

Condition of Agricultural Productivity of Gosaba C.D. Block, South 24 Parganas, West Bengal, India after Severe Cyclone Aila

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Abstract- On 25th May 2009 morning severe cyclone Aila hit the Bay of Bengal coast of The Indian Sundarban region with its tidal surges of up to 6.5 metres, affecting 11 coastal districts. This surge of water damaged and washed away over 1,743kms of embankments, removing the only protection available to many people along the coast. This tidal surge causes floods over the entire region which brought high salinity and pH. This flood increased salinity and pH condition of agricultural land and highly affect over crop production. Crop production has markedly reduced after this severe cyclone. Economic conditions of the people in this region also highly affected by this natural disaster.

Hodges, marks the northern limit of the Sundarbans, running in a slightly zigzag pattern from Basirhat in the north-east to Kulpi along the Hugli in the west. Politically the Sundarbans in North-24 Parganas falls within the six Blocks of Minakhan, Haroa, Sandeshkhali-I and II, Hasnabad and Hingalganj while in South 24 Parganas it extends over thirteen Blocks of Gosaba, Basanti, Canning-I, Canning-II, Joynagar-I, Joynagar-II, Kultuli, Patharpratima, Namkhana, Sagar, Kakdwip and Mathurapur-II. The entire Indian Sundarban covers an area of 9630 sq. km bounded between estuary of river Hugli in the East, Bay of Bengal in the South, Ichhamati-Raimangal in the East and imaginary Dumpier and Hodges line in the North.

Index Terms- Cyclone Aila, Vulnerability, Crop Production.

I. INTRODUCTION OF THE INDIAN SUNDARBAN

The estuarine system of the Ganga- Brahmaputra deltaic region forms the largest mangrove eco-system in the world shared between India and Bangladesh approximately in the proportion of 60:40. It has been declared as a World Heritage Site by UNESCO. The extension of the region is between 21° 30' N to 22° 30' N and 88° 10' E to 89° 10' E covering about 104 islands of which 54 have been completely deforested. The 'Dampier-Hodges Line' named after the two Surveyor-General of India, Mr. William Dampier and surveyor Lt. Alexander

II. LOCATION OF THE STUDY AREA

The Gosaba Block (22°9'47" N, 88°48'10" E) consists of 51 mouzas with an average area of 5.6 ha. According to the District Statistical Handbook, Government of West Bengal, 2000-01, the decadal population growth rate is 11.2% (1991-2001) with a population density of 799 persons/ sq.km. There were total 222822 people in the Gosaba Block living in 44478 households with 5254 persons in Gosaba village alone. Of the 16896 cultivator population 2.44% are bargadars, 7.1% small farmers, 20.96% pattaholders and 40.53% marginal farmers.

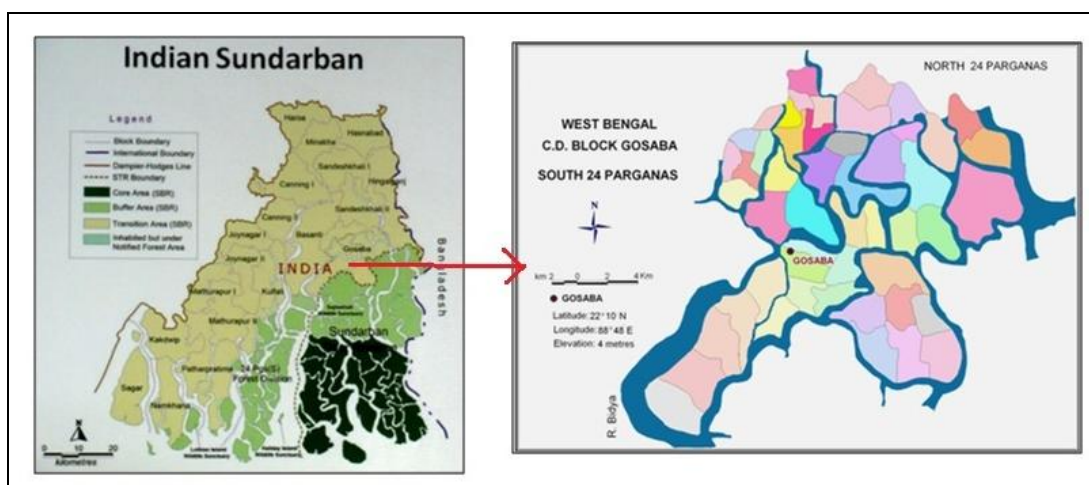


Fig: 1 Location of the Study Area

III. OBJECTIVES

The main objective is to analyse the impact of severe cyclone Aila on the crop production system of Gosaba island.

IV. SEVERE CYCLONE AILA AND IT'S IMPACT

Cyclone Aila was the second tropical cyclone to form within the Bay of Bengal 2009. The cyclonic disturbance that was to become Cyclone Aila formed on 21 May 2009. Over the following days the disturbance slowly intensified into a cyclonic storm, named Aila, and located approximately 350 kms offshore. Cyclone Aila became a severe cyclonic storm on 25 May morning. The system maintained a cyclonic intensity for approximately 15 hours after making landfall. Hitting during high tide, the cyclone brought with it tidal surges of up to 6.5 metres, affecting 11 coastal districts. This surge of water damaged and washed away over 1,743kms of embankments, removing the only protection available to many people along the coast. In many areas the damage to the network of embankments has resulted in a prolonged continuation of what affected communities faced in the immediate aftermath of the cyclone – flooding. Breaches in the embankments, which become severe during daily high tides, and particularly during periods of full moon, have prevented the high levels of self-recovery normally seen in Bangladesh following disaster events. The severe tropical cyclone Aila, the landfall of which coincided with spring high tide at Indian Sundarban on 25 May 2009, caused most widespread inundation of the region in recent times. With this tidal surge huge amount of salty water came into the agricultural land and stagnant for a long time. Due to this flood salinity of the soil increased highly which affect agricultural production. Agricultural system totally damaged due to high salinity of the agricultural field. Before this disaster where production of rice was 640 – 800 kg per bigha reduced to 320-400 kg per bigha.

Economy of this region is totally hampered due to this severe cyclone Aila. Salinization resulting from water logging destroyed agricultural fields and fresh water quality. On the agricultural fields thin veneer of salt was observed and the water bodies were heavily contaminated. So Aila has altered the livelihood of the peoples of Sundarban and Satjelia is not an exception. A questionnaire has been prepared and the villagers were asked to rate the listed problems they have faced after Aila. The study shows that according to them salinization, agricultural losses, loss of property, degradation of water quality are the major concerns.

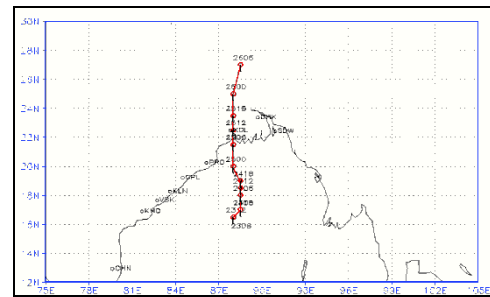


Fig: 2 Track of Cyclone Aila

Table1: Salinity of water bodies in and around Gosaba. (Source: Oceanography Department, Jadavpur University)

Waterbody	Salinity (before Aila)	Salinity (after Aila)
River	15 ppt	15.8 ppt
Pond	2-3 ppt	30 ppt
Creek	15 ppt	30 ppt
STW	20 ppt	28 ppt

Table: 2 Damages caused by severe cyclonic storm Aila

Damages Caused by the Aila	
• Number of villages affected:	4249
• Size of affected population:	25, 62,442
• Number of people missing:	8000
• Number of deaths:	Official- 70; Unofficial-300
• Length of embankment breached:	400 kilometres
• Number of cattle lost	2,12,851,12,851
• Total area of agricultural land affected:	1,25,872 ha
• Estimated financial loss in agriculture:	Rs.337crore.
• Number of houses fully damaged:	1,94,390
• Number of houses partially damaged:	1,94,701
• Total loss:	Rs.1495.63 crore.
Source: Unpublished records of the Govt. of West Bengal. Rudra. K., 2010, A South Asian Journal on Forced Migration, MCRG, Kolkata. Pp.86-93	

V. CYCLONE AILA AND ITS IMPACT ON AGRICULTURAL SYSTEM

Agricultural production system is totally hampered after Aila due to high salinity and pH condition of soil. Paddy, Wheat, Sugarcane, Chilli and Pulses production is highly destroyed. Mainly two type of paddy were cultivated in this region. One is Aman paddy which cultivated in Monsoon season and another is

Boro paddy which is cultivated in winter season. Before Aila Average production of Boro Paddy was 34671 kg/ hectare in 2008-09, which reduced to 20833 kg/hectare in 2012-13 and Aman paddy production reduced from 28004kg/ hectare in 2008-09 to 14525kg/hectare in 2012-13. Maximum reduction of Boro paddy production found in Rangabelia mouza where maximum reduction of Aman paddy production observed in Hentalbari mouza.

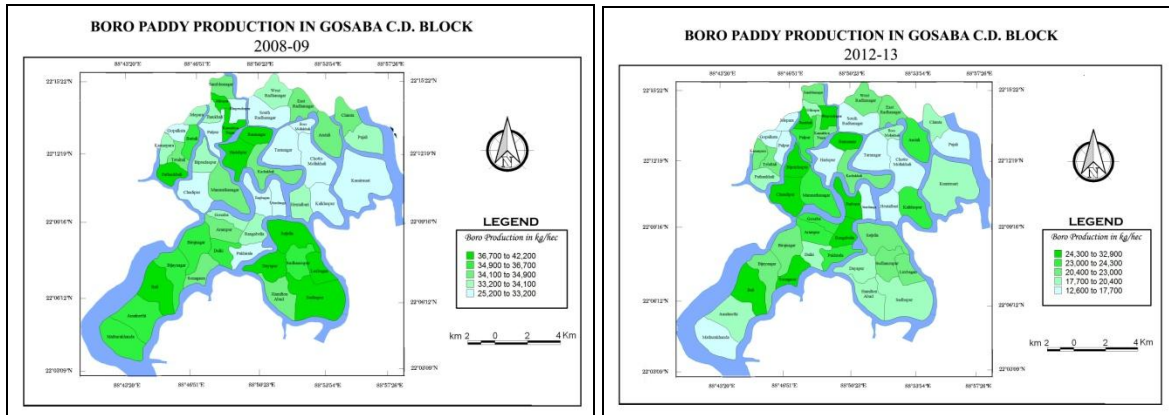


Fig: 3 Boro Paddy productions of 2008-09 and 2011-12, Data Source: ADO, Gosaba

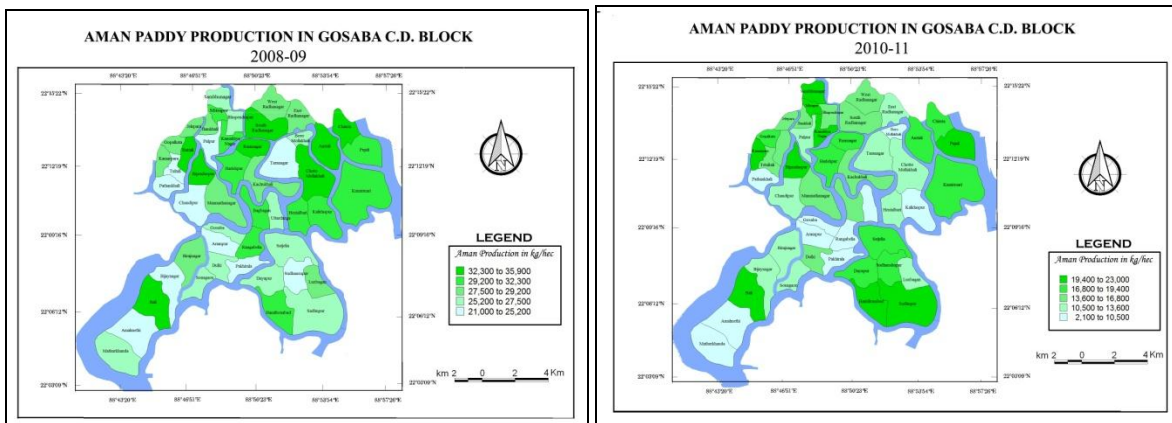


Fig: 4 Aman Paddy Productions of 2008-09 and 2011-12; Data Source: ADO, Gosaba

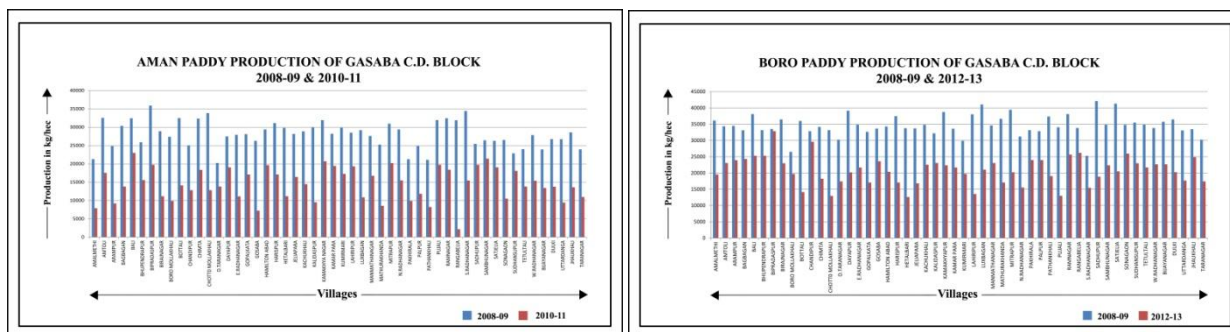


Fig: 5 Aman and Boro paddy production, 2008-09 and 2012-13; Data Source: ADO, Gosaba

VI. CONCLUSION

Aila has massively damaged the agricultural system of Gosaba Island. Due to lack of proper drainage system the surge water could not be flow back into the river and hence leaving a

thick layer of salt on the top soil over agricultural plots and fertility was markedly reduced. To increase the fertility of the agricultural land soil must be frequently ploughed and use of fertiliser with organic matter for root development is necessary. Soil management is very much needed for both plant growth and

mineralisation of organic matter and irrigation system should be developed for betterment of production.

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