Department

of Disaster Management will strengthen the aid effectiveness mechanism by ensuring their effective involvement in monitoring and coordination. In addition, the HCTT should establish a joint coordination cell at Upazila with the UNO to ensure coordination and alignment of the humanitarian assistance to local needs.

The experts' evaluation of the Aila recovery initiatives reveals that viable measures to reduce pre-Aila vulnerabilities are rarely considered. The experts' judgment on the recovery measures implemented is similar to the local people's understanding of the recovery identified in the FGDs. During the FGDs, local people were asked about possible damage and suffering if a cyclone similar to Aila occurred. They answered that the damage and suffering would be greater or at least similar to that caused by Cyclone Aila. Their judgement was based on the present weak condition of coastal polders, rural roads and insufficient numbers of cyclone shelters in their villages.

The major sources of vulnerabilities in the pre-Aila period that ultimately led to prolonged suffering of people due to Cyclone Aila were poor maintenance of embankments, unplanned saltwater shrimp farming inside the polder area, the practice of illegal breaching of embankments (Tada 2011), poor road communications, the growth of scattered settlements along the river side (Alam and Collins 2010; Mallick, Rahaman, and Vogt 2011), high dependency on shrimp farming for livelihoods (Abdullah et al. 2016), poor social network (Islam and Walkerden 2015), lack of community participation in water management (Dewan, Buisson, and Mukherji 2014; Gain, Mondal, and Rahman 2017) and a poor water supply sanitation system (Mallick, Rahaman, and Vogt 2011). Therefore, this study recommends long-term viable measures to eliminate these major sources of vulnerabilities. These viable long-term measures are rooted in land-use zoning, full recovery of coastal polders, regulation

of the growth of scattered housing along the river side, protection of villages from storm surges, creation of hazard-map-based, land-use planning for housing and rural infrastructure, improvement of the design of rural roads, establishment of appropriate technology for the water supply, etc. Inclusion of these measures in recovery would reduce pre-disaster vulnerabilities and improve the prospects of the Aila affected community in Koyra.

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要 旨

バングラデシュは2009年にサイクロンアイラに直撃された。防災担当者や研究者は、被災地における壊滅的な被害と長引く状況は、アイラ発生前つまり準備の段階の脆弱性に原因があったとしている。サイクロン襲来以降、多くの人道的組織や様々な政府省庁が次の災害対応の準備につながる復旧に携わってきた。本研究では、コイラ郡 (Sub district) を対象地域とし、アイラ復旧のメカニズムを系統的に研究することにより、今後どのような準備が必要になるか提唱する。具体的には、組織への調査を通して、専門家へのインタビュー、現地の方とのグループディスカッションを行い、アイラ発生前の脆弱性を分析し、今後の災害軽減の準備に役立つ復旧対策について考察した。その結果、現存している NGO の調整メカニズムに、現地で共同して復旧するための仕組みがないことが明らかとなった。その他の結果として、採用された復旧対策のほとんどは、今後の防災の脆弱性の軽減につながっていなかったことが明らかとなった。このことは、現地コミュニティーで、今後アイラと同等のサイクロンが発生すると同じような壊滅的な被害を受けるのではないかと脅威を感じていたことから明らかとなった。これらの災害前の脆弱性の根本的な原因を踏まえ、今後の災害に備えるための長期的に実行可能な対策を提唱する。