

## **Project Title: ‘Fire Dynamics - Kolkata, an Overview’**

The project has been done under the Guidance of Dr. Bansari Guha.

The students who have done the research and completed the project are as follows:

1. Aditi Chatterjee
2. Ankita Paul
3. Arpita Bal
4. Bipasha Das
5. Sayani Goswami
6. Sreeja Pal

### **1.0 Preamble**

Fire symbolizes the dawn of human civilization. It acts as friend as well as foe to the mankind. Fire is a chemical reaction between whatever material is on fire and oxygen. Fire could be a man-made, natural and quasi- natural disaster that resulted in the loss of property and lives. It has been categorised into few types like A,B,C, D and K ..

Fire is a common hazard or disaster throughout the globe both in urban as well as in villages, but urban fires become more disastrous events causing huge loss of life and property. It also adversely affect environment.

The bustling city of Kolkata, India’ s oldest metropolitan city has experienced fire a number of times due to a number of reasons from cigarette smoking to storage of kerosene to faulty wiring and lack of proper disaster management system . Since Kolkata was the capital of British colony, CBD area, some portion of central Kolkata and in south up to Park street area were developed in a very planned manner. Afterwards with huge population growth, the metropolitan city expanded in unplanned haphazard manner. Subsequently with huge refugee immigration, created both notified slums and illegal ‘Bustees’ were sprung up with least amenities and safety. Narrow lanes and by lanes, old buildings in a dilapidated condition and illegal unplanned new construction without taking proper safety measures made Kolkata highly susceptible to fires at various levels in different parts of the city.

In this backdrop we have attempted to make study on fire incident characters of Kolkata Municipal Corporation area, henceforth would be referred as KOLKATA. The research would be based on the last decade between 2011 to June 2021.

### **2.0 Objectives:**

The objectives of the project are as follows:

- To make a register of Fire in Kolkata for the last decade, from 2011-2021
- To find the areas where fire incidents occur frequently
- To understand the pattern of fire cases
- To unearth the causes behind major fires
- To assess the vulnerability of people and areas
- To assess the hazard perception of people, media and policy makers about ‘Fire’ in Kolkata.
- To suggest few remedial measures to be helpful for preparedness, mitigation and

management strategies for the policy makers.

### **3.0 Methodology**

The entire research is based on secondary literatures. Data collected from these secondary data sources are processed both quantitative and qualitatively. Through simple diagrams statistical data were represented and analysed. For detail study, we have selected last decade (2011-2021) with few case studies.

At the outset, this must be mentioned here that due to pandemic situation no library or archives could be accessed for books, journals and other archival documents, much needed for any research. Thus, only option remained for us was to thoroughly depend on online data sources. Mainly Google searches in different cites led to collect most of the data. News reports help us most along with few articles, and books.

### **4.0 Spatial Distribution of Fires occurred in last decade**

Basically the fires which we have seen in this decade maybe classified under few categories. These are residential as well office buildings, markets, Godowns of factories, hospitals, hotels, slums etc. According to the map of Kolkata taken from Kolkata Municipal Corporation cite, it is evident that Godown-fires have been seen in almost every part of Kolkata. The most important hospital fires broke out in SSKM and AMRI hospital in south Kolkata where as in Calcutta Medical College in central Kolkata. There are quite a number of building fires both in central as well as in north Kolkata. Market fires are more prevalent in the central and north Kolkata. We also see some factory fires mainly in east and south Kolkata. There were also fires in some slum areas mainly in central Kolkata and some hotel fires in north and Central Kolkata.

From this observation it may be stated that the northern and central regions of Kolkata had the highest number of fires in the last 10 years.

From various reports, it is clear that in most of the cases of fire incidents in Kolkata, the causes are not identified by the disaster management team. Second in importance is short circuit. Other important causes remain gas and air condition burst. Faulty wiring system has been responsible for fire mostly in 2015 and 2019.

### **5.0 Risk Assessment and Vulnerability**

With a meagre data we have attempted to assess the risk and vulnerability of people for fire incidents. Central and north Kolkata share major part of old Kolkata consisting of very old buildings, narrow lanes and by lanes. Source of available water needed for fire fighting is scanty. High-drains are choked due to ill maintenance. It is very common to find a building with so many tenants where old wiring is hardly repaired and remained as it is. Safety measures are not taken because entire building has become no one's baby and turned into very high risk Zone. Narrow lanes restrict the movement of fire brigades. Acute congestion of buildings cause menace to rescue operation as well as extinguishing the fire.

Kolkata slums mainly the 'Bustees' are illegally made either along the rail lines both in north and south section and along the canals in north and east Kolkata. Major characteristics of

these 'bustees', starting from materials like nylon sheets for the shanties to cooking oil, oil used for lighting the room to hooking from the electric lines make the slum dwellers highly vulnerable. Monetary valuation-wise the loss of these kinds of slums cannot be compared with high rise building because they are the most marginalised people who are forced to live for their livelihood with little resource. They are least resilient thus the impact of loss is very high and thus need quite long time to cope up with the loss.

Since mid-1980s in South Kolkata sky scrapers and multi-storied building were constructed indiscriminately. Some of them are legal but most of them were illegally constructed. But still there are places left behind which may help in rescue, rehabilitation and reconstruction.

## **6.0 Disaster Management**

Fire disasters are managed by fire brigade personnel and local people. Because of high congestion and lack of water and extinguishers fire events in Kolkata have been converted into disasters. For proper management, following issues are to be given priority chronologically:

The community of high and moderate risk zone, the residents of old buildings and slum dwellers must be prepared for the event. They should know their places in details. They are to be trained in such a manner so that during any fire they know few facts such as which switches are to be made off, immediately inform fire brigades, the rooms where old people reside and the shortest route of rescue. Youth volunteers to be identified and trained.

These are ways to reduce the hazard by exerting some control over the processes involved. Regular monitoring of the fire sources of old building, hospitals, markets, Godowns and slums by the experts of Disaster management, Fire and Emergency services under Disaster Management Department, GoI and of West Bengal should be made. Modern machines and techniques must be introduced immediately to manage the fire incidents.

## **7.0 Conclusion**

The abovementioned details may suffice following few suggestions which may help the policy makers:

- Kolkata contains more than 4.5 million residents and floating population of 60,00,000/day. A substantial number of floating people are engaged in different sectors. With such a huge density, anybody can apprehend the state of vulnerability. 36 water supply installations are insufficient for combating the fire incidents i.e. average 7.9 per year.
- High risk zones must be categorized under micro zones so that mitigation can be properly made.
- Regular mock training of both the fire man as well as the community. Fire tenders must be regularly checked. More fire tenders are needed for 141 wards under 15 borough

## **A project report on Road Accident Hazard in Kolkata Metropolitan City**

Prepared by: Moumita Das, Pousali Debnath, Sushama Mali, Aysha Hasib, Arpita Maity, Moumita Mondal, Nisha Mondal and Paramadrita Majumdar; 6<sup>th</sup> semester 2021,

Under the supervision of Pradip Chandra Patra, Assistant Professor in Geography

### **1. Introduction:**

On September 11, 2001, the twin towers of the World Trade Center (USA) were destroyed and history recorded that over 3,000 people were killed. Not many people know that about the same number of people die every day on roads worldwide (WRAGRSP, 2002). Road traffic continues to be a major developmental issue, a public health concern and is a leading cause of death and injury across the World killing more than 1.35 million globally as reported in the Global Status report on Road Safety 2018 with 90% of these casualties taking place in the developing countries. As per the Road Accident Report 2019 govt. of India, a total no of 449002 accidents took place in the country during the calendar year 2019 leading to 151113 deaths and 451361 injuries. Globally 54% of accidents related deaths are pedestrians, cyclists and motor cyclist, results to economic losses not only to individuals, their families, but also to the nations as a whole (WHO). Kolkata has a long colonial history. In the greater part of the cases growth and development of transport network in this city was impromptu and haphazard. Most of the metropolitan cities in India are witnessing phenomenon of ever-increasing growth of vehicular traffic due to population explosion coupled with largescale socio-economic activities. The huge numbers of private vehicles, heterogeneous traffic and limited road space have led to the problem of congestion on the Indian city roads. The situation is no different in Kolkata. Kolkata has a high population density. The road space in Kolkata is only 6 per cent compared to Delhi and Mumbai, which have greater road space. High demand for mobility coupled with low road space leads to high congestion on the roads of Kolkata (Valli, P, P., 2005). Kolkata traffic systems controlled by traffic police, have been increasing day by day on the limited road space of the city of joy.

### **2. Study Area**

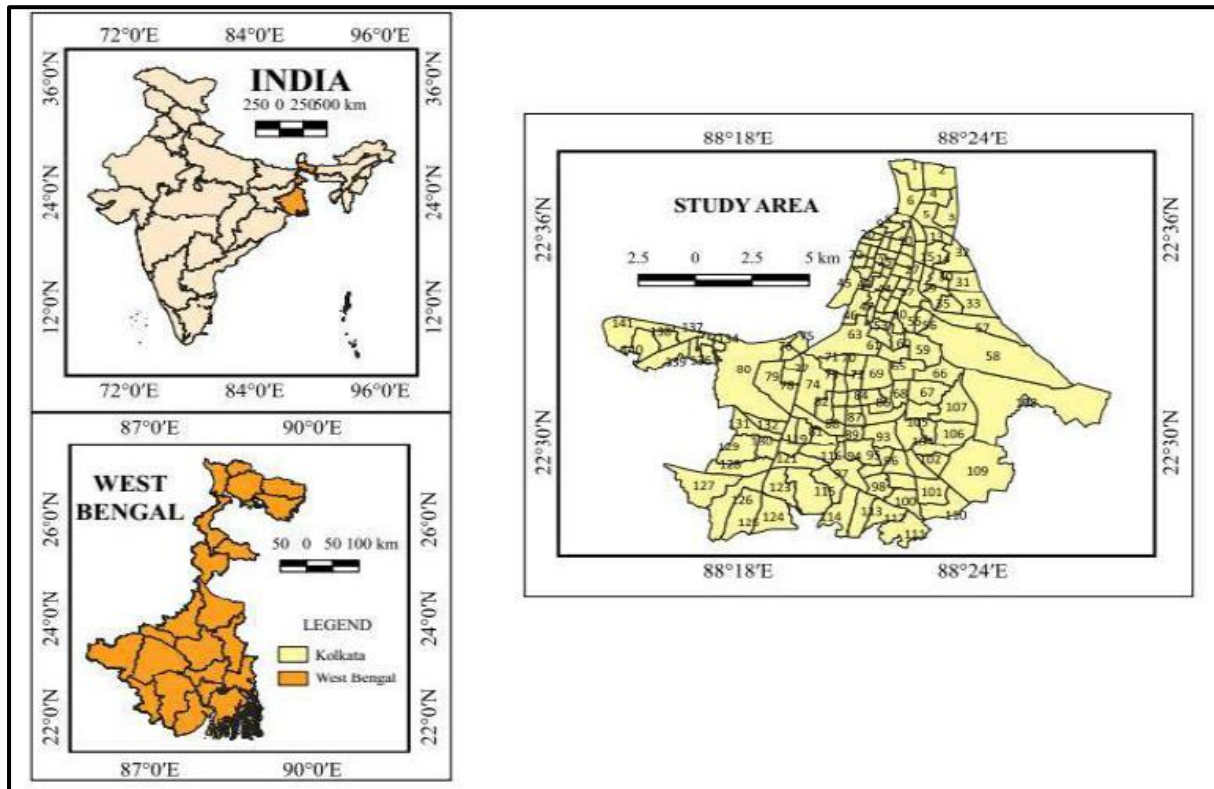
Kolkata is located in the eastern part of India. It is a large district of west Bengal and cultural capital of India. Kolkata is situated between 22°30'N to 22°36'N. Latitude and longitude of Kolkata is 88°18'E to 88°24'E. It has spread linearly along the bank of Hoogly river. In north and south the city is respectively a rounded by North 24 Parganas and South 24 Parganas and the Howrah district is situated western part of Kolkata. The Kolkata municipal corporation has an area of 206.1 square kilometres.

### **3. Objective of the study:**

The major objectives of the study are

- To study in pros and cons on different vehicles involved in accident
- To measure accident identification details

- To find out the disparity among the police stations, the current chapter incorporates the occurrences of all types of road traffic accident cases viz. fatal, grievous or major injury, minor injury and collision cases for the time span of 1997-2019 as categorized by Kolkata Police.



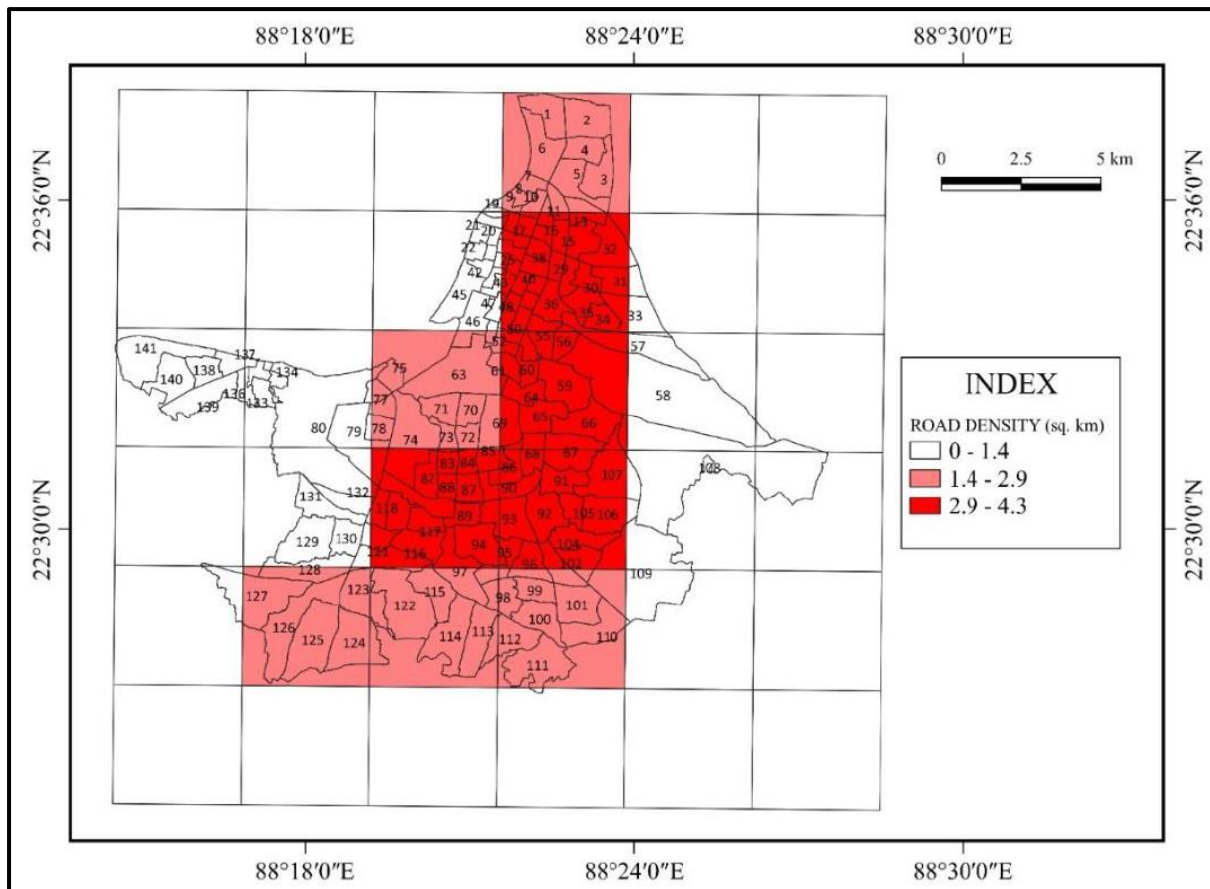
#### 4. Methodology

The present study is based on secondary data. The source of secondary are books, journals, different published documents and records etc. The data have been analysed by using appropriate quantitative techniques for clear exposition.

#### 5. Conclusion

It observed is observed that there was a total of 18 cases in West Bengal from 1997 to 2014. Based on the data we divided the road traffic accident into three categories. First one is Fatal, then Serious injury and last is Simple injury. In fatal cases 471 in 2012 is the highest rate where 498 people were affected by the accident and 341 is the lowest case in 2010 where 354 people were affected. In serious injury cases 1739 is the highest in 2013 where 2053 people were affected and 2002 has the least number of cases which is 620, where 678 people were affected. In simple injury cases 1998 year is the highest and 2005 year is the least number of cases. So, in total accidents 10999 is the highest number of accident cases which was in 1998 where 3990 people were affected and 2180 is the least number of cases which was in 2005, 2131 people were affected. In 2014 cases were lesser but the number of people who were affected is much higher than the year of 1998. So as per the data we can see that the years go by but the number

of incidents or accidents is decreasing but the number of people affected increases. Which is very harmful and hazardous.



A detailed discussion of the road traffic accidents in Kolkata has revealed not many similarities in accidents characteristics with the Indian circumstances and contrary to this there were little dissimilarities in contrast with to the conditions of all over India. The general accidents cases in Kolkata police jurisdiction have recorded decrease. It has been seen that with the enhancement of the percentages share of fatal and major injuries, non-injury and collision cases have progressively reduced, yet at the same time total accident cases has begun to decrease from 2004 onwards. It very well might be inferred that nature of vehicular involvement, casualties' tendency, accident seriousness and such attributes of road traffic in Kolkata contrasts from the rest of the nation or other megacities in India.

### References:

Valli, P, P., (2005): 'Road Accident Models for Large Metropolitan Cities of India', Iatss Research vol.29 no.1, pp. 59-65

World Road Association and Global Road Safety Partnership. Keep Death Off Your Roads. A PIARC/DFID/GRSP Publication. (2002).

Kolkata Traffic Police (2016) : Annual Review 2016, Kolkata.

Road accidents in India 2019: Govt. of India

## **Project Report on Flood and its Management in Lower Ajoy River Basin, West Bengal**

---- Prepared by the students of semester-VI, Geography Honours under the guidance Dr. Hasibur Rahaman Molla.

### **Name of the students:**

1. Tapati Midya
2. Amrita Dutta
3. Shreyosi Datta
4. Banami Ghosh
5. Isha Roy
6. Srijukta Karmakar
7. Rama Gayen

### **1. Introduction**

In South Asian countries, flood is a serious natural hazard. It is estimated that between 2 to 16 per cent of the GDP of different South Asian countries get wasted every year due to natural disaster (Chakraborty, 2006). Flood forms the major domain among all the natural disasters to take a heavy toll of lives and properties. In India, typical behavioural pattern of monsoon makes the country most vulnerable to flood. Lower Ajoy River Basin is a well-known flood prone area in West Bengal. Flood is the most common attribute of the hydrological cycle particularly in this part of the Subtropical areas where variability rainfall exceeds 25 per cent. The flood hazard comprises many aspects including structural and erosional damage, loss of life and other materials, disruption of socio-economic activities including transport and communication system and spoiling of agricultural land and so on (Hewitt and Burton, 1971).

### **2. The Study Area**

Ajoy River is one of the most important rivers of West Bengal. It is a right bank tributary of river Bhagirathi. River Ajoy with a length of about 299 km is originated from the eastern part of Chhotanagpur plateau, near Chakai hill, under the administrative jurisdiction of Monghyer district in Bihar and flowing down through Jharkhand state and it mixes up with Bhagirathi at Katwa of Burdwan district in West Bengal. Geographically, the Ajoy basin extends from 23°30' N. to 24°35' N. latitudes and from 86°15' E. to 88°20' E. longitudes. The total Ajoy river basin area is about 6221 square kilometres out of which only 43 % lies in West Bengal. In West Bengal this basin has a common water divide with Mayurakshi to the north & Damodar to the south. Ajoy is fed by five important tributaries namely Pathro, Jainti, Daura, Hinglo and Kunur. The long profile of river Ajoy shows a rapid change in channel gradient at the point of Pandabeswar. The average channel gradient above Pandabeswar is 1 in 713 and it suddenly decreases to 1 in 2273 from downstream of Pandabeswar. On the basis of this abrupt changing of slope the area below Pandabeswar (23°44' N, 87°17' E) has been demarcated as Lower Ajoy Basin (Mukherjee, 2002). It extends from 23°25' N. to 23°45' N. latitude and from 87°16' E. to 88°09' E. longitudes. The area below Pandabeswar is a remarkable flood prone zone of West Bengal and embankments have been constructed along both sides of the river at this stretch. On the contrary, the upper valley is free from embankment. So, for the present study, the Lower Ajoy River Basin (figure-1.1) has been considered as the study area which has extended from Pandabeswar to Katwa. Total length of the river in the study area is about 145 km. and the total area of Lower Ajoy Basin is about 2816.65 square kilometres. In Lower Ajoy River Basin there

are 14 C.D. blocks which comprise 619 moujas (table-1.1). Out of 14 C.D. blocks, 9 blocks are in Burdwan district and rests 5 blocks are in Birbhum district.

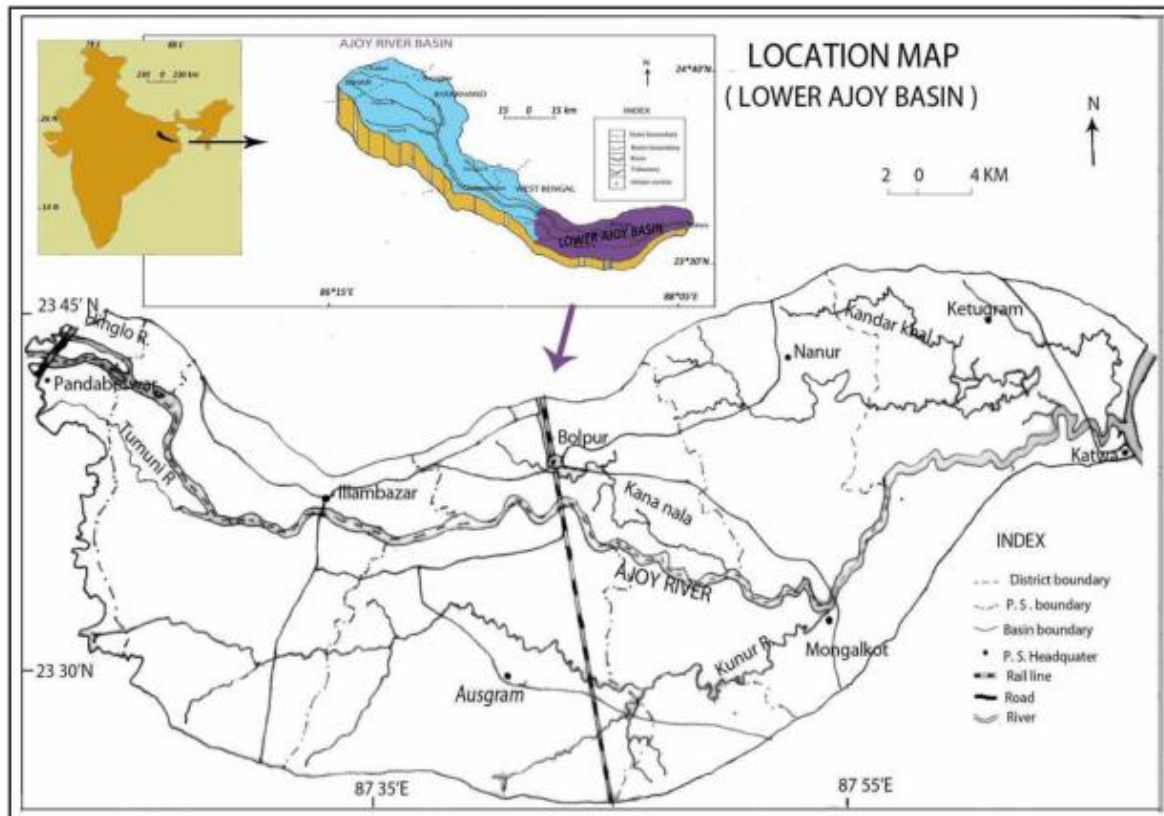


Figure: 1.1

### Objectives

The major objectives of the study are

- To analyse the present flood character of the study area.
- To provide clarity on roles and responsibilities for all stakeholders concerned with disaster management so that disasters can be managed more effectively.
- To create awareness and preparedness and provide advice and training to the agencies involved in disaster management and to the community.
- To propose some justified remedial measures.

### Database

Two types of secondary data have been collected.

a. Published data from various departments and authorities, like Directorate of River Research Institute, Govt. of West Bengal, Directorate of Irrigation and Waterways, Govt. of West Bengal, District Relief Department of Burdwan and Birbhum, Public Works Departments of Burdwan and Birbhum, Primary Health Centres of Mongolkot, Katwa, Illambazar, Nanur, etc., District Census Handbook of Burdwan and Birbhum, District Gazetteer of Burdwan and Birbhum, Geological Survey of India, etc.

b. Data related to outline maps, cartographic informations etc. from SOI toposheets of 1:50,000 (73 M/6, 73 M/10, 73 M/11, 73 M/14 , 73 M/15 , 79 A/2), and toposheet of 1924, NATMO, Indian Remote Sensing (IRS P6 LISS-III 2006) and satellite data from the Department



of Science and Technology, Govt. of West Bengal, Flood inundation outline maps from Directorate of Irrigation and Waterways, Government of West Bengal, etc.

## Methodology

The entire field work has been carried out through following stages:

- i. Pre-field work
- ii. Post field work

### Pre-field work:

In the pre-field work stage, different literatures, reports, articles, previous works related to this research have been studied intensively. Survey of India toposheets, district planning maps consulted for preparing the required base maps.

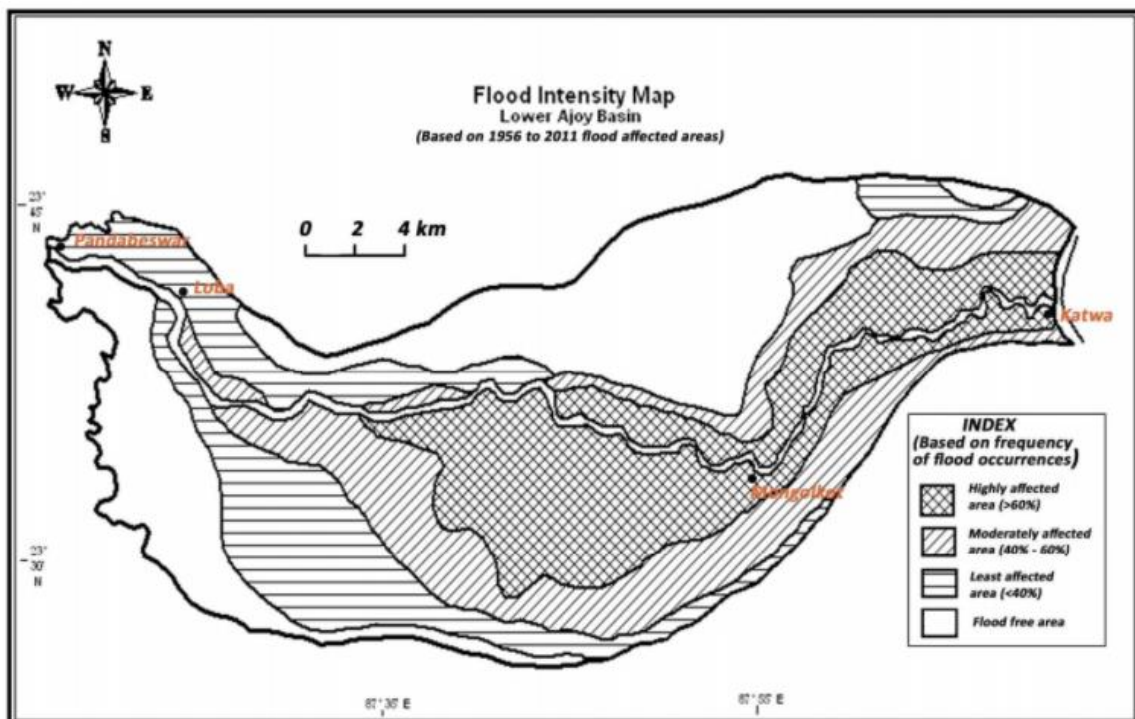
### Post field work:

In the post field work stage, various cartographic and statistical techniques have been implied for compiling and representing the secondary data. For handling the raw data, some sophisticated softwares like Ms Excel, Photoshop, Q-GIS have been used.

## Flood character in Lower Ajoy Basin

Lower Ajoy River Basin is a well known flood prone area in West Bengal. From the records of Irrigation and Waterways Department, Government of West Bengal, it is evident that the major floods occurred in the river basin in the year of 1956, 1959, 1970, 1971, 1973, 1978, 1984, 1999, 2000, 2006 and 2011. In 20th century before Independence, high floods occurred in this basin in 1913, 1916, 1938, 1942, and 1946. Some of the earlier recorded major flood years of 19th century are 1876, 1877, 1885, and 1896.

The nature of flood in Lower Ajoy Basin shows a typical changing pattern since 1956. Though several flood years have been recorded in the Lower Ajoy Basin, but the floods occurred in the year of 1978, 1995, 1999 and 2000 were most devastating in nature.



## Conclusion:

As flood cannot be totally controlled and it is not possible to provide protection against all magnitude of flood, we have to adjust with the flood and implementation of proper flood management programmes become very much necessary. Preparation of floodplain zoning map is an important non-structural measure to mitigate flood hazard. Degree of vulnerability of flood can be identified by demarcating the high, medium, and low flood prone zone and proper planning of land-use of the individual zone can be made accordingly. Government should launch different insurance packages for the people living in different flood prone zone. Thus, the traditional sectoral planning approach for complete flood control should be changed to sustainable flood plain development policy (Haque et al., 1993). A change of flood protection paradigms is utmost necessary. Instead of making trifling attempts to control floods by embankment, flood management policies should be implemented holistically to adjust with floods.

## REFERENCES

1. Chakraborty, P.G. (2006): Welcome Address Presented at the South Asian Policy Dialogue on Regional Risk Reduction, Vigyan Bhavan, New Delhi, 21 – 23 August.
2. Haque, C. Emdad and Zaman, M.Q (1993): “Human Response to Riverine Hazard in Bangladesh, A Proposal for Sustainable Flood Plain Development”, World Development, vol-21, No. 1, pp. 103 – 121
3. Hewitt, K. and Burton, I. (1971): The Hazardness of place: A Regional Ecology of Damaging Events, University of Jorants, Dept. of Geography, Research publication 5. p. 154.
4. Molla, H.R. (2010): “Delineation and Zonation of Flood Prone Area of Lower Ajoy River Basin”. ‘Practising Geographer’, Journal of the Indian Geographical Foundation, Kolkata. Vol. 14. No. 2. pp. 63 – 70.
5. Mukherjee, M. (2002): “ Flood of Lower Ajoy basin: A Spatio-Temporal Analysis Since Independence.” Unpublished Thesis. Dept. of Geography, Visva-Bharati University, Santiniketan. pp. 250.
6. Technical Report-Ajoy Project. (1985): Geological Survey of India (G.S.I.) -1985.
7. UNDP. (2003): UNDP-Project on Brick Industry in Bangladesh - <http://www.undp.org.bd/projects/prodocs/BrickKiln/IKEMBI%20Project%20Brochure.pdf>