Cyclone Aila: One Year on

Natural Disaster to Human Sufferings

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The report on Aila titled 'Cyclone Aila: One Year on; Natural Disaster to Human Sufferings' provides an assessment of the present situation of the Aila affected areas of Bangladesh. This report is an output of Climate Change, Biodiversity and Disaster Risk Reduction Unit of Unnayan Onneshan, a multidisciplinary Policy Research Centre. The report is prepared Uthpal Kumar, by Mohammed Abdul Baten, Abdullah-Al-Masud, Khandakar Showkat Osman and M. Mizanur Rahman under the guidance of Rashed Al Mahmud Titumir.

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1. Background

Aila, category 1 cyclone, hit South-Western coastal region of Bangladesh on 25 May 2009. The cyclone took shape on 23 May and dissipated on 25 May 2009 in the coastal region of Bangladesh. The sustained wind speed of the Cyclone Aila was about 65-75 mph and thus it is defined as the category-1 cyclone (74 mph is the lowest threshold for Cat-1 hurricane). Even though Aila was a weak category cyclone by the definition, its economic cost outweighs the impacts of Super cyclone 'Sidr' and brought in long-term sufferings for the southwestern people of Bangladesh. About 2.3 million people were affected by Aila and many of them stranded in flooded villages as they had no alternative to save themselves. The Cyclone Aila furiously hit the Satkhira and Khulna Districts of Bangladesh, entrancing immediate death of about 325 people including massive infrastructure damages. The tidal surge height of about 10-13m dropped on the region washed away the huge number of households, lives, livestock, crops and all other resources of the affected region. The whole incident occurred within a very short time, and people became homeless leaving their assets in the households. During cyclonic event a small percentage of the affected people could manage to take them in the nearby cyclone shelter and maximum of them took shelter on roads and roofs of the schools, colleges, madrashas, mosques and *Union Parisahd* (local government) buildings.

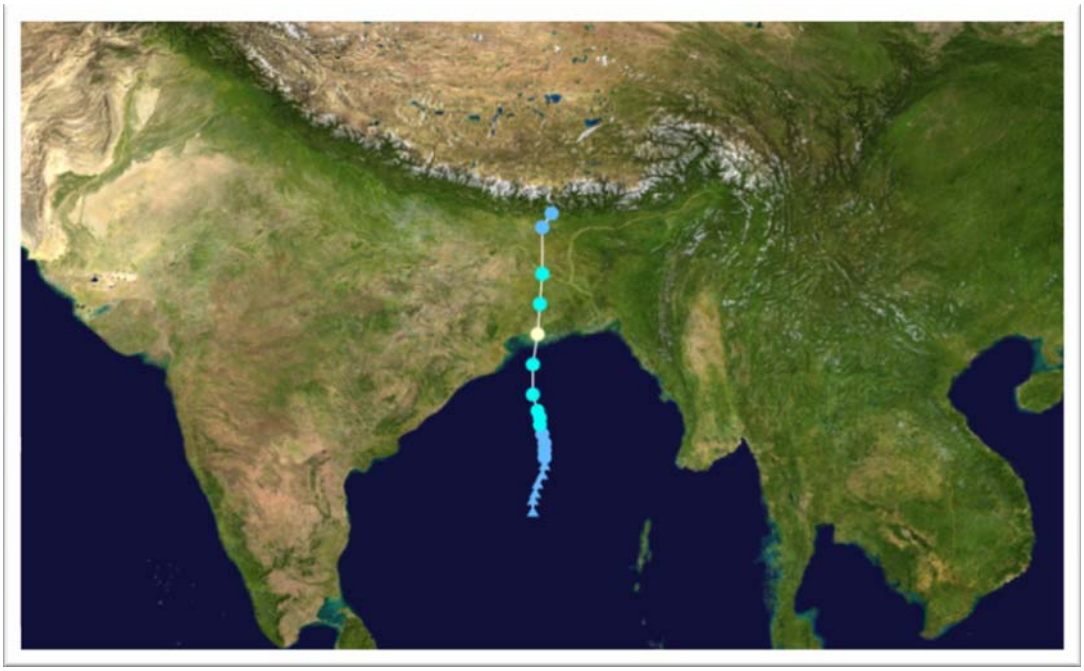

Figure 1: Cyclone Aila Path (Wikipedia, 2009)

The amount of total damage of Aila is yet to be calculated even though one year has already passed after the incident. In Bangladesh, Khulna and Shatkhira are the most affected districts.

Moreover, damage information has also been noticed from Bagerhat, Pirojpur, Barisal, Patuakhali, Bhola, Laxmipur, Noakhali, Feni, Chittagong and Cox's Bazar (Roy, *et. al,* 2009).

This report has been prepared as a follow up of the initial damage assessment Report of Unnayan Onneshan which was published during June, 2009 (Roy, *et al.* 2009). In continuation, this review report aims to provide an understanding of the present situation exposed by the cyclone Aila. This study is expected to provide an account of socio-economic and environmental scenario of the affected people and their present livelihood condition in the affected regions after one year of Aila ravage with a key focus on Shyamnagar, Koyra and Dacope Upazila of Satkhira and Khulna District. Both primary and secondary data collected through a semi-structured open ended questionnaire, personal observation, Focus Group Discussion (FGD), information from existing literature were fed into the study. A total of 1200 interviews were carried out including 300 from each area. Moreover, 3 FGDs, 1 from each site accompanied the study.

2. Study Area

The study concentrates on Koyra and Dacope upazila of Khulna district and Shymnagar of Satkhira district. Koyra is the largest upazila of Khulna district. *Koyra upazila* occupies an area of about 1775.41 sq.km, including 951.66 sq.km of forest. The *upazila* consists of 7 *unions* named as *Koyra, Amadi, Bagali, Dakshin Bedkashi, Maharajpur, Maheswaripur, and Uttar Bedkashi union*. The total population of this upazila is 192534, of which male is 95993 and female is 96541. In the upazila majority household depends on agriculture (66.64%) including 44.30% on cropping, livestock, forestry and fishery and 22.34% on wage labour. On the other hand, Dacope is the second largest upazila of Khulna district. Dacope occupies an area of 991.57 sq.km including 494.69 sq.km forests. The upazila consists of 9 unions namely *Bajua, Banishanta, Laudubi, Chalna, Dacope, Kailasgonj, Kamarkhola, Sutarkhali, and Tildanga*. The total population of Dacope is 157489. In the upazila majority household depends on the Agriculture (60.07%) with 44.98% on cropping, livestock, forestry and fishery, and 26.82% on selling labour in agricultural market.

Another study area Shyamnagar is regarded as the largest upazila of Satkhira district. The upazila occupies an area of 1968.24 sq.km including 1622.65 sq.km of forest. Total 12 unions, named as *Shyamnagar, Atulia, Bhurulia, Burigoalini, Gabura, Ishwaripur, Koikhali, Kashimari, Munshiganj, Nurnagar, Padmopukur, and Ramjannagar belong to the upazila*. Out of 313781 population of the upazila 160294 are male and 153487 are female. In the upazila, 64.98% household depends on agriculture of which 38.16% on cropping, livestock, forestry and fishery, and 26.82% on selling labour in agriculture field (BBS 2001).

3. Impacts of Aila

Koyra, Dacope and shymnagar upazila of southwest coastal belt of Bangladesh were hit the hardest by the cyclone Aila. Storm surge washed away all the houses, crops and agri-land, homestead garden and livestock and there by the area experienced huge toll damages to lives and livelihoods. Aila not only broke down the overall social harmonization but also resulted into a chaotic situation in those areas. Now around 1 million people are still fighting against the rampant effect of slow poisoning of Aila in the Khulna and Satkhira District. Figure 2 presents the statistics of affected people at Dacope (137000), Koyra (152496) and Shyamnagar (243293) upazila. People, in the affected region, are now struggling to manage minimum life sustaining requirements like adequate food, shelter, water and sanitation facilities. Women and children are experiencing most inhuman situation and they become more vulnerable as the male earning member of the family either faced death or migrated for managing family needs and livelihoods.

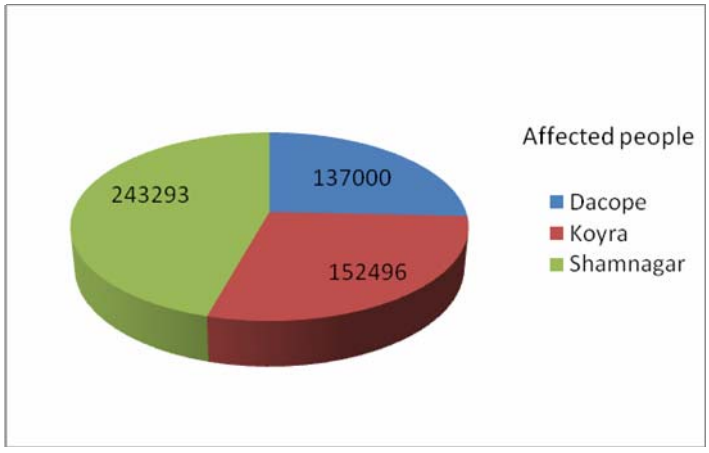

Figure 2: Aila affected people at Dacope, Koyra (Khulna) and Shyamnagar (Satkhira) upazila

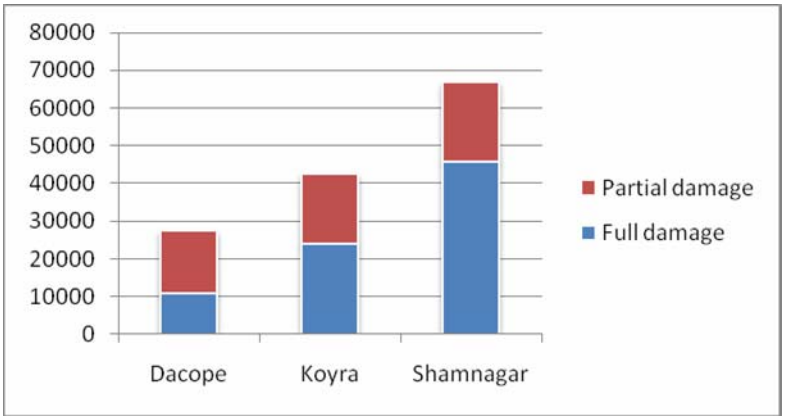

Figure 3: Households damaged at Dacope, Koyra and Shyamnagar

Widespread break out of water borne diseases such as diarrhea and skin allergy are now common and medical facilities are still in scarcity in the affected areas. Aila has damaged around 136690 households and 600km embankment in the affected areas and flooding of new area has become common phenomenon due to absent or damaged embankment. The total households damaged at Dacope, Koyra and Shyamnagar are to be found as 27400, 42440 and 66850 respectively (Figure 3). Aila has damaged about 0.2 million acres of productive cropland and aggravated the overall food insecurity situation of the area. Reportedly, almost 73 thousand people became workless in the affected areas.

3.1 Aila Impacts on Satkhira District

Among the affected districts, Satkhira receives the highest amount of impacts in its infrastructures including educational institutions, religious institutions, roads, bridges, embankments etc. The study reveals that 734 institutions were damaged fully or partially. The adverse impacts of Aila were observed in 7 Upazilas and 48 unions of Satkhira District. However, Shyamnagar and Ashasuni are the most affected Upazila as reported by the local source and available data. The study reveals that more than fifty thousand people have been adversely affected by Aila flooding. On the other hand, total damaged cropland is about 1250 ha. Moreover, 59 people died and 1509 injured during Aila. Aila's impact on infrastructure also presents devastating scenario. 734 educational institutions including the religious institutions, 329.25 km roads, 41 bridges or culverts, 292.42 km embankment and 26028 ha shrimp farm (gher) were fully or partially damaged. Besides these, more than thirty thousand people positioned themselves on the embankment at Gabura and Padmopukur, as they did not get any safe place for their immediate shelter during the disaster. Table 1 & 2 present detail damage information of Shyamnagar upazila.

Table 1: Damage information of Satkhira District

Description	**Damage information**		
Satkhira District	Affected total upazila =7		
Affected union (no.)	Very high=10, high=20, partial=48		
Affected population	569810		
Affected family	132544		
People died	59		
People injured	1509		
	Full	***Partial***	***Total***
Damaged households (no.)	106325	49195	155520
Damaged croplands (ha)	812	453	1265
Damaged education Institutes and temples (no.)	136	598	734
Roads (km)	179.75	149.5	329.5
Bridge/culvert/closure (no.)	41	-	41
Embankment (km)	35.9	256.52	292.42
Shrimp farm (ha)	26028		

Source: District damage assessment report, as of 22-07-2009

Table 2: Summary of the damaged infrastructure in Satkhira District

Upazila	Damage description							
	Edu. Ins. and temples (no.)		Road (km)		Bridge/ culvert (no.)	Embankment (km)		People took Shelter
	full	partial	full	partial		full	partial	
Shyamnagar	10	141	99.75	23.5	41	26.18	111	Cyclone shelter: Gabura=3000 (5) Padmopukur=2950 (6) Embankment: Gabura=13000 Padmopukur=15000
Ashasuni	33	7	55	36	-	3.6	75.67	
Kaliganj	2	147		64		0.32	32	
Sadar	0	90	0	16	-	0.3	13.85	
Debhata	62	114	0	0	-	0.5	14	
Kolaroya	28	40	0	0	-	0	0	
Tala	1	59	25	10	-	5	10	
Total	**136**	**598**	**179.75**	**149.5**	**41**	**35.9**	**256.52**	**Total 33950**

Source: District Commissioner Office, Satkhira

3.1.1 Infrastructure Damages at Shyamnagar Upazila

Shayamnagar is the perfect epitome of Aila ravage as it was most vehemently seized with Aila attack. Besides the accounted damage, a large number of households and small infrastructures were damaged. In Gabura and Padmapukur union, more than 34 thousand people became homeless and among them 6 thousand people are still living in the nearby cyclone shelter and the rest 28 thousand are staying in makeshift tents or under the open sky on embankments. Thus, day by day, the embankments are facing degradation. Within Satkhira district, Shyamnagar upazila is one of the badly affected areas from Aila which is evident from the *Upazila Parishad* database where it is estimated that among 59 deaths in the upazila 28 are from Babura, 10 from Padmopukur, 15 from Burigoalini, Ishwaripur and Munshiganj, and 6 from Koikhali and Kashimari union. Aila also injured 1430 people in 12 unions. Areal coverage shows that 359.55 sq. km. was fully inundated by the surge water. (Table 2)

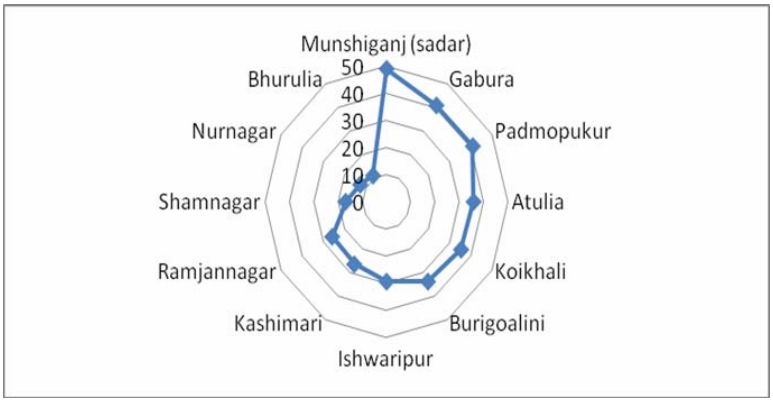

Figure 4: Areal coverage of damages of cyclone Aila in Shyamnagar Upazila

Household damage statistics estimates that about 160432 people were adversely affected, where 104227, 22865 and 33340 people were very highly affected, highly affected and partly

affected respectively (Table 3). Among the unions of the Shyamnagar upazila Munshigaj and Gabura were mostly affected. Where as, Padmopukur, Burigoalini and Atulia were other worse affected unions, even though received some less impact than Munshiganj and Gabura (Figure 4 & 5)

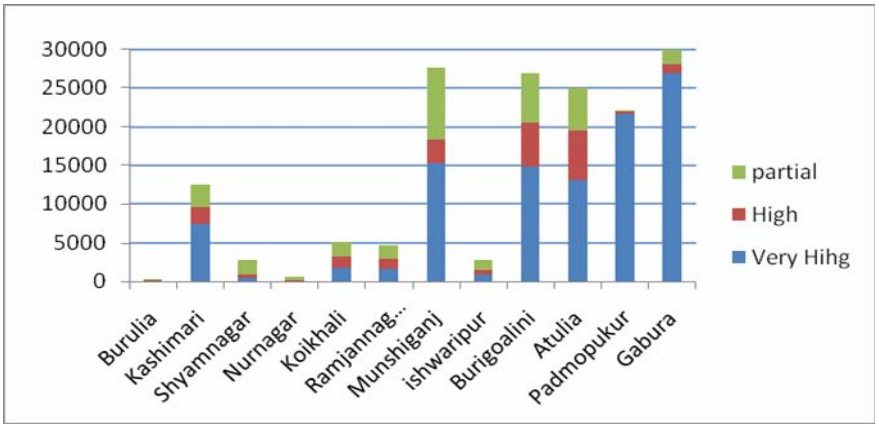

Figure 5: Affected population at different unions of *Shyamnagar Upazila*

Table 3: Summary of household's damage information of Shyamnagar Upazila

Sl. No	Affected Union	Affected area (sq.km)	Affected people			People dead	People injured	Damaged households	
			Very high	High	Partial			Full	Partial
1	Bhurulia	11.15	65	85	125	0	4	26	80
2	Kashimari	26.72	7500	2075	2925	3	17	3000	2000
3	Shyamnagar	16.88	500	350	1900	0	12	200	900
4	Nurnagar	12.6	60	100	375	0	9	24	190
5	Koikhali	35.45	1815	1410	1955	3	20	726	1346
6	Ramjannagar	25.9	1615	1385	1610	0	34	646	1198
7	Munshiganj	49.12	15245	3120	9255	5	189	6098	4950
8	Ishwaripur	29.55	960	585	1280	5	48	384	746
9	Burigoalini	34.1	14785	5775	6395	5	194	5914	4868
10	Atulia	35.9	13135	6420	5430	0	187	5254	4020
11	Padmopukur	41.07	21663	320	180	10	249	12000	200
12	Gabura	41.11	26884	1240	1910	28	467	11450	630
	Total	**359.55**	**104227**	**22865**	**33340**	**59**	**1430**	**45722**	**21128**

Source: Upazila Nirbahi Office, Shyamnagar

3.1.2 Impact of Aila on agriculture and livestock

The vast majority of the population of Shyamnagar are engaged with agriculture and fisheries and it is evident from the BBS (2001) statistics which estimates that about 64.98% households in this upazila depend on agriculture including 38.16% on cropping, livestock, forestry and fishery, and 26.82% on selling agricultural labor. But after Aila attack, all the

agricultural and associated livelihood activities were disrupted through damaging all agricultural settings in the region. Table 3 presents damage statistics in the agricultural sector at each union of the Shyamnagar Upazila. In Shyamnagar upazila total 194 ha of crop land was fully damaged by Aila which worth an estimated cost of 2.4 million BDT. Moreover, Aila incurred loss of about 550 million BDT in shrimp sector. Table 4 depicts total loss in monetary value received from different sector in different unions of Shyamnagar upazila due to Aila. And, consequently a threat to food security emerges in the area.

Table: 4: Summary of the damage information on Agriculture, Livestock and Fisheries

Sl. No.	**affected unions**	**Damage description**			
		Crops (ha)	Cattle (no.)	Poultry (No.)	Shrimp farm (ha)
1	Vurulia	18.7	0	0	0
2	Kashimari	42.7	21	1036	2456.66
3	Shamnagar	21.1	4	0	660.6
4	Nurnagar	13.3	3	25	489.57
5	Koikhali	23	11	0	2185.95
6	Ramjannagar	18.5	19	45	2859.22
7	Munshiganj	16.6	28	5716	6095.09
8	ishawripur	18.5	19	3121	788.4
9	Burigoyalini	10.2	129	2445	5504.14
10	Atulia	7.4	262	3366	1951.02
11	Padmopukur	3	57	4429	5346.08
12	Gabura	1	81	3095	4324.97
	Total	194	634	23278	32661.7
Damage in BDT (Approx.)		**2368000**	**2368000**	**3491000.25**	**552396000**

Source: Upazila Nirbahi Office, Shyamnagar

3.2 Aila Impact on Khulna District

Koyra and Dacope upazila of Khulna district are also among the most severely affected areas from outrageous Aila. The study finds that in Koyra, 6 unions (*Bagali, Maheswaripur, Maharajpur, Koyra Sadar, Uttar Bedkashi, Dakshin Bedkashi*) were the most damaged ones. On the other hand, in Dacope 7 out of 9 unions were fatally affected.

3.2.1 Aila Impact on Lives at Koyra Upazila

In Koyra, more than 150 thousand people were affected directly. Among them, more than 123 thousand were highly affected and about 28 thousand people were partially affected. *Dakshin Betkashi* and *Uttar Betkashi* were the two most affected unions in the Upazila because of their geographic position of being very close to the coast and so, the entire area was inundated within a very short time during the molest. At *Dakshin Betkashi* about 33 people died which is the highest in number at the Koyra region.

Table 5: Summary of Aila impact on lives in Koyra Upazila of Khulna

Affected unions of Koyra Upazila	Affected people			Affected family		People dead	Injured
	very high	High	partial	very high	high		
Bagali	1200	2500	9000	2429	900	0	0
Maheswaripur	20000	6000	4000	5500	1500	2	10
Maharajpur	20500	5500	4500	6500	2500		50
Koyra Sadar	25000	5070	3226	6504	1772	5	150
Uttar Bedkashi	8000	7000	8000	1521	1610	1	200
Dakshin Bedkashi	15000	8000	-	5000	800	33	-
Total 6	89700	34070	28726	27454	9082	41	410

Source: Upazila Nirbahi Office, Koyra

3.2.2 Impact on Agriculture and Livestock

Livelihood options (agriculture, livestock, fisheries etc.) were vehemently affected from Aila attack in Koyra. The highest number of cattle death was recorded at Maharajpur (500), whereas, that of poultry damage was recorded at *Uttar Bedkashi* (25000) and *Dakshin Bedkashi* (25000) unions of Koyra. Undoubtedly, most of the agricultural land was affected by Aila, where Koyra sadar (119-79 acres) and Maharajpur were the most victims due to their sheer dependence on agriculture. Damage of fishery resources portrays a devastating scenario where 1026 fish ponds and 20300 acres of shrimp farm were fully destroyed (Table 6).

Table 6: Impact on agriculture, livestock and fisheries

	Damaged Livestock		Damaged agriculture (acre)		Damaged fisheries	
	Cattle	Poultry	Full	Partial	Pond (no)	Shrimp farm (acre)
Bagali	12	500	108.68	-		100
Mohesharipur	100	2500	53.11	-	250	700
Maharajpur	500	2000	117.33	-	200	7000
Koyra sadar	50	2000	119.79	20	176	5000
Uttar betkashi	-	25000	74.10	-	200	4000
Dakshin betkashi	-	25000	29.68	-	200	3500
Total		12000	502.7	-	1026	20300

Source: Upazila Nirbahi Office, Koyra

3.2.3 Impact on Infrastructures

Aila caused a huge damage to infrastructures including households, education institutes, religious institutions, roads and embankments at Koyra. The study reveals that 140 km of roads and 125 km of embankment was fully and 90 km of roads and 61 km of embankment was partially affected. Moreover, 23820 households were damaged fully; where as 18620 households were damaged partially. (Table 7)

Table 7: Summary of the infrastructure damages of Koyra Upazila

Affected unions of Koyra upazila	Damaged edu. institutes (no.)		Temples	Damaged roads (km)		Damaged embankments (km)		Damaged households	
	full	partial	Temple	Full	Partial	Full	Partial	full	Partial
Bagali	1	5	10	25	50	21	5	3900	1900
Maheswaripur	-	10	50	25	-	5	8	440	3500
Maharajpur	-	15	35	30	55	20	10	4690	4000
Koyra Sadar	-	15	37	33	20	15	14	4710	4620
Uttar Bedkashi	4	10	20	12	-	30	10	2300	2800
Dakshin Bedkashi	4	15	40	15	-	20	14	3520	1800
Total unions 6	9	70	192	140	125	90	61	23820	18620

Source: Upazila Nirbahi Office, Koyra

3.3 Aila Impact on Dacope Upazila

Dacope is another adversely affected upazila of Khulna District. 7 unions of it were inundated within a moment. The high tidal surge caused more devastation than Sidr. More than hundred thousand people at Dacope were the victim of Aila resulting into the highest number affected in the Tindanga union. Among the affected people fifty thousand were displaced immediately and all these displaced people are now living in the nearby cyclone shelter, roads, embankment. The highest and lowest number of displaced people were recorded as 10000 (*Tildanga*) and 4000 (*Kamarkhola*). Almost all the agricultural land was submerged with highly saline water. As a consequence, 2700 acres of crop land was initially damaged and all other agricultural land became unsuitable for further crop production. (Table 8)

Table 8: Summary of the damage information in Dacope Upazila, Khulna

Affected union	Affected village	Affected people	Displaced people	Destroyed household	Crops damaged (acre)	Dead/missing livestock	Damaged tubewell	Damaged shrimp (gher)	Damaged fish pond
Tildanga	All	26000	10000	2000	500	400	22	300	100
Dacope	All	25000	9000	1500	400	300	17	200	100
Bajua	All	25000	9000	1800	450	400	20	250	100
Sutarkhali	All	21000	8000	2000	500	400	20	300	100
Baniashanta	All	15000	6000	1300	350	300	12	300	100
Pankhali	All	15000	6000	1200	300	250	15	150	50
Kamarkhola	All	10000	4000	950	200	200	10	150	50
Total 7	All	137000	52000	10750	2700	2250	116	1650	600

Source: USS, (2009). Cyclone Aila Situation Report

4. Present Socio-economic and Environmental Condition in Aila affected areas

After one year of Aila attack, the situation of the Aila affected areas is still with much adversity and gradually it is aggravating. Till now local people are struggling to get access to food, pure drinking water and shelter. Majority of the affected people are staying on the embankments in makeshift tents as their living places are still under water. Some of their agricultural land is still under water or have become barren from saline water intrusion. Sanitation and health care facilities have become scarce. A number of schools or other educational institutions still remain closed and dropout rate is alarmingly on the rise. Thus, people in the affected areas have been passing an inhuman situation without having minimum life sustaining arrangements. It is importantly noticeable that woman and children are the most vulnerable under this inhuman situation.

4.1 Livelihood

Shrimp farming is one of the major occupations in South-western coastal region of Bangladesh. Aila affected region also follows similar occupational pattern and shrimp farming alone constitutes 40% of the total occupation. Rest of the employed people a engaged with small holding agriculture (30%) and wage labour activities (30%). However, the study reveals that 96% of the livelihood bases were devastated by Aila. Most unfortunate thing is that till now most of the affected people could not be able to recover the damages. More than 80% of the respondents in all the three study areas are struggling to maintain a subsistence living. The most affected segment of the livelihood is agriculture and as almost all the productive agriculture land went under saline water and consequently those farmers became workless. Some of those are now engaged with wage labour activities offered by different GO's and NGO's to repair roads and embankments. However, these activities will be run for 40 days and after that their earning source is uncertain. Such contingency makes them frustrated and results into suicide of some of the affected people. Another problem arises from people's employment seeking behaviour. The study indicates that middle class family neither can seek relief nor can engaged themselves with day labor activities due to their social status and psychological barrier and it is contributing to increase their vulnerabilities, but most often it remains unnoticed.

4.2 Agriculture and Vegetation

In the study areas almost all the agriculture land (>90%) and homestead gardens (>70%) were flooded and 70% of the green vegetation were damaged. Most of the water sensitive fruit trees and vegetables died due to water logging. Only some Palme and *Xerophitic* species still survive. Table 9 presents the death sensitivity to water logging of some selected plant species in the affected region. All the respondents in the study area argued that it would not be possible to produce vegetables in salinity contaminated field before two years and for fruit species they have to wait for another 6 years.

Table 9: Death sensitivity of some Aila affected trees and vegetables at study sites.

Tree died	Fruit trees			Vegetables		
	Local name	**English name**	**Scientific name**	**Local name**	**English name**	**Scientific name**
within 2 days	Kathal	Jackfruit	*Artocarpus heterophyllus*	Morich	Chilli	*Capsicum frutescens*
	Pepe	Papaya	*Carica papaya*	Begun	Brinjal	*Solanum melongena*
	Kala	Banana	*Musa sapientum*	-	-	-
	Labu	Lemon	*Citrus aurantifolia*	-	-	-
within 7 days	Kamranga	Carambola	*Averihoa carambola*	Derosh	Okra	*Abelmoschus eseulentus*
	Litchu	Litchi	*Litchi chinensis*	Kochu	Aroid	*Colocasia esculenta*
	-	-	-	Halud	Turmeric	*Curcuma longa*
	-	-	-	Ada	Zinger	*Zingiber officinale*
within 15 days	Supari	Areca nut	*Areca catechu*	-	-	-
	Tetul	Tamarind	*Tamrindus indica*	-	-	-
Still alive	Narikel	Coconut	*Cocos nucifera*	-	-	-
	Boroi	Indian Jujube	*Zizyphus mauritiana*	-	-	-
	Aam	Mango	*Mangifera indica*	-	-	-

Source: DRCSC, 2009

4.3 Livestock and Poultry

Livestock and poultry are also important economic resources for the Aila affected area. In Shyamnagar 85% respondents said that Aila damaged their 80% livestock resources. However, this percentage was higher at *Gabura* (93%) and *Padmopukur* (95%) unions of the same upazila in respect of the average damage. On the other hand, in Koyra and Dacope, Aila damaged 75% livestock and poultry resources which significantly have reduced their farm income. The livestock and poultry death is continuing even after Aila due to food and drinking water shortage. The study reports that about 30% of total livestock and poultry death occurred after Aila mainly due to food shortage and consumption of saline water. Now most of the houses are devoid of livestock and poultry resources in the affected area and many farmers are selling their remaining livestock as they cannot provide them with adequate food and drinking water. Most farmers (68%) think that it would be better to sell rather than letting them to face brutal death without having food and drinking water.

4.4 Household Relocation

Even after one year of Aila dissipation, only 30% families have been able to repair or reconstruct their houses. However, the relocated houses are mostly temporary and made of plastic sheets and bamboo which is demonstrating their financial and structural inability to reconstruct durable brick built or wooden houses. These houses are at risk of further structural damage even with an 80 km speed wind. Majority of the Aila affected people in the study areas were forced to relocate their houses in embankments or raised land due to abolition of their houses by tidal surge and subsequent water logging. Regrettably, even after one year of Aila, 70% families are still living on the embankment in makeshift tents at different sites of the Shyamnagar (*Gabura and Padmopukur*), Koyra (*Uttar Bedkashi* and *Dakshin Bedkashi*) and Dacope (*Sutarkhali, Kamarkhola*) upazila. Results indicate that the

95% (highest) Aila affected family were forced to relocate their households at *Dakshin Bedkashi* union and 80% at *Padmopukur* unions. Besides, 89%, 84%, 87% and 83% family relocated their households at *Gabura*, *Sutarkhali*, *Uttar Bedkashi* and *Kamarkhola* union, respectively (Figure 6).

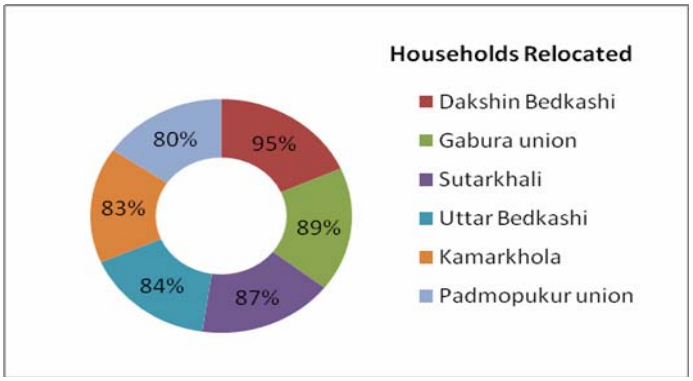

Figure 6: Household relocated at Aila affected region of Khulna and Satkhira

4.5 Drinking Water Supply and Sanitation

The people of the study area received the highest amount of sufferings from drinking water shortage and destruction of sanitation facilities soon after Aila attack. However, still the affected people are suffering from shortage of pure drinking water, which is evident from all respondents' response and physical visit to the area. In the study area water supply and sanitation coverage was about 50-60% before Aila. However, Aila devastated all the drinking water sources (ponds and tube wells). During Aila, high tidal surges contaminated all fresh water sources with polluted saline water. Many people are compelled to drink such polluted water as they do not have any other option and consequently suffer from water borne diseases such as allergy, skin diseases, cholera and diarrhea. Currently, for curative measures affected peoples' medical cost has increased by 55%. Supply of drinking water has now

Local day labors are filling water containers from the pond situated at the *Upazila Parishad* at Dacope

Woman filling water jar and Male transport the water jar to their customer's house at Dacope of Khulna

Figure 7: Present drinking water collecting process

become the most striking challenge for the study area.

Women and girls, who are generally responsible for household water collection, now have to travel long distance to fetch pure drinking water. Our study reveals that now women and girls in the affected area have to spend additional 2.5 hours every day to collect drinking water from nearby localities. Since most of the area is still water logged, they have to use boat or sometimes walk in the polluted salt water to collect drinking water. Many of the school going girls are now engaged with household water collection instead of going to school. The dropout rate, therefore, has increased sharply in the study area after Aila. Even though, some NGOs are distributing drinking water in the affected areas, however these attempts are pretty insufficient compared to demands. Moreover, disrupted communication system results into irregular supply.

4.6 Food and Nutrition Intake

Food and nutrition intake is a major indicator of human poverty measurement. During this study people were asked about their usual food habit before and after Aila. It is found that almost all the people in the affected area are now taking food irregularly. All the respondents in the study areas used to take food 3 times a day before Aila. However, Aila reversed the situation and now many people have to content with 1 time food intake or hardly 2 times in a day. Reportedly, 4 people including 1 child died in Koyra due to starvation or taking poisonous food. In Shyamnagar, Koyra and Dacope area respectively 93%, 96% and 98% respondents said that after Aila they are still with insufficient food and so, suffering from malnutrition. About 75% respondents identified reduced family income as the major cause of their insufficient food taking. On the other hand, 25% respondents blamed increase of the food prices as the primary cause. However, all the respondents agreed that salinity ingress in their crop fields is impeding crop and vegetable production and it is lessening their daily food intake share. To cope with this prolonged lean period, 27% of the poor households are now to take juicy rice to fulfill all family members' demand by small amount of rice. Even they use boiled rice-water as food which earlier they used to feed their livestock.

4.7 Law and Order Situation

In Shyamnagar, all respondents reported that law and order situation is relatively better than other part of the Aila affected regions. In Koyra, about 85% respondents said that law and order situation is well at their locality. However, 15% reported that robbery activities have increased in Sundarbans region. These respondents claimed that fishermen and forest dependent people are facing problem from robbery demand in Sundarbans. On the other hand, conflict between the agriculture and shrimp owners has been reported in Dacope. The shrimp farmers and firm owners are now very much aggressive to start the shrimp farming activities at their fields. However, local farmers are against the shrimp farming activity by arguing that salinity intrusion in agri-fields as a consequence of widespread shrimp farming is hampering their production. Local people claimed that the administration and local elites are favoring shrimp farming. As a result local farmers have been suffering from reduced agricultural production and sometimes receive administration harassment in case of their

positioning against the shrimp owners. About 50% respondents wished to go for social movement against shrimp farming activities at their sites and protest the activities at any cost.

4.8 Migration

Aila resulted into significant migration from the affected areas of Satkhira and Khulna district. The study reveals that 20%, 18% and 15% families have already been migrated from Koyra, Dacope and Shyamnagar respectively. Most of them have migrated to Khulna, Satkhira, Bagerhat, Pirojpur, Borishal, Potuakhali, Gopalganj, Faridpur, Jessore and Narail. About 55% respondents estimated that a large number of families (about 10%) are now living in the nearby city areas; but they temporarily return for getting relief, when it is distributed. Our study reveals that from Koyra about 1200 families have permanently migrated, whereas from Dacope and Shyamnagar these numbers are about 800 and 1300 respectively. Most of people have migrated to Khulna, Satkhira, Rangamati, Dumuria, Doulatpur, Jessore and Kesobpur areas for looking jobs. Some people have also migrated to West Bengal of India in search of jobs. Where as, about 3000, 1500 and 1300 families have migrated temporarily from Shyamnagar, Koyra and Dacope. The trend is continuing and every day 3 families are migrating to other areas.

4.9 Relief Management and Recovery Activities

Now GOs and NGOs have been working to recover structural damages in the Aila affected zones. However, most of the embankments are still damaged and in some parts they are fully disappeared, where it is hardly possible to distinguish the locality from the water body. In every high tide water enters into locality through breaches and there is a risk of further inundation of the whole area in case of 5 m high tide. At the initial stage organizations were much more concerned with the emergency needs and responses. A number of GOs and NGOs provided food and non-food (cloths, wallet etc.) items to the affected families. Medical care, temporary shelter materials and wash kits were distributed by a numbers of local and international NGOs among the affected households. Local government officials at *Padmopukur* informed that they have already distributed 10.5 million BDT for rehabilitation works including 4000 VGF cards. Each VGF card holder receives 20 kg rice per month.

CASE STUDY-1

Jahid Hossain (19), Village: Madinabad, Koyra Union

Mr. Hossain is a day-labour at Madinabad village. He used to manage livelihood for his four person family by pulling van before Aila. He lost his shelter and income by Aila attack. Aila did not leave anything for his survival. He is earning a tiny amount under Food For Work programme, which is insufficient to manage food for his family even only for 2 times in a day. He also got a VGF card from the union parishad by which he receives 17kg of rice instead 20kg per month. However, he had to spend 2000 taka as bribe to the union parishad official to manage the VGF card. He took loan from BRAC for repairing his houses and now incapable of repaying the loan.

But when we asked to the people, they alleged that government support is insufficient. In Shyamnagar 83% respondents claimed that local government bodies are distributing the relief materials among their relatives and own political viewers. On the other hand 30% respondents claimed that micro-credit providing NGOs are only distributing loan and relief to their cooperative members. NGOs' contribution to relief works covers about 25% families (Chairman-*Dakshin Bedkashi* Union) at Koyra. The situation is similar in Shyamnagar and Dacope. The vast majority of the affected people are still out of any formal and informal relief programme. Third party interference is another problem of relief management, which deprives the real victim of getting fare share. In Koyra, the statement of about 37% respondents bears the same testimony. Besides, 63% feel that unfair selection and business with relief cards are major problems of relief distribution at their location. Even though many national and International NGOs are active in the area, however lack of co-ordination among themselves and between government and NGO driven programmes has been identified as major problem in recovery work, as claimed by 67% of the respondents in the study area. These mismatches result into getting more relief and assistance to the less or non-affected people than worse affected people. Our study reveals that worse affected people of *Padmopukur* and *Gabura* are not getting any micro-credit opportunity from NGOs. However, some shorts of credit facilities have been found at the less affected areas of Shyamnagar, Dacope and Koyra. Local people claimed that NGOs are not interested to provide them with micro-credit as they do not have any permanent earning source so that they could recover the loan timely.

5. Recommendations

Even after one year of Aila attack, people of the affected areas are still suffering from insufficient food, water, shelter and sanitation facilities. It is, therefore, of utmost importance to ensure at least subsistence living requirements to the affected people.

The study identifies drinking water scarcity as the major problem of the affected area. Therefore, a sufficient number of tube-well should be erected through a soft loan scheme or non refundable donation. NGOs can help the local communities to pump-out saline water from the affected pond. Alternatively, Pond Sand Filter (PSF) could be introduced to the affected area.

As most of the agricultural land is still submerged under water, floating agriculture system with short rotation crop species should be introduced without any delay. Moreover, saline and water resistant seed should be provided to the farmers with free of cost to cultivate saline contaminated land.

Since the entire livelihood option in the affected area was destroyed by Aila and the affected people became workless, employment generating activities such as food for work, small scale

entrepreneurship should be run with equitable and fair representation of all affected people. Moreover, alternative livelihood opportunities should be created by using locally available natural resources. In long term, small scale job opportunities may be introduced from the local investors, government and NGOs. Training on craft, tailoring, poultry and fish feed firming, ice factory, umbrellas' bat factory, match factory, cold storage and other small and medium scale industries may be introduced to alleviate the poverty and reduce vulnerability of the local people.

Damaged embankments and communication system should be repaired, and where necessary reconstructed, as priority basis to protect the affected area from further flooding and tidal surges. Height of the embankments should be increased together with proper afforestation with suitable tree species at both sides of the embankments.

The relief programme should be run through ensuring equity and in a well coordinated way until the affected people can recover their damage. Government's VGF programme should focus the affected area as priority area. Moreover, monitoring of the relief distribution activities should be enhanced through the public participation and resources mobilization.

Since most of the people have became homeless and are still living in temporary makeshift tents in embankments and other areas, NGOs and different financial institutions can provide local people with long term low interest or no interest loan to reconstruct their houses.

Collaboration among organizations (GOs and NGOs) and the local community should be ensured to reduce vulnerabilities of the local people.

Disaster preparedness programme should focus awareness and capacity building of the local people to increase their adaptive capacity in facing different natural calamities.

At present, number of cyclone shelter is not enough to protect maximum number of people at the study sites. Therefore, sufficient number of cyclone shelters should be constructed at the sites before any other cyclone attack.

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