

Impacts and Risk Management of Flood in Daspur-I Block, Paschim Medinipur

Barsha Bhattacharyya

Research Scholar, Department of Geography, OPJS University, Churu, Rajasthan, India
Assistant Professor, Bengal College of Teacher Education, Paschim Medinipur, West Bengal, India
Email: [barsha.bhattacharya27\[at\]gmail.com](mailto:barsha.bhattacharya27[at]gmail.com)

Abstract: *This study examines the impacts and risk management of recurring floods in Daspur-I Block, Paschim Medinipur, West Bengal. The objective is to assess socio-economic vulnerability and propose effective mitigation strategies. Data were collected from government records, field surveys across ten Gram Panchayats, and secondary sources. Both quantitative and qualitative methods were applied to analyze flood impacts on population, agriculture, infrastructure, and livelihoods. Results show that nearly 50% of mouzas are affected annually, with significant damage to crops, housing, and communication systems. The study identifies gaps in preparedness and highlights the importance of early warning systems and integrated planning. The proposed Long Term-Short Term- Emergency (L-S-E) Flood Management Plan and improved flood warning techniques can reduce vulnerability and enhance resilience in the region.*

Keywords: Flood Vulnerability, Daspur-I Block, Disaster Preparedness, Rural Livelihoods, Flood Warning Technique.

1. Introduction

Floods are a type of natural disaster. When water levels rise in the channels and overflow, flooding land and populated areas, dangerous inundation conditions occur. When river channels and streams cannot accommodate the extra water, surface runoff spreads onto adjacent low-lying floodplains. Flood-affected residents face significant daily challenges. Public buildings, educational institutions, electric equipment, tube wells, motors, pumps, agricultural crops, roadways, and communication systems are all severely damaged by floods. Additionally, business activity is significantly impacted by floods. As a result, individuals have endured extended periods of financial hardship and unfavorable circumstances.

2. Literature Review

Mal Sibsankar et al. (2013). Investigated the people's perception of flood risks in the Daspur-I Block and their attitudes, perceptions about flood prevention and flood management and concluded that flood management lies in an integrated approach and joint actions of both the Government and Public sides. Flood risk management needs to be considered within development strategies and planning at all levels. An integrated approach to flood protection and rapid technical development requires the additional education of experts and improved public knowledge about floods.

Dolui Gour et al. (2013). Investigated the flood and its effects on Ghatal Block and concluded that the critical drainage pattern of the Silabati River and monsoonal climatic fluctuation are the main causes of floods in Ghatal Block, which may affect not only sudden devastating damages but also long term effects such as water contamination and an unhealthy environment. During the rainy season in this area, it is affected by structural damages including house damages, crop failure and loss of production, damage of the road and communication system.

Therefore, people suffered for a long time from economic loss and an unhealthy environment.

Chakraborty Suvankar (2015). Investigated people's role in flood control and management in West Bengal and concluded that early flooding occurs due to excessive rainfall causing water-logging of farmlands and mounting pressure due to overflow of water. The State Government should pay more attention towards increasing the capacity of the channel through the improvement of drainage. Community-based preparedness for facing the flood in the lower basin of the Damodar, which will help in minimizing losses of property and life of human beings and livestock and also in reducing the recurring expenditure on flood relief.

Singh Shailender (2018). Investigated the flood in India and its impact on human life and concluded that floods impact both individuals and communities and have social, economic, and environmental consequences. It ruins states' already impoverished economy and finances completely or partially. Many lives are lost, many people lose their houses, and the livelihood of many gets ruined.

Das Souvik (2019). Investigated the causes of the devastating flood and the management procedure of Khanakul-I & II Block, Arambag Sub Division, Hooghly, West Bengal and concluded that lack of proper management of channels, lack of consciousness and poor condition of embankments make disasters in this vulnerable zone. Actually, proper and scientific management of floods and floodplains can reduce the damage and give stable relief for human civilization.

Ray Kamaljit et al. (2019). Investigated the causes of four recent extreme floods in India and concluded that extreme climatic events are bound to produce excess surface run-off and flooding. The effect of flooding varies due to local geomorphology and level of natural landscape encroachment. The rapid urbanization and indiscriminate encroachment of natural pathways of drainage are bound to

cause clogging of surface runoff leading to spillover and flooding.

Gayen Sumita et al. (2022). Investigated flood risk assessment and its mapping in Purba Medinipur District, West Bengal, India and concluded that to reduce the vulnerability from floods, the primary requirement is to develop infrastructure to adapt people to the inundation conditions. Another important remedial measure is to enhance economic development. These adaptive measures can help to minimize flood vulnerability and may be useful in the planning ecosystem.

3. Research Gap

Over the past few years, Daspur-I Block has experienced seven high occurrences of floods. A few research works were done on the flood in Daspur-I Block prior to my work. For the past few years, however, the characteristics of the relief and the floods that were impacted have not been examined. Inadequate flood control plans were created. Further research is required to fully comprehend the various flood-affected and relief features by year and to create appropriate management measures.

4. Objectives

- Assess the impact of flooding on the socioeconomic vulnerability of Daspur-I Block.
- Develop effective flood management strategies to combat the flood in Daspur-I Block.

5. Study Area

Out of the five blocks of the Ghatal Sub-Division of the Paschim Medinipur District, Daspur-I Block is a significant block. The area is surrounded by five rain-fed rivers, and it is located 25 kilometers north of Panskura Station on the South-Eastern Railway. The state highways that connect it are the Ghatal-Panskura and Ghatal-Medinipur roads, respectively. Ghatal Block is located on the north side, Debra Block is located on the south side, Daspur-II Block is

located on the east side, and Keshpur Block is located on the west side.

6. Methodology of the Study

The study is based on a field survey that was carried out in various Daspur-I Block Gram Panchayats. Data were gathered from various Gram Panchayat Offices, Daspur-I Block Office, the Department of Irrigation, census record (2011), and the Block Disaster Management Handbook 2022. The data was tabulated to create various diagrams of the villages affected, population affected, crop area damaged, houses damaged, roads damaged, total loss etc. Descriptive Statistics, Quantitative and Qualitative methodological principles are adopted for this study.

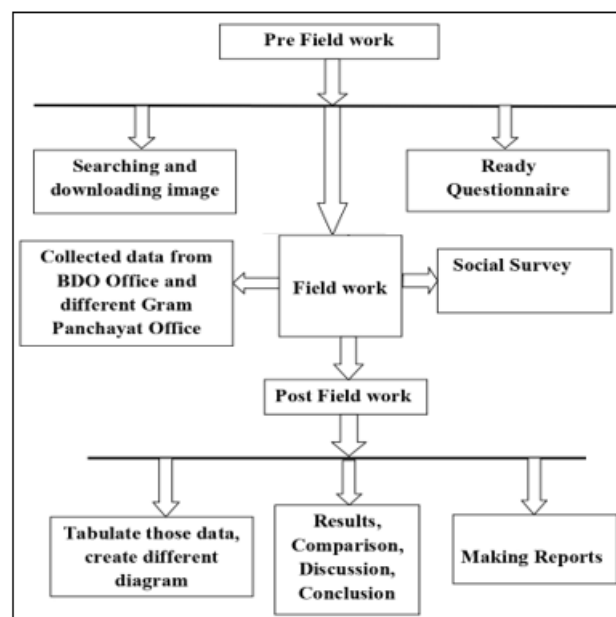


Figure 1: Flow Chart of Methodology (Source: made by the Investigator)

7. Results & Discussions

Different flood-affected and relief characteristics for the last few years have been analysed below:

Table 1: Flood Affected Characteristics in Daspur-I Block (Data Source: Office of the Daspur-I Development Block)

Year of heavy flood occurrence	2011	2013	2015	2017	2019	2020	2021
No of Villages affected	63	69	132	118	96	143	162
No of Population affected	39000	36000	92724	34279	19220	58922	42382
No of Human life lost	3	1	2	1	0	0	3
Crop Area damaged in Hec	10713	16137	6990	1760	2372	1325	4215
No. of House damaged(Fully)	1325	1595	1395	56	0	642	158
No. of House damaged(Partly)	3580	5563	4176	752	471	4169	1630
Road Damaged (Pitch, Morrum, Earth) in Km	490	178.5	35	99.45	0	0	100
River Embankment Damaged in Ft	310	620	2000	250	0	0	6180
Total Loss (In Core)	3.74	101.17	21.97	7.72	.56	21.45	40.43
No of Pond affected	0	1180	0	110	0	0	620
No of Tubewell Damaged	0	725	1044	1012	0	0	1374

Table 2: Flood Relief Characteristics in Daspur-I Block
(Data Source: Office of the Daspur-I Development Block)

Year of heavy flood occurrence	2011	2013	2015	2017	2019	2020	2021
No of Relief Camps opened	3	12	3	13	0	12	10
No of Person rescued	0	868	140	489	0	528	164
No of Person in relief camp	0	868	140	489	0	528	442
No of Tarpaulin distributed	2000	5314	2120	3950	700	425	4220
Sp GR(Rice) distributed in Qtl	4131.90	140	150	140	0	155	225
No of Boat deployed for evacuation	16	26	17	22	0	0	12

8. Socio-Economic Impacts of Flood

District are severely impacted by frequent flooding, which causes several social, economic, and infrastructure problems. More than half of Mouzas are submerged in floodwaters.

8.1 Effects on villages

Every year, from July to October, the villages of Daspur-I Block under Ghatal Sub-Division in Paschim Medinipur

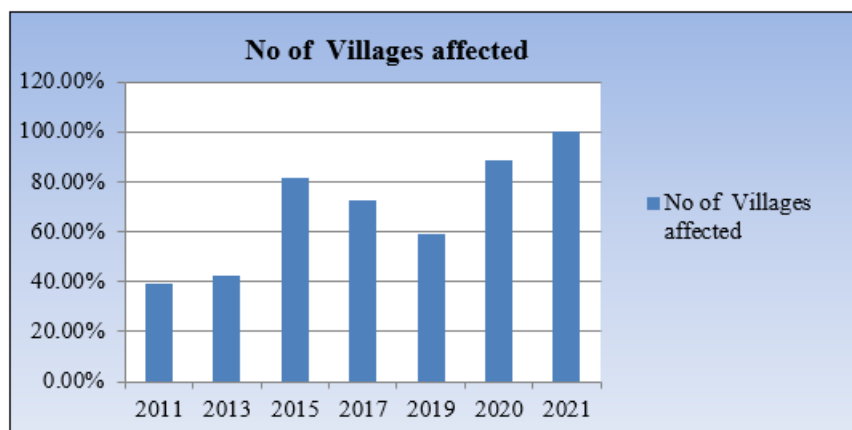


Figure 2: Villages affected

8.2 Effects on Population

Many people have been affected by the flood and have relocated away from the flood zone.

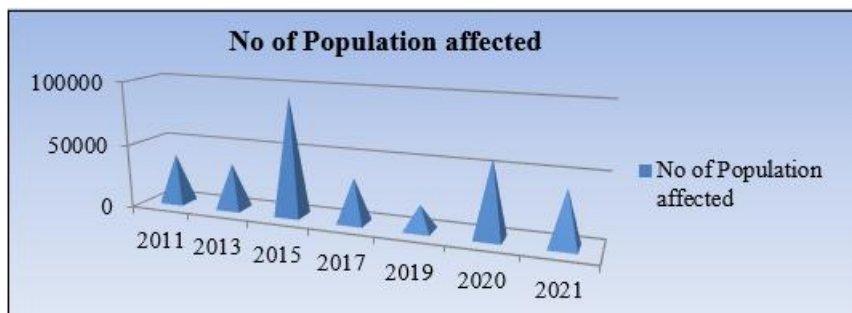


Figure 3: Population affected

8.3 Effects on Agricultural Practices

Most of the people in our study area are mainly dependent on agricultural practices. But every year, it is disrupted due to flooding. On the one hand, the flood damages the cultivated land, while on the other hand, a large number of

crops are damaged. The incidence of floods in the Daspur-I Block area increases every year. That's why people here are increasingly inclined to harvest Rabi crops instead of Kharif crops. About 70% of agricultural land is situated in low-lying areas, so this land is under water for about 2-3 months of every year.

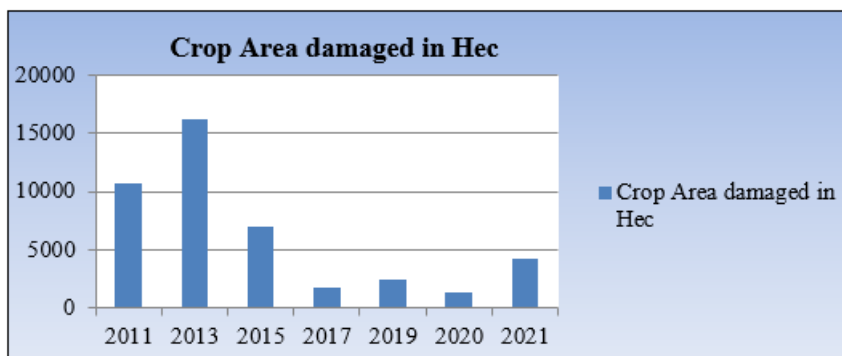


Figure 4: Crop Area damaged

8.4 Effects on Houses

Many mud houses collapsed in the Daspur-I Block area due to the flooding. Every year, new houses are built, and every year, floods destroy them. The villagers in this area believe it is their destiny. Concrete houses were also destroyed in

small numbers. People do not even have time to rebuild their homes because of multiple floods in the same year. As a result, they must spend 1-2 months in relief camps or rehabilitation centres. This situation has an impact on the entire system.

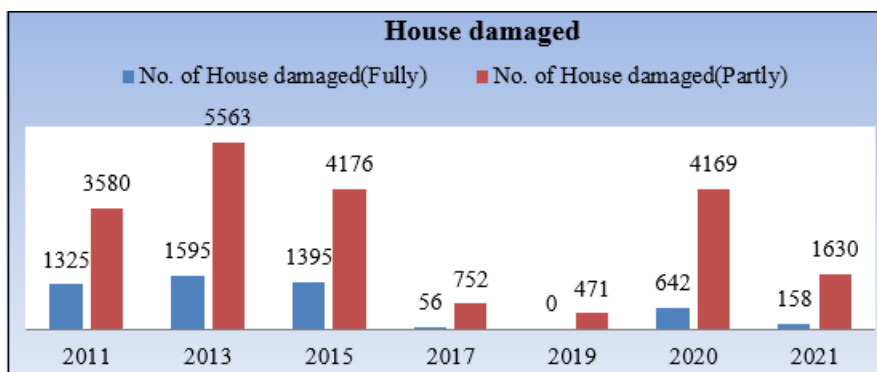


Figure 5: House damaged (Fully and Partly)

8.5 Effects on Transport and Communication Systems

The transport and communication systems were completely damaged by the floods. During the rainy season, flooding or flood-like situations occur and flood water flows over the road. The communication system becomes completely disconnected. People have no other means of communication other than boats. Floodwater causes extensive damage to the pitch roads. As a result, Daspur Town became detached from the District Headquarters at Midnapur Town. Those who travel in this way face lots of problems. Local market systems are severely disrupted. People suffer in their daily lives.

8.6 Effects on Economy

Flooding in the Daspur-I Block of the Ghatal Sub-Division in Paschim Medinipur has a deeply destabilizing effect on the local economy, which is primarily agrarian and heavily dependent on seasonal cultivation. When floods destroy standing crops, farmers lose not only their current income but also the investment made in seeds, fertilizers, and labour. This leads to a ripple effect, reducing purchasing power and slowing down local trade and market activities. Agricultural labourers, who rely on daily wages, face sudden unemployment during and after floods, resulting in increased financial insecurity and temporary migration in search of work.

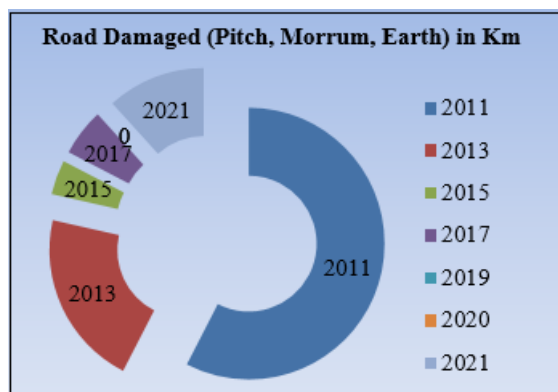


Figure 6: Road Damaged (Pitch, Morrum, Earth) in Km

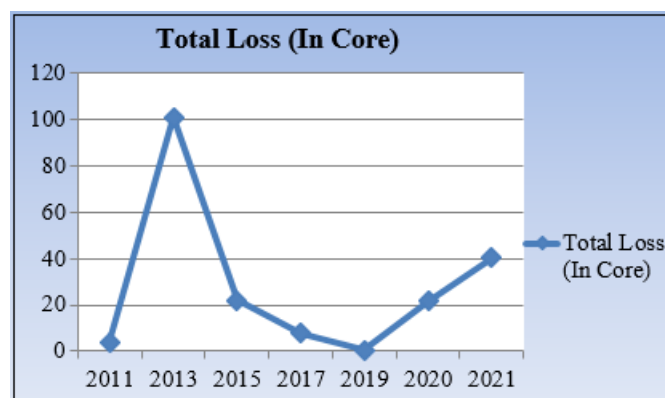


Figure 7: Total Loss (In Core)

8.7 Effects on the Health System

Significant health impacts occur by water accumulation for a long time. Floods usually cause diarrhea, cholera, food poisoning, and other water-borne diseases. Snake bites are a common occurrence during this period every year. Due to the disconnection of the communication system, many lives have to be lost before being taken to the doctor. Other medical opportunities are also hampered. Vaccination of children or the immunisation programme of children is disrupted. After floods, outbreaks of mosquito-borne diseases occur.

8.8 Effects on Animals

Animals, both stray and domesticated, are greatly impacted by flooding in Daspur-I Block, Paschim Medinipur. Many of these animals are essential to daily life and the rural economy. Animals frequently have little opportunity to flee as floodwaters rise quickly, which causes livestock including cows, goats, and chickens to drown. In addition to causing immediate financial hardship for farming families, the loss of livestock also interferes with plowing, milk production, and other agricultural tasks that depend on animal work. During and after floods, surviving animals frequently suffer from malnourishment and famine due to broken fodder stores and inundated grazing pastures.

Due to exposure to tainted water and overcrowded shelters, veterinary care becomes mainly unavailable, and illness outbreaks such as leptospirosis, anthrax, or foot-and-mouth disease are frequent. When animals do live, they frequently

have wounds or diseases that are left untreated due to a lack of adequate rural veterinary care. Rescue and relief efforts are made more difficult by the fact that stray animals, such as dogs and livestock, are also severely impacted and frequently wander around flooded settlements in despair. The longer-term stability of rural livelihoods is impacted by the sluggish recovery of livestock populations and animal health following flooding.

8.9 Effects on the Educational System:

The education system is also heavily disrupted due to frequent floods. During this time, all schools are closed for almost one or one and a half months because all these schools are used for relief camps and flood-affected people who lost their houses. Most of the houses in the study area are under water. Because of that, the entire education system is severely disrupted. It has also been seen that most students go to school in knee-deep water even when the floodwaters recede.

9. Flood Warning Technique

Delivering the flood warning message from the higher authorities to the villagers is a critical task in the fight against flooding. Timely delivery of flood warnings to the right people at the right time, we can reduce the severity of the flood. Here, a flowchart technique is used to send flood warning messages from higher authorities to villagers via e-mail/Fax/SMS/Whatsapp/Miking, as appropriate.

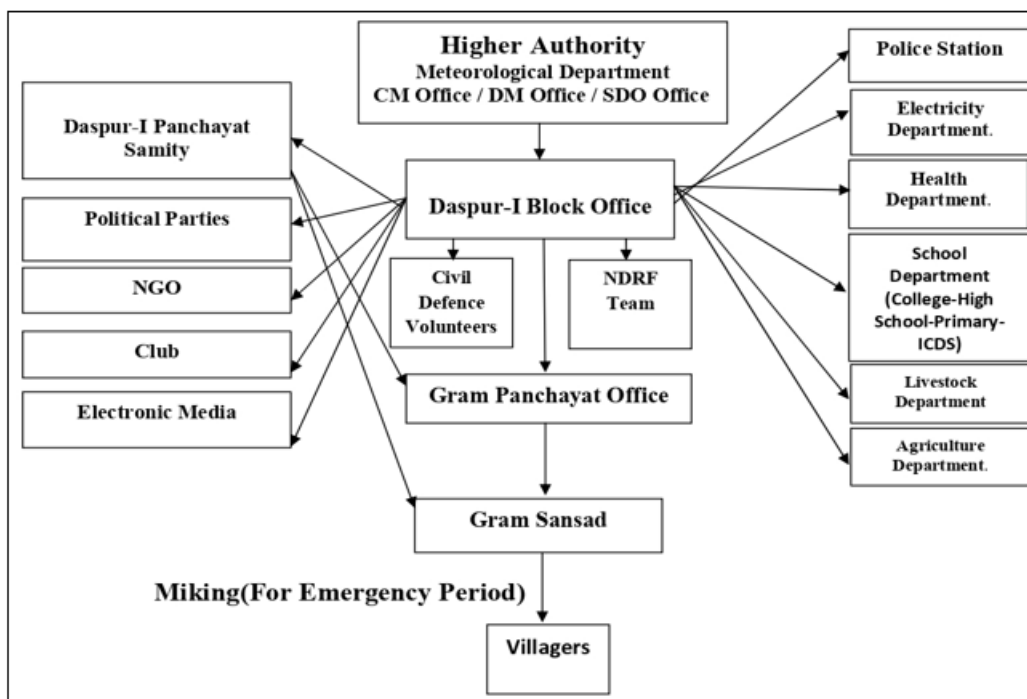


Figure 9: Flood Warning Technique Flow Chart (By e-mail/ Fax/ SMS/Whatsapp/ Messenger) (Source: made by the Investigator)

10. Flood Management Strategies

Long Term-Short Term-Emergency Flood Management Plan (L-S-E Flood Management Plan)

Long Term Flood Management Plan (Before Flood)

- Re-excavation of drainage rivers and channels.
- Improvement of river embankments.
- Construction of guard wall on the river embankments.
- Removal of unauthorised construction on the river embankments.
- Widening of waterways of existing bridges and construction of new bridges.
- Provision of regulators of major outfall sluices.
- Tree plantation near embankments and roads for decreasing soil erosion.
- Construction of Lock Gate on the river.
- Construction of Flood Shelter or Rescue Shelter.
- Implementing Flood Insurance.

Short Term Flood Management Plan (Before Flood)

- Forming Block Level Disaster Management Committee.
- Arrangement of different Flood Awareness Programme at Block Office, Gram Panchayat Office or NGOs.
- Prepare Flood Mapping Zone.
- Prepare Vulnerability Map.
- Prepare Disaster Communication Plan.
- Prepare a telephone directory having emergency and important contact no.
- Flood Forecasting through E-mail/ Fax/ SMS/ Whatsapp / Messenger /Miking by the Block & Local Gram Panchayat Administration.
- Shifting of people to safe places or relief camps before the occurrence of Flood.

Emergency Flood Management Plan (During and After Flood)

- Arrangement for Ambulance, Boat, Life Jacket, Generator, Relief Materials etc.
- Operation of round-the-clock control room during flood-like situations at Block and Gram Panchayat Offices.
- Rescue operation through Civil Defence Volunteers and NDRF Team.
- Distribution of proper relief materials to needy and affected people
- Make arrangements for repairing the electric pole, wire and other electrical equipment for starting the electric power system as early as possible.
- Make arrangements for repairing roads so that the communication system can be operational as soon as possible.
- Arrangement for repairing of houses as a necessity for the flood affected peoples.
- Arrangement to begin providing free medical services to the flood affected peoples and animals.



Pic 1: People were rescued at Flood Shelter (Nij-Narajole GP)



Pic 2: In action was the NDRF team



Pic 3: Khechuri distributed to flood affected peoples



Pic 4: The Lifeboat prepared for a rescue operation
Picture (1-4): Different types of Flood Management Activities

(Data Source: Office of the Daspur-I Development Block)

11. Conclusion

The study reveals that Daspur-I Block experiences frequent and severe flooding, affecting nearly half of its mouzas annually and causing major socio-economic disruption. Agriculture, housing, infrastructure, and public services are consistently impacted. The findings highlight the need for integrated flood management strategies, improved early warning systems, and strengthened local preparedness. While flood events cannot be fully prevented, their impacts can be reduced through coordinated planning, infrastructure improvement, and community awareness. The proposed Long Term-Short Term-Emergency (L-S-E) Flood Management Plan offers a practical framework to enhance resilience and reduce future risks.

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