



RESEARCH ARTICLE

AN ASSESSMENT OF FLOOD WITH REFERENCE TO DELTAIC PLAIN: A CASE STUDY OF KANDI DEVELOPMENT BLOCK, MURSHIDABAD, (W.B)

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ABSTRACT

The Kandi Development Block is situated in a flood prone region of moribund delta of West Bengal. Flood is a common environmental disaster in Kandi like any other deltaic region of the world. The block is well drained by a number of river systems such as mayurakshi, Kana, Kuye, Dwarka Brmhani, Gambhira etc. Kandi development block is westerly located in Murshidabad district. Apart from heavy and prolonged rainfalls river over flows, there are some casual factors of flooding. As a result the recent flood effect on a large number of people makes huge seasonal neo-refugees in every year. Create some flood shelter for sheltering flood affected people. The aim of the present work is to study causes of flood and determine preventive measures. Data and information are collected from Kandi B.D.O, Irrigation office of Kandi Sub-division, Kandi Panchayat Samiti office, satellite imagery, publication report and articles. The result shows that drainage density will high, all over the block are covered by flood; many people are displaced and sheltered in different temporary flood shelters. Most of the river side protection work is based on engineering not condition the social dimension as well as some holistic planning are urgently needed to tackle this problem.

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INTRODUCTION

Flood Continuous to strike unabated and without notice and it increases in magnitude complexity, frequency and in terms of economic impact. Disasters pose a threat to people structure and also affect Socio-economic condition of the society. To combat the situation arising out of any disaster such as flood, cyclone, earth quake, drought etc, natural or man made, a comprehensive preparedness with plan is essential with the main object of reducing loss of life, property damage and social and economic disruption. Flooding arises from structural failures, heavy rain falls, and a host of human-induced factors. Floods depend on rainfall amounts and rates, topography, land use, soil type, and antecedent moisture conditions (Funk 2006). During the twentieth century, floods killed at least eight million people (EM-DAT, 2004). Floods are often cited as being the most lethal of all natural disasters (Alexander, 1993; French and Holt, 1989), although numerous critiques of such statements are made (EM-DAT, 2004; Jonkman, 2005).

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It is true that we can neither predict nor hardly prevent any natural calamity but way of our pro-activeness by means of a perspective plan.

Overview of the study area

Kandi block is one of the 26(twenty six) Blocks of Murshidabad district having an area of 238.54 Sq.km. The Block is comprised of Ten Geam Panchayats with a total population of 2,20,631 as per 2011 Census. The Gram Panchayats are Jashore Aukha-I, Jashore Anukha-II, Andulia, Purandarpur, Hizole, Gokarna-I, Gokarna-II, Mahalandi-I, Mahalandi-II and Kumarsanda. It is known as the severally flood prone block in the district. Hizole, Purandarpur, Andulia and Kumarsanda Gram Panchayat are fully flood prone whereas the rest Gram Panchayats are partly affected during any flood. Two main rivers are passing through this Block. One is Dwaraka and another is Mayurakshi. Besides, Kana Mayurakshi is also flowing through this block and meeting with Dwaraka near Ranagram Bridge at Kandi. As a whole the lower part of Kandi Block i.e. entirely Hizole Gram Panchayat and part of Anduli Gram Panchayat convert areas of the Block.

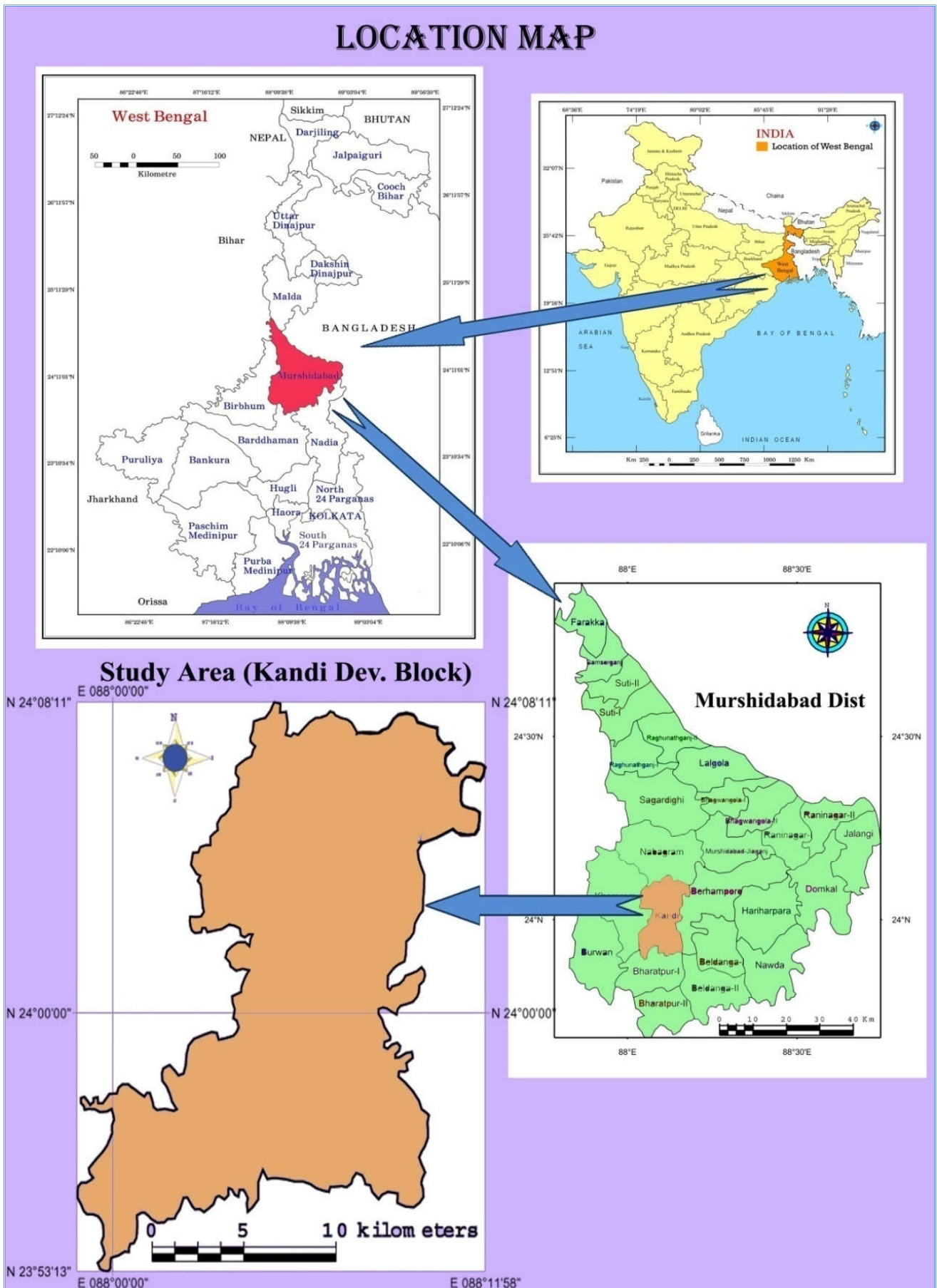


Fig 1: Figure shows the location of Kandi Development Block

Objectives of the Study

The following objectives of the study are given below:

- To analysis the drainage pattern of study area.
- To analysis the flood affected zone.
- To analysis status of flood affected people and shelter.
- Planning to make suggestion for remedial measures to tackle the problem

MATERIALS AND METHODS

Data and information are both collected from primary and secondary sources. Map of the river systems in Kandi Development block is prepared in GIS using LANDSAT data. The data, supported documents, maps current information of the study area are collected from Block Development Office, Kandi & Kandi Panchayat Samiti, old records, published reports and articles. Different locations of Block Flood Shelter are identified by GPS survey. Given data are organized in a master table and it's represent relevant cartographic techniques and thematic map.



Plate 1: Kandi Panchayat samiti

RESULTS AND DISCUSSION

Drainage in Kandi Block

From the given map (Fig.2) shows many rivers segment are covered in kandi block. So drainage density will be high. Mayurakshi, Kana, Kuye, Dwarka ,Brmhani ,Gambhira etc. rivers flow huge amount of water in Rainy season. Following discussion is given in the billow:



Plate 2. Office of the Block Land and Land Reforms Office, Kandi, MSD

Mayurakshi – Kana Mor – Kuye Basin

We will be our analysis first from upstream side of Mayuraskhi ie, from Massanjore Dam, the source of main discharge to river Mayurakshi. Whenever a barrage is constructed no doubt the up stream . And most unfortunately the district of murshidabad happens to be in downstream suffering from its ill effects. The Massanjore Dam and four Barrages on river Mayurakshi, Kopai, Dwarkaand Brahmani has-been constructed to supply irrigation water and to produce hydroelectricity. The entire district of Birbhum, a portion of Bankura and Burdwan has been made to absorb flood in the reservoir with proper postulation. Only when the reservoir is empty it can store moderate flood to some extent.

Dwarka – Brmhani – Gambhira River Basin

The design discharge from Dwarka – brohmani river system is 1472 cumec (52,000 cucec) and Dwarka – Brohmani – Gambhira river system is 1755 cumec (62,000 cusec). The formation level of proposed embankment along right bank river Dwarka have been estimated correspondent to a 100 year flood frequency through river Mayurakshi and 25 year flood frequency through river Dwarka. River Dwarka passes through predominantly agricultural area hence a 1.0 m free board is taken.

Causes of flood

The Mayurakhi system of river is rain fed. After construction of Massanjore dam, the main river Mayurakhi has no flow after monsoon. This flood situation has been aggravated by wide spread deforestation resulting prominent soil erosion, particularly in the upper catchments area of the river system, the soil of this area is such that silt load is carried from steeper reaches of the system and runs freely, which from leaves by over spilling its banks.



Plate 3. Kandi Irrigation Sub-Division Office, Kandi

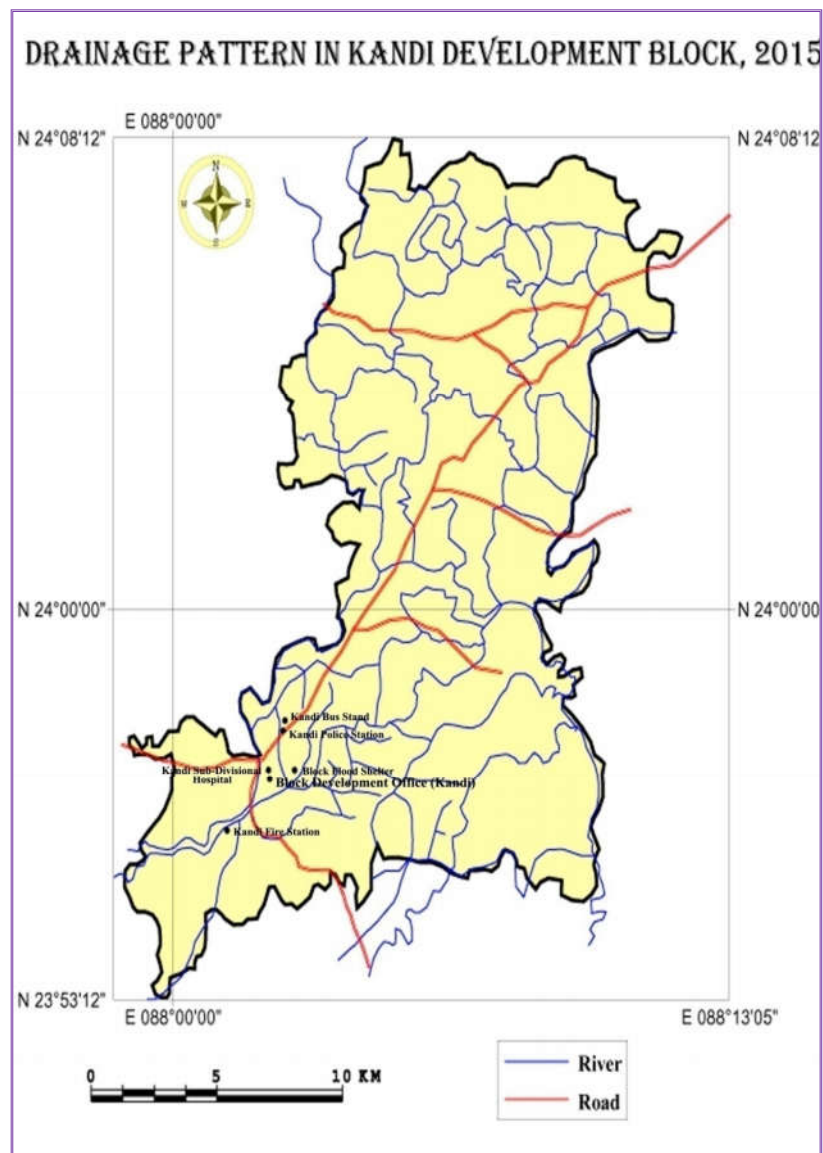


Fig. 2: River systems in Kandi Dev. Block based on LANDSAT Image 2014

Table 1. Flood Affected area of Different Gram Panchayat under Kandi Dev. Block (2015)

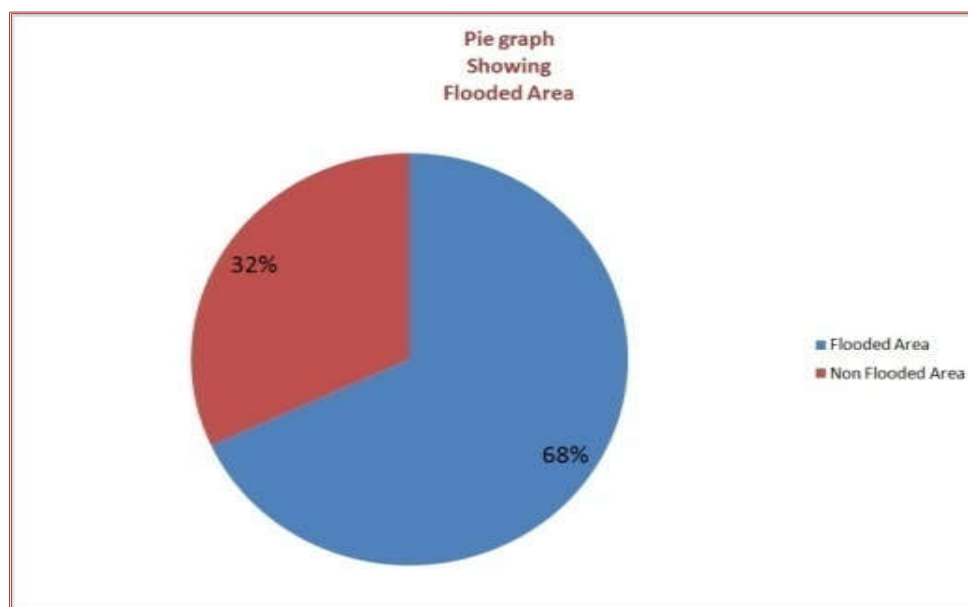
Sl.No.	Place	Latitude	Longitude	Total Area (sq/km)	Flooded Area (sq/km)	Flooded Area (%)
1	Jasohary Anukha-I	23°56'30.79"N	88°01'06.98"E	15.59	6.31	43.2488
2	Jasohary Anukha-II	23°56'57.22" N	88°01'50.21" E	17.07	12.03	66.55607
3	Andulia	23°58'12.81" N	88°03'58.61" E	42.91	30.46	73.81609
4	Purandarpur	23°59'50.77" N	88°04'27.97" E	21.22	16.93	78.78338
5	Hizole	23°59'09.51" N	88°06'23.45" E	48.89	37.52	83.58209
6	Gokarna-I	24°02'20.44" N	88°06'54.39" E	26.48	9.75	44.37311
7	Gokarna-II	24°03'43.04" N	88°08'48.73" E	32.07	12.99	43.1992
8	Kumarsanda	24°03'37.10" N	88°05'29.52" E	21.29	13.11	61.57821
9	Mahalandi-I	24°04'24.07" N	88°07'30.01" E	22.92	6.04	26.35253
10	Mahalandi-II	24°05'07.86" N	88°10'04.75" E	29.67	13.37	57.33276

Source: Kandi Block Office,2015

Table 2. Flood Affected people and Flood shelter in Different Panchayat in Kandi, 2015

Sl.No	Name of The Gram Panchayat	Number of Flood Shelter	Flood Affected People
1	Jasohary Anukha-I	16	2460
2	Jasohary Anukha-II	8	600
3	Andulia	13	2450
4	Purandarpur	18	4050
5	Hizole	15	4450
6	Gokarna-I	5	1625
7	Gokarna-II	3	775
8	Kumarsanda	16	4400
9	Mahalandi-I	9	2050
10	Mahalandi-II	13	2550

Source: Report on BDMC, 2015

**Fig. 3: Area under Flood in Kandi Block**

This being a natural process there at and this process have also been hindered by construction of embankments in many places along river banks and also circuit embankments in low areas. This has resulted in deposition of silt on river bed itself when the slop is flat and has resulted in further detritions to the drainage arteries of the area.

The factors influencing flood in this region can be summarised as under:-

- High precipitation
- Failure of embankment due to high discharge of the river system.

- Congestion of drainage arteries by situation.
- Poor outfall capacity of the river system resulting in drainage congestion.
- Reduction of spill area by occupying spill zone.
- Insufficient capacity of the Bhagirathi River.
- Ruling high flood level of the Bhagirathi River at the outfall of the Babla and the Uttarasan.
- Incapacitate storage of water due to situation within reservoir area.

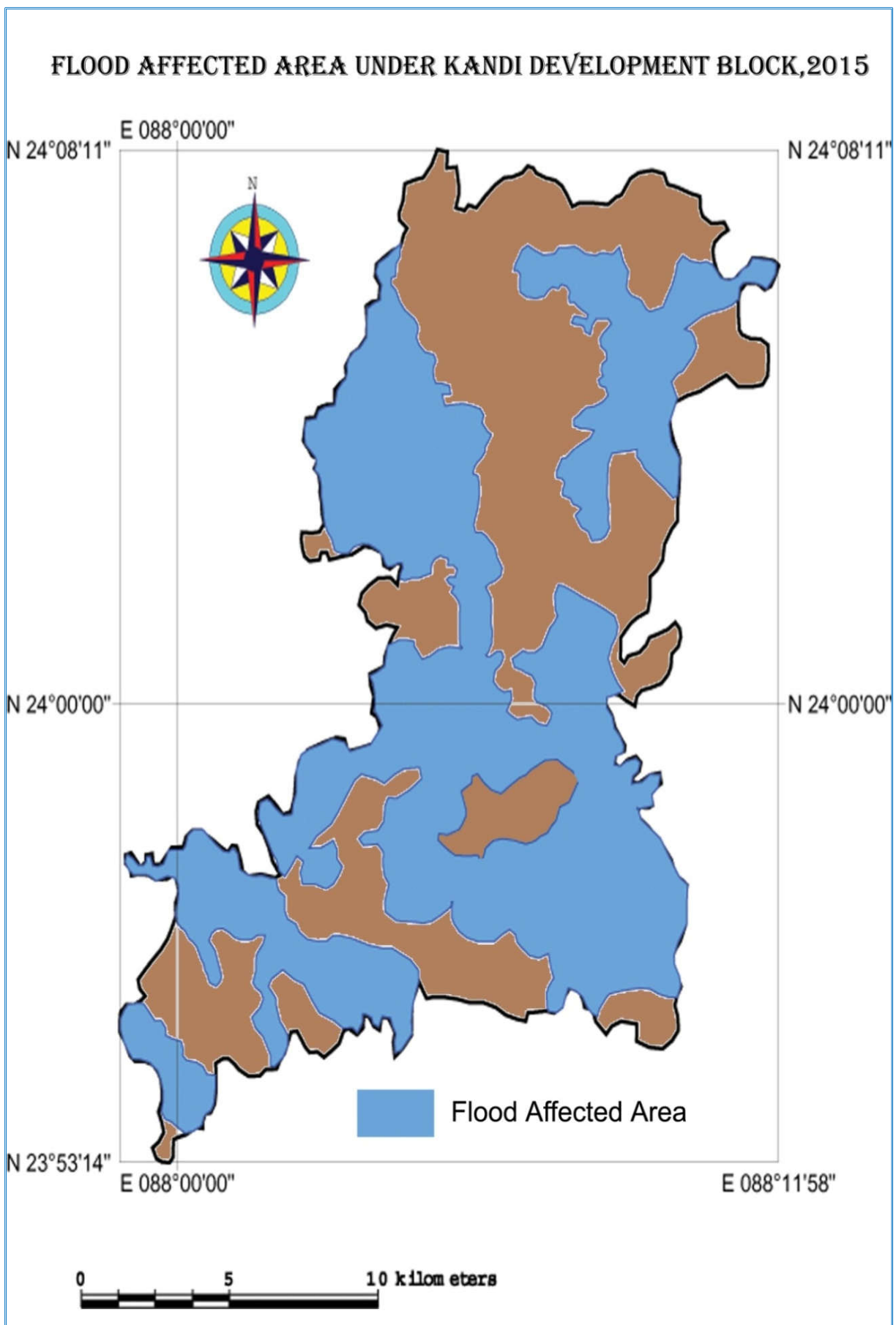


Fig. 5: Flood Affected Area in Kandi Development Block, 2015
Source: Block Development Office, Kandi



Plate 4. In a portion of Kandi block on flood's time (2015)

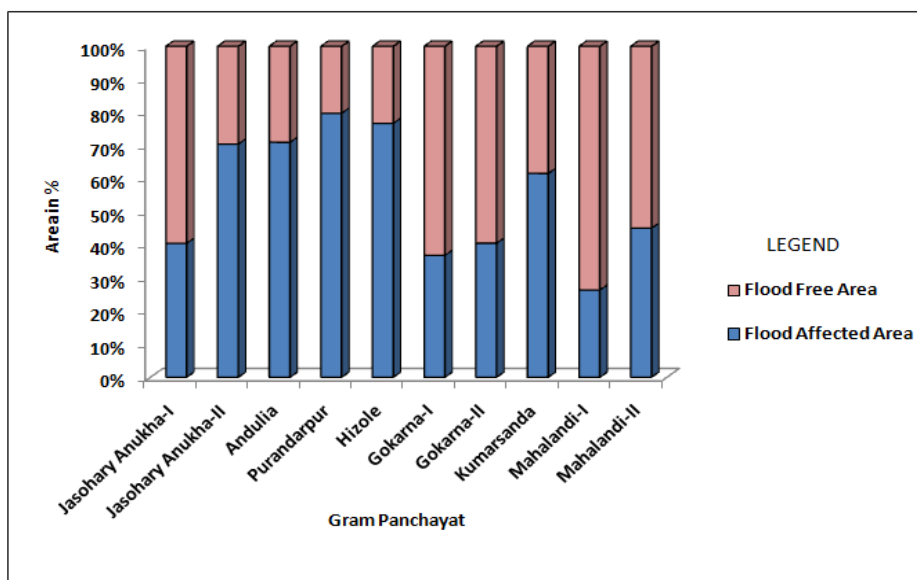


Fig. 6: Bar Graph Shows Flood Affected area of Different Gram Panchayat under Kandi Dev. Block (2015)



Plate 5: Destroy some houses in Kadi Block by Flood, 2015



Plate 6: Effect of flood on a portion of nature in Study Area (2015)

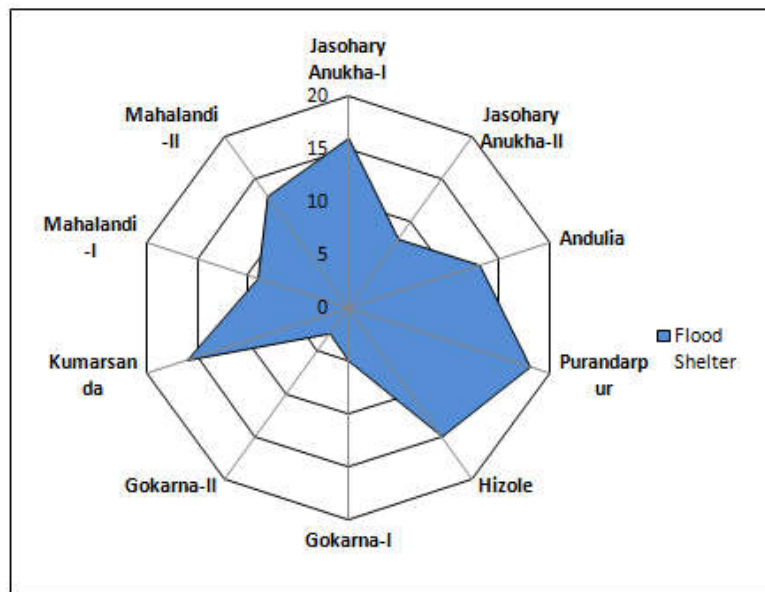


Fig. 7: Allocation of Flood Shelters in Kandi Dev. Block, 2015

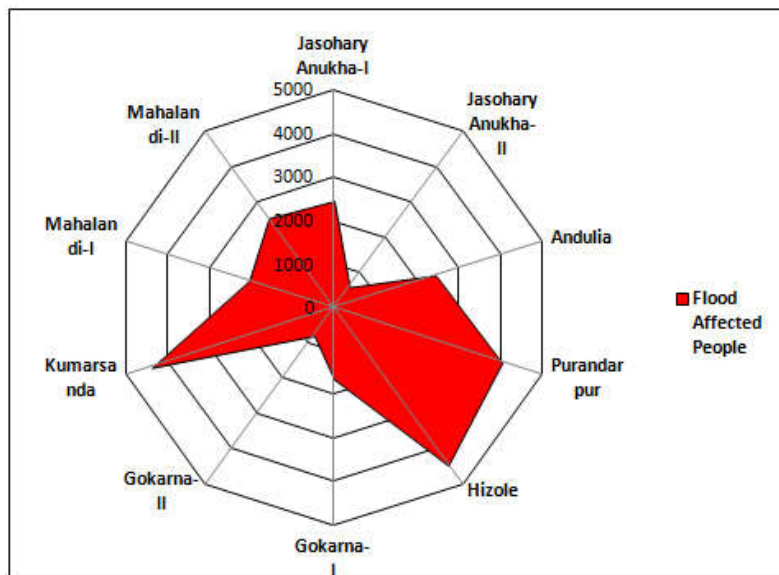


Fig. 8. Flood Affected People in Different Gram Panchayat of Kandi Dev. Block, 2015



Plate 7: A Flood Shelter in Kandi Development Block



Plate 8: Refuges at the time of Flood in Kandi



Plate 9: Food Catering in a Flood Shelter

Flood Affected Area

Total absolute area of Kandi Development Block is 238.54 sq/km. Also total flooded area is 162.51 sq/km (2015). Therefore the percentage of total flooded area is 68.13% (2015). The flood of 2015 in Kandi is covered almost all over in the block. According to Fig.4 It is showing. In the study area, flood is affected all Gram Panchayat more or less in 2015. The table 1 shows severe vulnerable flood more affect in Hizole gram panchayat, total affected area is 83.58%, there vulnerable villages are Gopalnagar, Benipur, Bajergopalnagar, Srikantapur, Harinagar, Bhabanandapur, Ranipur, Hizole and Srikrisnapur. Also purandarpur and Anduliya Gram Panchayat, nature of flood vulnerability is severe affecting area are 78.78% & 73.81% , most vulnerable villages are Ranagram, Indrahata, Chatore, Chandraprosandpur, Bhabanipur, Purandarpur, Parbaripur, Banti, Gobindapur, Jitpur, Rajarampur Chandnagar, Santoshpur, Durgapur, Andulia etc. The fig.6 shows that moderate vulnerability of flood affect are Gokarna-I, Kumarsanda, Jasohari Anukha-I, Mahalandi-II, Jasohari Anukha-II. No vulnerable in flood of Mahalandi-I Gram Panchayat(26.31%).

Flood affected people and shelter

In a region, at first flood affect in human society then peoples tried to a square shelter. As the study area is situated at the flood prone place, naturally during the flood's time create some flood shelter for sheltering some flood affected people. From the fig. 8 it has been observed that maximum peoples are affected by flood in Hizole, Purandarpur and Kumarsanda Gram Panchayat. Moderately affect by flood in Andulia, Jashori anukha-I, Mahalandi-I, Mahalandi-II. Least affect by flood in Gokarna-I, Gokarna-II and Jashori anikha-II. Many flood shelters are constructed at different flood prone Gram of this block. The primary and High Schools situated at the flood prone villages of this block are used as a shelter during Flood seasons. It has been found from the fig.7 that Maximum flood shelters are situated in Hizole, Purandarpur, Kumarsanda and Jashori anukha-I for sheltering the affected people.

Else another Gram Panchayats have some flood shelters in this block.

Conclusion

It maybe conclude that,

- Drainage density of Kandi Development block is match higher then the other block of Murshidabad district.
- Severe vulnerable flood showing all over the Kandi block in 2015.
- Many people are affected by flood and also create seasonal neo-refugees.
- Many flood shelters are constructed at different flood prone Gram of this block.

Preventive Measures and Human preparedness

- Strengthening and raising of crest of Panuti Mondalpur embankment (Mayurakshi left bank) from Talbona to Mondalpur of length 29.00km.

- Increase of vent of existing Railway Bridge in between Bazarsau and Tenya.
- Re-excavation of river Bele/babla from Sabitrinagar to Uttarasan off take (15.00 K.M. approx.)
- Re-excavation of river Uttarasan from its off take point to Bhagirathi outfall (11.50 K.M. approx.)
- Increase of vent of existing Kajipara Railway Bridge with a provision of sluice after re-excavation of the river as stated in point No.3 above including provision of more vent along the railway embankment.
- Retire of Natatala Chourigacha embankment at upper reach from 0.00 K.M. to 4.05 K.M.
- Distension pond at Gora beel of area 70.00 hectares (Avg. Height of G.L. 12.20 M.G.T.S.) for detaining flood with a steep gradient towards Gora beel. The stagnant/detained water may be used for irrigation during dry periods. The destination pond can be used for development of pisciculture and duck rearing. However proper reconnaissance on this stretch may be made for quick drainage and to safeguard the interest of the local people of this area.
- Confined elevated village to a good height (say 18.00 M.G.T.S.) may be made with sufficient area to accommodate the entire village, schools and other public utility centres with a future provision for extension near Andulia.
- Elimination of circuit embankments from Sehalai to Subitri Nagar for a length of about 10 Km (Sehalai – Tankurani Chak – Circuit Embankment) will also provide a huge area to accommodate spill water and thus huge expenditure for restoration of above embankment could be avoided.
- In flood prone Gram Panchayats tube-well have been sunk with raised platforms besides P.H.E takes their all out effort to supply water in pouch packets during flood.
- Medical team to address the problems of the flood affected people as well as for livestock shall be formed by the BMOH Kandi Block and BLDO Kandi Block respectively at pre during and post phases of flood incident.

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