



IMPACT OF THE 2024 TRIPURA FLOODS ON AGRICULTURAL LIVELIHOODS: AN ASSESSMENT FROM JOLAIBARI BLOCK, TRIPURA

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ABSTRACT

The August 2024 floods in Tripura were a severe disaster for the state, profoundly impacting the agricultural livelihoods of farmers. This research focused on the severely affected Jolaibari Block of South Tripura District. The study was conducted using surveys of 105 affected farmers from three Gram Panchayats in Jolaibari Block and quantifies the flood impacts. Key findings show that nearly 90% of households suffered significant income losses, with damage to paddy, vegetable, and fisheries sectors. The post-flood situation was heart-wrenching for farmers due to severely hindered recovery of waterlogged fields, soil erosion, soil covered with mud and debris, combined with damage to livestock, seeds, and irrigation.

To cope with the livelihood damages, farmers relied on multifaceted strategies such as temporary migration, informal borrowing, and food credit. Even after five months, a quarter of households continued to struggle to restore their livelihoods. Crucially, government aid (insurance, seed distribution, input support) managed to reach less than half of the affected households, revealing significant gaps. This research highlights the immediate need for an integrated policy approach, including strengthened insurance, financial aid, climate-resilient agriculture, and livelihood diversification, to build resilience among small and marginal farmers in Tripura's flood-prone areas.

KEY WORD: Tripura Floods 2024, Agricultural Livelihoods, Flood impact, Coping Strategies, Livelihood resumption, Disaster resilience, Community preparedness

1. INTRODUCTION

Floods are among the most frequent and devastating natural disasters affecting communities in both rural and urban areas across the world. According to Liu et al. (2024), from 1990 to 2022, floods affected over 3.2 billion people globally and caused more than two lakh fatalities, resulting in economic losses exceeding US\$1.3 trillion. After China, India faces the world's second-highest flood risk, with 629 million people affected and an estimated \$115 billion in economic damages. Therefore, in India, floods are considered one of the most recurrent hazards, causing extensive damage to lives, livelihoods, and infrastructure. According to CRED (2025), the floods that occurred very recently in late August 2024 affected over 8 million people in India, representing the most significant impact from floods that year.

Owing to its diverse agro-climatic zones and extensive river networks, India remains highly vulnerable to flooding. Nearly 40 million hectares (mha) of land in India are classified as flood-prone, accounting for about 12.15% of the country's total geographical area (NDMA, 2025). Since Indian agriculture is largely dependent on the monsoon, floods during this season pose a serious threat to both food security and the livelihood sustainability of farmers. Agriculture ranks as the largest sector in employment generation in India, employing about 46.1% of the population. Despite its shrinking share in GDP, agriculture still contributes 18.2% to the country's GDP (Ministry of Finance, 2024). Prolonged monsoon rains and recurring floods severely disrupted agricultural activities, delaying sowing and transplanting while also leading to waterlogging, soil erosion, and the leaching of vital nutrients. The excessive moisture created conditions favorable for pests and diseases, further amplifying crop losses. As per the Report of the Central Water Commission (CWC), an average of 4.055 million hectares of cropped area in India are affected by floods annually, resulting in average crop losses worth approximately ₹1933.26 crore (CWC, 2022).

According to the Planning Commission's Working Group on Flood Management and Region-Specific Issues for the XII Plan and Central Water Commission (CWC) flood statistics, the major flood-prone states in India include



Bihar, Assam, Uttar Pradesh, Maharashtra, Odisha, West Bengal, Andhra Pradesh, Punjab, Haryana, and Gujarat. In addition, states such as Jharkhand, Kerala, Jammu & Kashmir, and Maharashtra are also significant flood-prone areas. Among the North Eastern states, Assam experiences severe annual flooding, with about 40% of its geographical area affected by floods. Other North Eastern states also suffer from flood-related fatalities and landslides. States like Arunachal Pradesh, Manipur, and Tripura have smaller geographical areas but face frequent riverine floods during intense rainfall events.

Tripura, despite being a small state, remains highly vulnerable to floods. Data from the Central Water Commission (1953–2020) reflects the scale of devastation, with nearly 2.3 million hectares of land and about 15 million people affected during this period. The state recorded crop losses exceeding ₹6,800 crore, damage to nearly 106,000 houses, and the loss of more than 103,000 cattle, which are crucial to rural livelihoods. While the 2018 floods were among the most catastrophic, the state again faced a severe disaster in August 2024, when unprecedented rainfall triggered widespread flooding across eight districts. Around 1.7 million people were affected, with over 77,000 taking shelter in relief camps. The worst-hit areas included South Tripura, Gomati, Khowai, and West Tripura, where the disaster claimed 36 lives. Agricultural damage was extensive, submerging nearly 5,000 hectares of vegetables and 1.20 lakh hectares of paddy fields (Sphere India, 2024;). For a state with a predominantly agrarian economy and sensitive border geography, such recurrent agricultural losses strike a severe blow to its socio-economic stability. As a result, the State Government has decided to declare the state as “Natural Calamity Affected Area”.

Against this backdrop, the present study aims to systematically assess the impact of the August 2024 floods on agricultural livelihoods in Tripura. For detailed analysis, South Tripura District, one of the worst-affected regions, has been selected as the study area. By examining local coping strategies and identifying gaps in recovery measures, the study seeks to generate insights that can inform more effective policy formulation and program design at both the state and community levels.

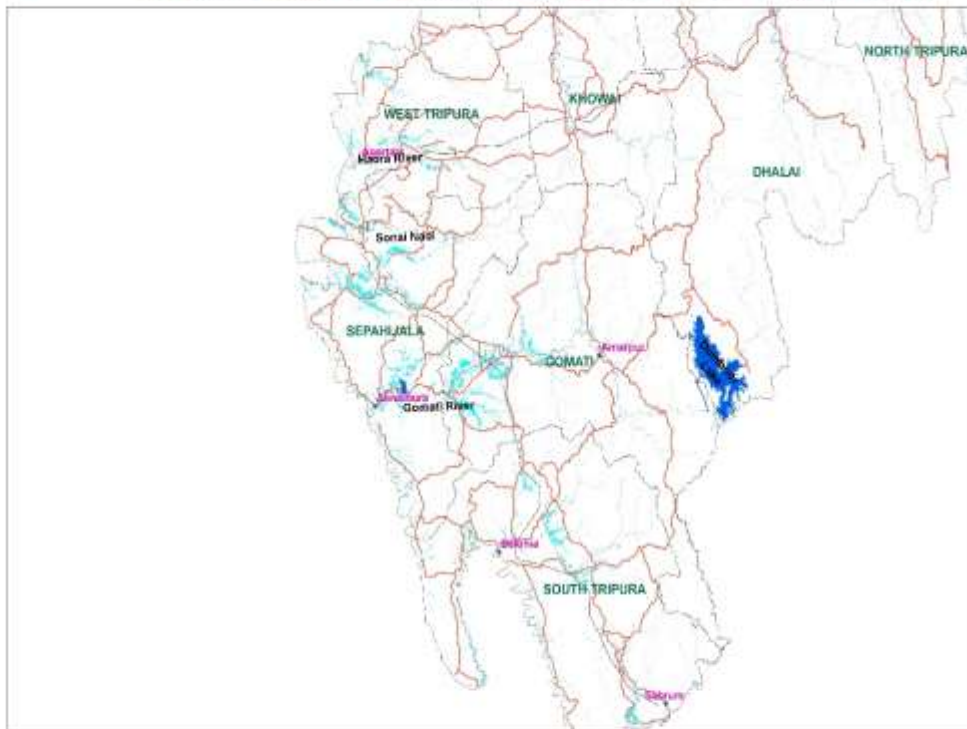
2. STATEMENT OF THE PROBLEMS

Floods and excessive rainfall are the most frequent natural disasters in Tripura, causing significant agricultural losses every year. Although the state has a relatively small geographical area, it is traversed by six major rivers. During periods of heavy rainfall, rivers such as the Haora, Gomati, Muhuri, and Manu often rise above the danger level, creating flood-prone conditions. The major consequences of these floods are borne by agriculture, with crop losses resulting from waterlogging, pest infestations, and soil erosion. Livestock are also severely affected, with floods leading to disease outbreaks and fatalities, further aggravating the hardships of farmers. Data compiled by the Central Water Commission (CWC) highlights that Tripura has experienced several devastating floods, with the events of 1993, 2015, and 2018 being particularly severe in terms of their impact on people, crops, and cattle. The 2018 flood was the worst in recent history, affecting 40,897 people, damaging 0.025 million hectares of crops, and causing the death of 3,905 cattle, with total damages reaching ₹946.18 crore—the highest recorded between 1953 and 2020. On average, according to CWC estimates, about 1.32 lakh people are affected annually by floods in Tripura, with agricultural losses alone averaging ₹12.30 crore, which accounts for nearly 28.8% of the total flood-related damages in the state.



Flood Inundation Areas in Parts of Tripura State

Based on the analysis of Sentinel-1A SAR Satellite Image of 21-08-2024 (1800 Hrs IST)



Map ID:
2024/FL/TR/01/21082024
Date of Issue: 22.08.2024

About the Event
Heavy rains are witnessed in Tripura and multiple rivers in Barak Basin were flowing above danger level. (Source: CWC, News Media)

Satellite Observations:
This map highlights the areas if there is flood inundation / Standing water just after the heavy rains.

Satellite Data Used
Pre Flood Data
Satellite RISAT-1A MRS SAR
Date of Pass: 20-05-2024
Post Flood Data
Satellite Sentinel-1A, SAR
Date of Pass: 21-08-2024

Reference Data Used
NRSC Landuse/Landcover SISDP Phase-II Data of 2024, Bhuvan Geospatial Legacy Data

Legend
Flood Inundation
River / Water body
Towns
District Boundary
Railway
Road

Disaster Management Support Group
Remote Sensing Applications Area
National Remote Sensing Centre, ISRO
Dept. of Space, Govt. of India
Hyderabad- 500 037
E-Mail: flood@nrsc.gov.in
www.nrsc.gov.in

Source: NRSC, 2024

The flood of August 2024 is considered as the most severe flood in the history of Tripura since 1953. This flood has caused severe damages to the agricultural sector of the state, particularly to rice and vegetable production. According to the final assessment conducted by the state government 2.66 lakh farmers were directly affected by this flood which resulted 2024 crore economic loss in agriculture and allied sectors Business Standard , 2024.

- (1) Agricultural damages: The agricultural sector was severely affected, suffering crop losses worth about ₹532 crore, of which horticulture alone accounted for ₹167 crore. Floodwaters inundated more than one lakh hectares of Aman paddy fields, while incessant rains triggered landslides that damaged nearly 4,000 hectares of jhum cultivation (Tripura Times, 2024; India Today NE, 2024). Overall, the agriculture sector suffered a loss of 1284 crore (Business Standard , 2024).
- (2) Livestock damages: The devastating floods of August 2024 caused extensive damage to the livestock sector, resulting in losses estimated at ₹23 crore. The disaster led to the death of 1,454 cows, 1,382 pigs and goats, and nearly 2,53,500 chickens. In addition, nine livestock infrastructures were damaged during the five-day flood. Around 10 tonnes of animal feed and 80 hectares of fodder land were also destroyed. To mitigate the crisis, 148 relief camps were set up, providing shelter and care for 8,581 cows (Tripura Chronicle , 2024).
- (3) Fisheries sector losses: A large number fish seed farms, hatcheries, and ponds were inundated, resulting in massive loss of fish stocks and severe damage to fisheries infrastructure. The fisheries sector alone incurred losses estimated at around ₹1,350 crore (India Today NE, 2024).

In this context, an attempt was made to study the impact of the 2024 Tripura flood on farmers' livelihoods in South Tripura District.

3. THE PRESENT STUDY

Tripura, being a predominantly rural and agrarian state, frequently experiences floods that have a profound impact on agricultural livelihoods. This study aims to explore how recurring floods influence the livelihood patterns of rural communities, especially those dependent on farming. Floods in the region often result in crop loss, land degradation, reduced income, and disruptions to food security.

The research investigates the ways in which affected households adjust their livelihoods—whether through



shifting to non-agricultural work, seasonal migration, or relying on local support networks. It also assesses the villagers' perspectives on the extent of flood-related damage and the effectiveness of institutional responses, including relief measures and recovery assistance.

Furthermore, the study evaluates the long-term sustainability of these coping strategies, given the increasing frequency of climate-related disasters. By capturing the local realities and challenges faced by flood-impacted communities in Tripura, this study aims to contribute to more informed disaster response planning and rural development policies.

4. BRIEF LITERATURE REVIEW ON THE IMPACT OF FLOODING ON AGRICULTURAL LIVELIHOODS

The impact of flooding on farmers' livelihoods has been widely examined in empirical studies across the globe. Balgah et al. (2023) carried out a comprehensive assessment of flood effects on agriculture-dependent livelihoods in three geo-ecological zones of Cameroon, drawing on data from 2,134 flood victims. Their findings indicate that floods cause severe losses to crops, livestock, infrastructure, and human health, with notable variations across regions. Both direct and indirect impacts on assets, human capital, and infrastructure were found to exacerbate poverty and heighten food insecurity. Israel et al. (2013) argued that flood and other natural disasters have insignificant effects on agriculture at the national level, they can cause significant local damage, especially to rice production and household food security. Lattana Soulibouth et al. (2021) found that farmers required 2–5 months to resume farming and livestock activities after the flood, indicating that recovery from its impacts was a prolonged process.

Some empirical works on the impacts of flood on livelihood of Indian farmers have also been conducted. Parida et.al (2021) mentioned flood as recurring phenomenon in India. The study reveals that flood damage positively influences rural agricultural wages in the long run by reducing labor supply due to out-migration to non-farm sectors. Ahmed and Rahman (2021) examined flood-induced agricultural losses in Assam's Lower Brahmaputra Valley, highlighting the vulnerability of small and marginal farmers. They found fisheries suffered the highest monetary loss ($\approx 50\%$), followed by paddy (24%), while livestock losses were minimal. In a recent study, Gunadal et al. (2024) reported that in Karnataka floods caused severe losses in sugarcane and maize, along with significant livestock deaths, injuries, and soil erosion that lowered productivity. Farmers suffered major income declines, yet the compensation provided was largely inadequate. Santhi et al. (2019) examined the 2018 Kerala flood's impact on farmers in Edathua Panchayat, revealing heavy losses in crops, livestock, and assets. Despite government relief, assistance was inadequate, leaving farmers in debt and struggling to recover. The study stresses timely support and sustainable measures to rebuild livelihoods. Studies on the impact of flooding on farmers' livelihoods and agriculture in Tripura are found to be very limited. Gope (2025) notes that recurrent floods of the Khowai River cause widespread crop loss, infrastructure damage, and community displacement in Tripura. Deforestation, soil erosion, and unplanned development have intensified these impacts, underscoring the need for sustainable flood management and cross-border cooperation. According to the Sphere India (2024), floods in Tripura inflicted severe damage on agriculture and farmers' livelihoods. Vast stretches of paddy and vegetable crops were submerged, resulting in significant yield losses and declining soil fertility. Farmers also lost livestock, stored produce, and essential inputs, while destruction of irrigation systems and rural infrastructure further deepened recovery challenges. The report highlights that small and marginal farmers bore the heaviest impact, facing debt burdens and food insecurity, and calls for timely compensation, rehabilitation measures, and promotion of climate-resilient farming practices.

5. OBJECTIVES OF THE STUDY

The primary objective of this study is to assess the overall impact of floods on the agricultural livelihoods of affected communities in Tripura, with a focus on the extent of farming losses, household coping strategies, and the post-flood recovery and rehabilitation needs.

Specific Objectives

In line with the primary objective, the study pursues the following specific objectives:

1. To examine the impact of floods on the agricultural livelihoods of the affected population.
2. To estimate the extent and magnitude of flood-induced damage in the farming sector.
3. To analyze the livelihood coping strategies adopted by flood-affected households.
4. To assess post-flood recovery processes, rehabilitation measures, and intervention needs for sustainable livelihood restoration.



6. RESEARCH METHODOLOGY

6.1 Study area: The study was conducted in Jolaibari RD Block of South Tripura District of Tripura. The study area was confined to four (4) Gram Panchayat (GPs) namely, Uttar Jolaibari GP, South Jolaibari GP, West Pilak GP & Mohuripur GP.

6.2 Sampling Procedure: A stratified random sampling technique was employed for selecting respondents. In the first stage, purposive sampling was used to identify the study area, and South Tripura District was chosen from among the flood-affected districts. In the second stage, Jolaibari RD Block was selected, as its crop areas experienced the highest level of damage in the district during the 2024 flood, making it suitable for assessing the overall impact on agricultural livelihoods. In the third stage, 105 respondents were randomly selected from flood-affected farming households.

6.3 Sample Size: The total sample size was initially set at 120, with 30 farmers selected from each village; however, following some refusals, the final sample size was reduced to 105.

6.4 Method of Data Collection: To fulfill the objectives of the study, both primary and secondary data were employed. Primary data were collected from flood-affected farmers through household surveys using pre-tested questionnaires, while secondary data were sourced from government records, newspapers, websites, and relevant literature including reports, books, and journals.

6.5 Data analysis: The data collected in this study were utilized to analyze the impact of flood damage on farmers' agricultural livelihoods, the magnitude of losses, and the coping strategies adopted by the affected farmers. Both qualitative and quantitative data were analyzed in line with the study's objectives. Quantitative data were tabulated and statistically examined using simple methods such as frequency and percentage, while additional statistical tools were applied to test the significance of the findings.

6.6 Reference period: The field survey was conducted in February 2025, approximately five months after the flood event of August 2024.

7. PROFILE OF THE STUDY AREA

Jolaibari R.D. Block, established in 2012, is located in South Tripura District, Tripura, and comprises 24 Gram Panchayats and Village Committees. The block spans a total geographical area of 223 sq. kilometres. Its economy is predominantly agrarian, with agriculture and allied activities—such as fisheries, animal husbandry, and forest-based livelihoods—contributing significantly to income and employment. More than 90 percent of farmers are small and marginal cultivators with limited land holdings.

The block is highly flood-prone due to the Muhuri River and its tributaries, which overflow during the monsoon. In 2024, nearly 3581 hectares (the largest flood-affected crop area in South Tripura District) were inundated, leading to heavy crop losses, soil erosion, and damage to livestock, farm infrastructure, and rural connectivity. Low-lying Gram Panchayats were the most severely affected, including those selected for the study area.

8. RESULT AND DISCUSSION

8.1 Demographic Profile of the Respondents Interviewed

The study was conducted among 105 respondents from four Gram Panchayats under Jolaibari RD Block of South Tripura District. Most respondents were male (97.14%), with 87.62% belonging to the 40–69 age group, and the mean age was 56.63 years. In terms of household composition, over half of the families were medium-sized (4–5 members, 54.29%), while smaller households (2–3 members, 35.24%) and larger ones were relatively fewer. Agriculture serves as the primary source of livelihood for 83.8% of respondents, and the sector is predominantly smallholder-based, with nearly 80% owning 1–5 kani of land. Notably, 84.76% of respondents are engaged in commercial farming, reflecting a strong orientation toward market-driven agricultural production.

8.2 Flood impact on farming sectors

It is estimated that in South Tripura District, a total of 20,571 hectares of crop area were affected by the flood, out of which 3,581 hectares were in Jolaibari RD Block.

(i) Flood impact on major crop production

The study reveals that floods severely affected both rice and vegetable cultivation in the study area. Approximately 79.05% of rice farmers, cultivating paddy fields of 1 to 5 kani, and 70.48% of vegetable



growers, with landholdings of less than 1 kani, were impacted, indicating that marginal farmers were the most affected. A notable proportion of farmers reported losses of less than ₹25,000—46.67% for rice and 74.29% for vegetables. Among rice farmers, 23.81% incurred losses between ₹26,000 and ₹50,000, 13.33% faced losses of ₹51,000 to ₹75,000, while 16.19% experienced higher losses exceeding ₹75,000.

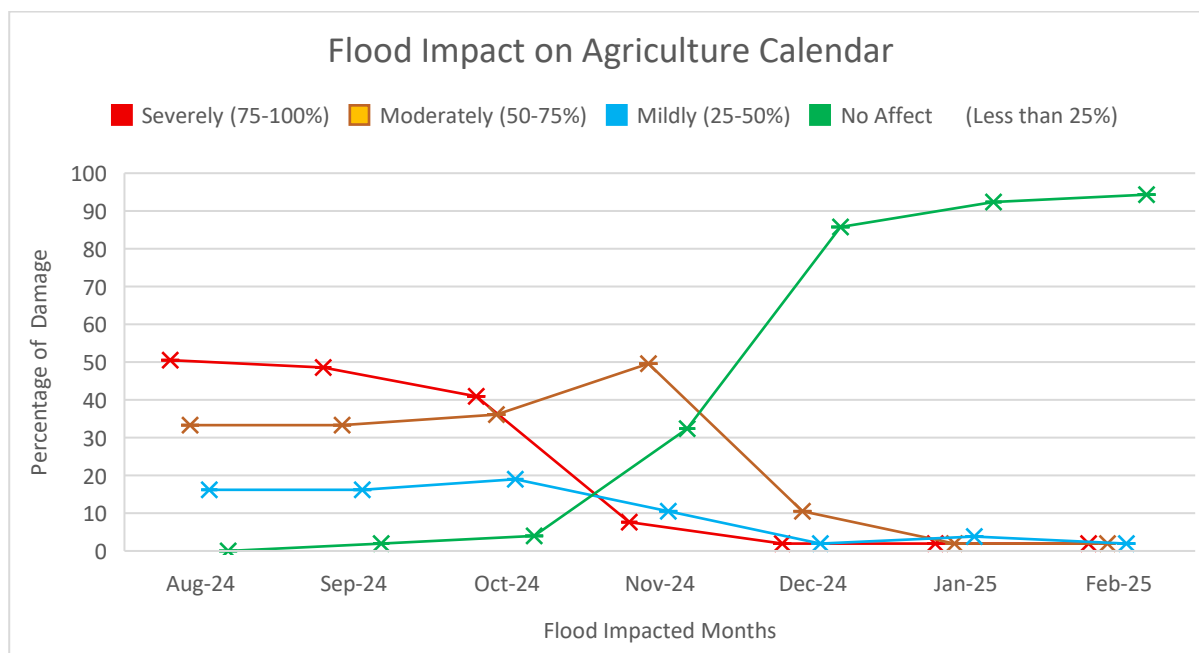
(ii) Flood impact on agricultural calendar

The analysis of the flood’s impact on the agricultural calendar highlights a prolonged disruption to farming activities, particularly during the initial four months following the event. The study categorizes the impact on farmers' cropland into four levels: Severe, Moderate, Mild, and No Effect. Croplands with damage ranging from 75% to complete loss are classified as severely affected. Damage between 50% and 75% is considered moderate, while damage between 25% and 50% is classified as mild. Croplands with less than 25% damage are designated as experiencing no effect.

In August 2025, when the flood impact was at its peak, 50.48% of respondents reported severe crop and schedule disruptions, 33.33% experienced moderate damage, and 16.19% reported only mild impacts. These findings underscore that the majority of farming households faced significant challenges in maintaining their agricultural practices during this period.

The severity of impact persisted into September, with 48.57% of respondents continuing to experience acute disruptions. By October, a large portion of farmers still reported severe difficulties, indicating that the agricultural cycle remained unsettled for an extended period beyond the flood month. Even in November 2025, 40.95% of farmers were still suffering severe impacts, demonstrating that the adjustment and recovery process was gradual rather than immediate.

A marked improvement was observed from December 2025 onward, as 85.71% of respondents reported resuming agricultural activities, signaling the start of recovery in farming calendars. By February 2026, nearly six months after the flood, 94.29% of respondents stated that they had returned to normal life and farming routines, though a small proportion (1.9%) continued to face serious challenges.



Source: Field Survey

This analysis makes it evident that the flood disrupted the agricultural calendar for approximately four months—between August and November 2025—while recovery trends became visible only from December onwards. The delayed restoration of farming activities reflects both the intensity of the natural disaster and the gradual pace of agricultural systems in returning to normal after severe climatic shocks.

(iii) Flood Impact on Crop Land

Among the 86% of respondents who reported that floods affected their soil, waterlogging was identified as the most common issue, affecting 49.40% of those impacted. This indicates that excess water retention significantly limits soil usability for crops. Salinity was the second most prevalent problem at 27.38%,



highlighting how floodwaters can cause chemical imbalances by depositing salts in the soil, which degrade its fertility. Erosion was reported by 18.45%, reflecting the physical loss of nutrient-rich topsoil due to floodwaters, while sediment deposition was the least reported issue at 4.76%, suggesting it has a smaller impact on the farming community. Overall, the data shows that floods primarily impair soil health through waterlogging and salinity, with erosion and sedimentation affecting a smaller portion of farmers. Although sedimentation accounts for a smaller proportion of flood impacts on crop land (4.76%), its effects can be far more persistent and long-lasting. During field visits conducted five months after the study, significant sedimentation impacts were still evident, with croplands covered by mud, garbage, sand, and other debris. This accumulation creates ongoing challenges for farmers, as the deposited layers of sediment can take months or even years to remove or naturally degrade.

(iv) Damages to Agricultural Facilities

The study revealed that floods not only damage natural resources such as soil and water but also disrupt vital agricultural inputs like seed storage and farming equipment, leading to long-term implications for productivity and recovery. Overall, 54.29% of respondents reported damages to agricultural facilities. All affected farmers reported losses in seed storage during the floods. In addition, significant damage was observed in agricultural equipment and infrastructure, with water pumps being the most affected (37.38%), followed by storage facilities (23.37%), tractors (18.69%), and irrigation systems (16.82%). These findings highlight the severe disruptions faced by farmers in maintaining essential inputs, which could critically hinder both agricultural performance and post-flood recovery.

8.3 Impact of floods on the agricultural allied sectors

Fisheries and livestock are the two most common and important allied sectors where farmers are involved for their livelihood. The impact of flood on these two sectors were also studied.

(1) Flood Impact on Livestock sector

The impact of floods on the livestock sector demonstrates considerable variation depending on the type of animal. According to the findings, cows (5.71%) and goats (6.67%) experienced minimal adverse effects, suggesting that these larger, more mobile animals are generally more resilient to flood events—likely due to their ability to be moved to higher ground or safer locations in a timely manner. However, poultry flocks exhibited a far higher vulnerability, with 46.67% of respondents suffering losses, underscoring the significant risks posed to this sector. Collectively, these results highlight the need for targeted interventions to protect poultry enterprises, which represent an essential livelihood and income source for many rural households, especially during and after flood events.

In terms of financial implications, most affected households faced relatively small-scale losses. A large majority (91.43%) reported damages below ₹25,000. Only a few households experienced higher levels of impact, with 1.90% each reporting losses between ₹26,000–50,000 and ₹76,000–1,00,000, while 4.76% suffered severe losses exceeding ₹1,00,000. Overall, the analysis suggests that although floods disrupted livestock-based livelihoods, the financial burden was modest for most households, with only a small proportion experiencing significant economic setbacks.

(2) Flood Impact on Fisheries

Floods had a catastrophic impact on fisheries, with 93.3% of farmers reporting damage and only about 4% remaining unaffected—primarily those without ponds. Among the affected farmers, losses were distributed almost equally, with 51% owning a single pond and 49% owning multiple ponds. This indicates that pond ownership is widespread among farming households in the study area and that the scale of ownership did not shield farmers from losses. Altogether, 140 ponds were damaged, covering approximately 133.7 Kani of pond area, highlighting the extensive destruction of aquaculture resources.

The financial toll was equally severe, with the total estimated loss amounting to ₹50.46 lakh. More than half of the farmers (53.06%) bore smaller losses of less than ₹50,000, while 30.61% suffered moderate losses ranging between ₹50,000 and ₹1,00,000. Alarmingly, 16.33% faced heavy losses exceeding ₹1,00,000, placing them under serious financial distress.

Overall, the findings underscore the high vulnerability of the fisheries sector to floods, where both small and large farmers face comparable risks and financial burdens.



8.4 Impact on Livelihood and Coping Strategies Adopted by Flood-affected Farmers

(1) Flood Impact on household income

The floods triggered far-reaching economic turmoil for households, deeply eroding their sources of income and pushing many families into financial insecurity. The analysis shows that nearly 90% of families endured moderate to severe losses. Among them, 39.05% reported income declines of 26–50%, reflecting the widespread disruption of daily livelihoods. A further 28.57% faced sharper setbacks, losing 51–75% of their earnings. Most concerning, 21.90% of households saw their incomes reduced by more than three-quarters, with some losing their livelihoods entirely. These findings highlight how quickly income streams can collapse during disasters, intensifying household vulnerability and underscoring the persistent threat that floods pose to community resilience and recovery.

(2) Livelihood Coping Strategies Adopted by the Farmers

To withstand the adverse impacts of floods, farmers adopted a range of coping strategies at the household level. The study revealed that 44.74% of households resorted to temporary migration as a means to meet their immediate financial needs. In addition, some families sought supplementary income through alternative activities, though such efforts were limited. A small fraction engaged in tuition (9.52%), daily wage labour (3.81%), or electrical work (1.9%), reflecting the narrow scope of livelihood diversification and the continued reliance on agriculture and allied sectors.

Rebuilding livelihoods after the flood also necessitated borrowing. Nearly half of the households (48.53%) borrowed from friends or relatives, followed by 38.24% who depended on moneylenders, and 8.82% who turned to SHGs or vendors. Only 4.41% accessed loans from formal banking institutions, underscoring a strong dependence on informal credit sources that often come with higher interest rates and greater financial risks.

The findings further highlight that households adopted multiple coping mechanisms simultaneously. Reducing household expenditures (35.38%) emerged as the most common strategy, followed by purchasing food on credit (24.10%), borrowing essential items (22.56%), borrowing food (9.23%), and sending family members elsewhere to eat (8.72%).

Overall, the evidence suggests that floods compelled households into short-term, often precarious coping behaviours—such as migration, cost-cutting, reliance on informal borrowing, and dependence on credit—thereby exposing them to further socio-economic vulnerabilities.

(3) Livelihood Resumption after Flood

Five months after the flood, when primary data was collected, the study revealed encouraging signs of recovery among farming households. A significant majority, 72.38% of respondents, had fully resumed their livelihoods, demonstrating resilience and strong recovery capacities despite the challenges faced. However, 23.81% reported only partial resumption, reflecting persistent constraints such as damaged land, loss of agricultural inputs, or inadequate infrastructure, which hindered full restoration of livelihood activities.

Notably, a small vulnerable section (3.81%) of households—had not been able to restart their livelihoods at all, placing them in a highly precarious position and underscoring their urgent need for targeted support and interventions.

Overall, these findings highlight a mixed pattern of post-disaster recovery. While the majority of farmers display adaptability and have been able to regain stability, nearly one-fourth remain in a transitional recovery phase, and a small but significant fraction continues to be fully reliant on external aid and short-term coping strategies.

8.5 Post-Flood Support Measures for Flood-Affected Farmers

(1) Post-Flood Recovery Needs

The study also explored the expectations of flood-affected farmers regarding external assistance. A majority (33.18%) emphasized the urgent need for early restoration of community infrastructure such as roads, culverts, and drainage facilities, highlighting the importance of connectivity and basic amenities in livelihood recovery. Nearly one-third of respondents (30.49%) called for direct financial aid to repair damaged assets and restart economic activities—especially critical for those burdened by loans or severe losses.

At the same time, 27.35% of farmers expressed interest in receiving training for alternative livelihoods, reflecting a forward-looking approach aimed at diversifying income sources and reducing vulnerability to



future shocks. A smaller proportion (8.97%) expected support in the form of agricultural tools and resources from government or community organizations to revive their farming practices.

Overall, the findings suggest that farmers' expectations extend beyond mere restoration to pre-flood conditions. Their priorities encompass rebuilding resilience through improved infrastructure, financial stability, and opportunities for livelihood diversification.

(2) External Supports received by the farmers to mitigate livelihood damages

To address large-scale flood-induced damages, government interventions are generally extended in the form of relief measures. However, in the study area, 57.3% of respondents reported that they had not received any government support to mitigate livelihood losses, particularly in agriculture, as of the time of the field survey. The remaining 42.7% acknowledged having received some form of assistance to restart their livelihood activities. Among those who benefitted, 39.4% accessed crop insurance claims, 28.2% received seed support from the Agriculture Department, and 14.1% were provided with agricultural tools and infrastructure to resume farming. Additionally, 18.3% of respondents received fingerlings from the Fisheries Department to rehabilitate their aquaculture activities.

Overall, the findings indicate that although crop insurance and seed distribution serve as the main sources of flood recovery, a significant share of affected farmers still remain outside the reach of formal support mechanisms.

(3) Preparedness for potential future flood

With regard to preparedness for potential future floods, encouraging feedback was received from the affected farmers. About 93.4% of respondents indicated their willingness to take measures to cope with similar situations in the future. Among their preparedness plans, 47.3% prioritized creating an emergency fund to address floods or other natural calamities, while the remaining 52.7% emphasized developing alternative sources of income as a safeguard against future vulnerabilities.

9. RECOMMENDATIONS

Based on the empirical findings of the study assessing the impact of the August 2024 floods on agricultural livelihoods, the following recommendations are put forward to strengthen disaster resilience and promote livelihood sustainability among rural farming communities:

- i. The Tripura Disaster Management Authority should encourage rural households to build small emergency savings and conduct regular community drills and preparedness training to improve readiness.
- ii. The Agriculture and Farmers Welfare Department should create a Farmers Relief Fund to provide timely and adequate financial aid to farmers for repairing damaged assets, replenishing inputs, and restarting agricultural and allied economic activities to reduce loan burdens and economic distress.
- iii. It is necessary to expand and improve crop insurance coverage and streamline claim processes to include a larger proportion of affected farmers for effective post-flood recovery.
- iv. The Animal Resource Development Department should facilitate targeted interventions for protecting vulnerable livestock sectors such as poultry through better shelter, vaccination, and emergency feed supplies.
- v. Need to develop community-managed flood shelters and raised storage depots for seed, fodder, and farming equipment.
- vi. There is a need to introduce and promote flood-tolerant and short-duration paddy and vegetable varieties in the flood prone areas to reduce crop loss.
- vii. To encourage the farmers for alternative source of income it is necessary to provide training and support for alternative income-generating activities based on their core competency.
- viii. Strengthening of Community Based Organisations (CBOs) such as Self-Help Groups (SHGs), Producers Groups (PGs), Farmer Producer Organizations (FPOs) etc for collective resilience and market linkages.
- ix. To ensure integrated flood response in Tripura it is necessary to enhance coordination between Agriculture, Fisheries, Animal Resource, and Revenue (Disaster Management) departments.
- x. The Agriculture and Farmers Welfare Department should encourage research collaborations with ICAR, universities, and other State level institutions to pilot innovative flood-mitigation practices.



10. CONCLUSION

The August 2024 floods in Tripura caused extensive and multifaceted damage to the farmers' livelihoods, impacting agricultural production, fisheries, and livestock. The floods also damaged individual and community infrastructures and left many households in financial crisis.

Although most farmers have shown adaptability by slowly getting back to their livelihood, a significant number are still relying on unplanned strategies to cope. Many are migrating, borrowing money, or reducing their consumption, which makes them more vulnerable to future shocks.

The study found that the current government supported relief efforts, such as crop insurance and limited input support, are inadequate and not reaching a large number of affected families. However, farmers have realised that saving money and diversifying their income sources are very much required for mitigating such future disasters, which highlights a potential way toward building long-term resilience.

In conclusion, the study emphasizes the critical need for a new policy approach that not only provides immediate relief but also includes long-term, sustainable strategies to protect farmers from recurrent flooding. These strategies should include climate-resilient agriculture, stronger institutions, convergence between departments, and support for livelihood diversification.

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