

# University of Barishal



Project Title: The impact of flood 2022 on Boro Rice

Md. Miraj Ahammed Diamond  
Computer Fundamental and Office Application  
01-044 -17  
Batch - 44

## **Abstract:**

Sunamganj district is a district surrounded by Hawar in Bangladesh. The flood of 2022 has caused massive human losses in this district. The present study discusses the impact of floods during paddy production and the quality of life and income of farmers in Sunamganj district. About 2 million people were affected by the 2022 floods, and the houses and houses of about 50 thousand people were destroyed, according to official estimates, the damage was more than 100 crore taka and the value of submerged paddy was about 13 crore Taka. Besides boro rice, almonds, fish, etc. were damaged during the floods. Through this study, the government will take necessary steps to protect Sunamganj from floods and take initiatives to protect crops as well as improve the quality of education.

## **Introduction:**

Sunamganj, nestled in the northeastern part of Bangladesh, has long been intertwined with the dynamic rhythms of its rivers and waterways. The annual monsoon, which brings both life-giving rains and destructive floods, holds the key to success or hardship for Boro rice farmers. As climate change continues to influence weather patterns, these floods have become increasingly unpredictable and severe, posing a multifaceted challenge to the livelihoods, traditions, and food security of the people of Sunamganj. The Sylhet division of Bangladesh receives relatively high rainfall, and rainfall from Cherrapunji in India flows down the Jadukata River and Surma River in Sunamganj, Bangladesh. Floods are created from this water. However, all flood records were surpassed by the 2022 flood, first in May, then in April, and then in June. Every district of Sylhet division, especially Sunamganj district was completely flooded, all the crops under the water were destroyed in this flood, and approximately 4 thousand 900 hectares of land were flooded in Sunamganj. Haor farmers have only one paddy growing season, during this season they grow boro paddy. Which fulfills the huge demand for food in Bangladesh. In the 2022 flood, about 90 percent of Boro rice was damaged. Most farmers could not harvest rice from the land, while experts said 2022 could see a food crisis in Bangladesh due to flood damage.

Sunamganj has 2,82,145 hectares of arable land and about 43.86% of the people of this district are dependent on agriculture. The haors of Sunamganj have a good yield of boro paddy due to which farmers cultivate boro paddy with interest every

year. But for the past few years, flash floods caused huge damage to Boro rice, our research shows that in 2021 flood yielded good rice but the 2022 flood had a major impact on Boro rice cultivation. Talking to the farmers, it is known that the 2022 floods caused extensive damage to the land and every crop was destroyed. People's incomes have fallen and many farmers have become destitute. The last flood in 2017 affected paddy, which farmers attributed to unplanned construction of dams and failure to take advance measures against floods.

To investigate the impact of the flood on the Boro rice production in Sunamganj district

### Literature review:

- Mondol, Akter, Hiya and Farukh (2019) study focuses on the extent of the loss of Boro rice and fish production in flash floods (2017) and how much impact it had on the livelihood of Haor residents.
- Shamsul Hoq, Kumar Raha and Ismail Hossain (2021) study was conducted to assess livelihood risks in flood-prone areas of Bangladesh. From this result, it was seen that the families of Sunamganj district were very vulnerable in terms of food, water, and health due to floods. This result is based on the framework of LVI and IPCC.
- Ripon Bagchi, Alim Miah, Papri Hazra, Robiul Hasan, Shekhar Mondal, and Sujana Kumar Paul (2020) This study investigates the impact of rainfall variability and flash flood management and water level in Tangra haor of Sunamganj district.
- Sahadat Hossain, Al Nayeem, and Kamruzzaman Majumder (2017) identified her study that due to flash flood (2017) aspects of damage to agricultural land how much land was submerged as a result of the flood, and finally how much crop was lost. It also helped families visualize the loss of crop production due to the impact of flooding.
- Mahir Tajwar found that by collecting data on flash floods and visiting the flood-affected areas, he drew a reasonable picture of their disaster. He has shown how sudden floods occur in Tahirpur Upazila of Sunamganj district of Bangladesh due to water coming from India.

- Mriganka Dolui studied Udaynarayanpur a flood-prone area in CD block how it affects the socio-economic life of people and analyzed the problem of this flood situation, and its impact.
- Altaf Hossain, Fahmida Ishaque, Hafizur Rahman, Tamiz Uddin, Rashid Sarkar, Joyshankar Baida, and Jahan Ripa (2020) described in Boro of Sunamganj district have implemented management measures to avoid the impact of flash floods on paddy production. and evaluated meteorological parameters with global climate data in this study three main climate parameters (precipitation, temperature, and cloud fraction have been considered. and the said climate data was analyzed using EDGCM.
- Haque, Moniruzzaman, Hossain, and Alam (2022) analyzed in Climate change risk and flash flooding of Haor indigenous farming systems of Sunamganj district. A comparative analysis of climate risks in different agricultural sectors such as crop protection, community protection, fisheries, and climate change vulnerability and adaptation capacity was done.
- Kamruzzaman and Shaw (2018) identified detailed agricultural practices and crop types in the Haor region and showed the cause of Boro paddy loss due to the Haor floods. They mention the characteristics of floods and the impact of floods on agricultural production.

## Method:

### Geographic area and location:

Sunamganj District is an administrative region of Sylhet Division in northeastern Bangladesh, Meghalaya in India to the north, and Sylhet District to the east. This district is located on the banks of the Surma River. The latitude and longitude of the location of the city is 25.065948°N 91.407694°E. The average height of the city above sea level is 10 meters. The area of this district is 3747.18 square kilometers. Population 2695495 (Census 2022). This district has 12 Upazila, 88 unions and 2887 villages. Annual rainfall is 3334 mm. The annual average temperature is a maximum of 33.2 Celsius and, a minimum of 13.6 Celsius. Total

land is 3,74,718 hectares. Cultivated land is 2,82,145 hectares. And there are 2,94,109 agricultural families. About 43.86% of people in this district are dependent on agriculture (Source: Sunamganj.gov.bd).

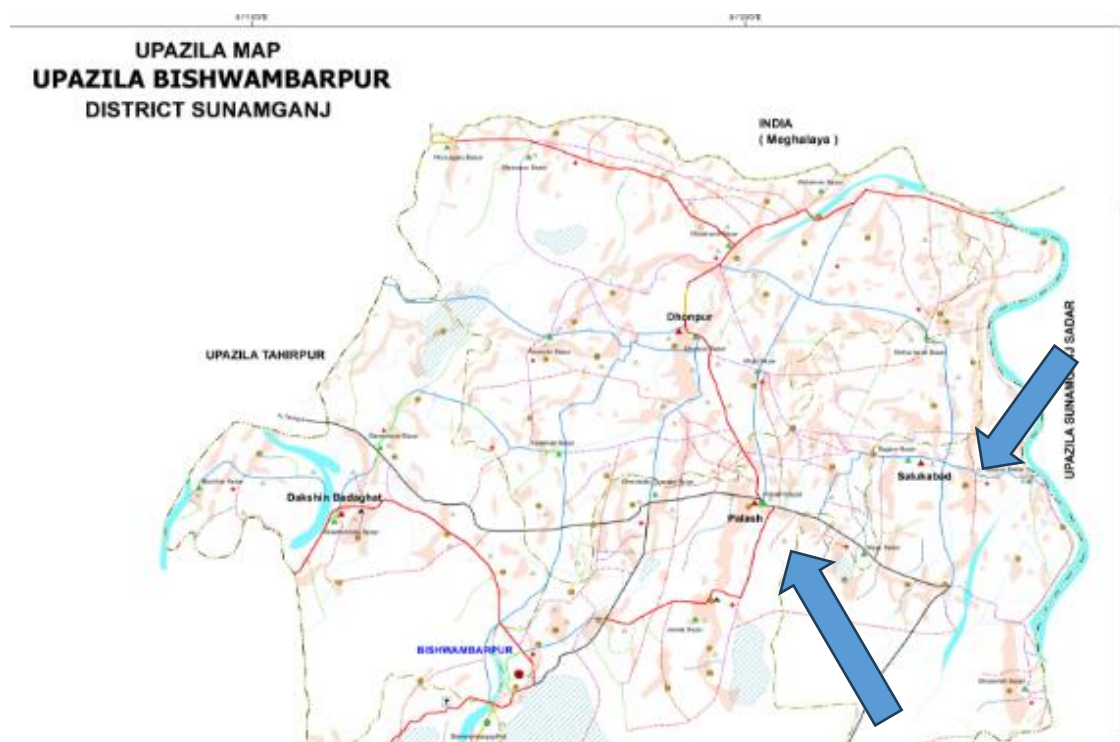


Figure: Map of the Biswambarpur Upazila

This research has been done mainly on Palash Union and Solukabad Union of Bishwambarpur Upazila of Sunamganj District. Bishwambarpur upazila is located in the north of India's Meghalaya hills, in the south of Jamalganj upazila, and in the west of Tahirpur upazila. Its area is 246 square kilometers. There are 5 unions in this upazila. Out of which the area of Palash Union is 45 square kilometers and the population is around 38,640. Then the area of Solukabad Union is 45 square kilometers. There are 31 villages and a population of 37,375. In this union, the amount of cultivated land is 3000 hectares, and the amount of uncultivated land is 100 hectares. It is also known that the amount of one crop land is 2150 hectares the amount of two crop lands is 350 hectares, and the amount of three crop lands is 450 hectares.

**Site selection:** Two unions of Bishambarpur upazila were selected for the study. The Unions are the Palash Union and Solukabad Union. Information is collected from the farmers of flood-affected villages.

**Data collection:**

The study data were collected through field visits in the flood-affected area from 1-8 June 2023. The data were also collected from the farmers, union parishad member, leaders of the farmer's community, and journals and reports.

### **Rice production:**

Boro rice cultivation in the haor areas of Palash Union and Solukabad Union was severely affected due to the devastating flood event. As the early flood destroyed rice production most of the farmers were affected severely. According to the information of the farmers, the flood of June 2022 caused a massive collapse in paddy cultivation. Most of the farmers could not collect paddy from the land. As a result of the floods, they were very stressed about their living conditions while other crops including paddy were said to have suffered heavy losses.

### **Data analysis:**

Collected data were checked for accuracy and clarity after each visit in the study areas. After collection of all relevant data, these were compiled, processed and analyzed. MS Excel and MS Word were used for processing and analyses the data.

## **Results and discussion:**

### **1. Education qualification**

From Figure 1 it can be seen that Bishwambharpur Upazila of Sunamganj, Solukabad Union, and Palash Union have illiterate farmers (6 %), and the majority are educated up to HSC 1st year (19 %) and after primary education continue to secondary education total (25 %). Whereas in Class 6 and 7 -(19%), in Class 8 and 9 (6%), and having attained primary education (18%) while in Class 2 and 3 - (6%), and Class 4 and 5 - (12 %).

According to the information, most of the farmers are poorly educated and very backward in literacy rate.

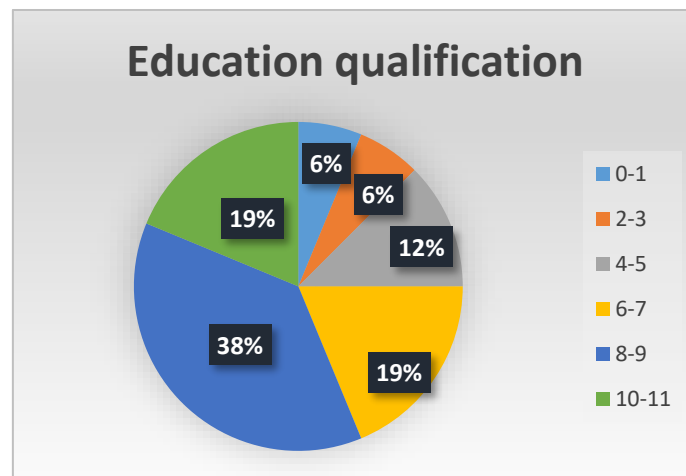


Figure 1: Education qualification

Source: Field work, 2023.

According to the information, most of the farmers are poorly educated and very backward in literacy rate.

## 2. Family members:

This study shows that each agricultural family has 3 to 5 members, 56.25% which is the least in terms of family members, and the maximum number of family members is 6.25%. Then the second highest number is 9-11 which is 6.25% and 6-8 is 31.25% which is always considered an increased membership.

Table 1: Family members

Range	Frequency	Percentage
3-5	9	56.25
6-8	5	31.25
9-11	1	6.25
12-14	1	6.25
Total	16	100

Source: Field work 2023.

Then the second highest number is 9-11 which is 6.25% and 6-8 is 31.25% which is always considered an increased membership.

### 3. Years involved in agriculture:

The provided data represents a distribution of values across different ranges, along with their respective percentages. These ranges are divided into four categories: "3-12," "13-22," "23-32," and "33-42." The percentages indicate the years involved in paddy cultivation in each range.

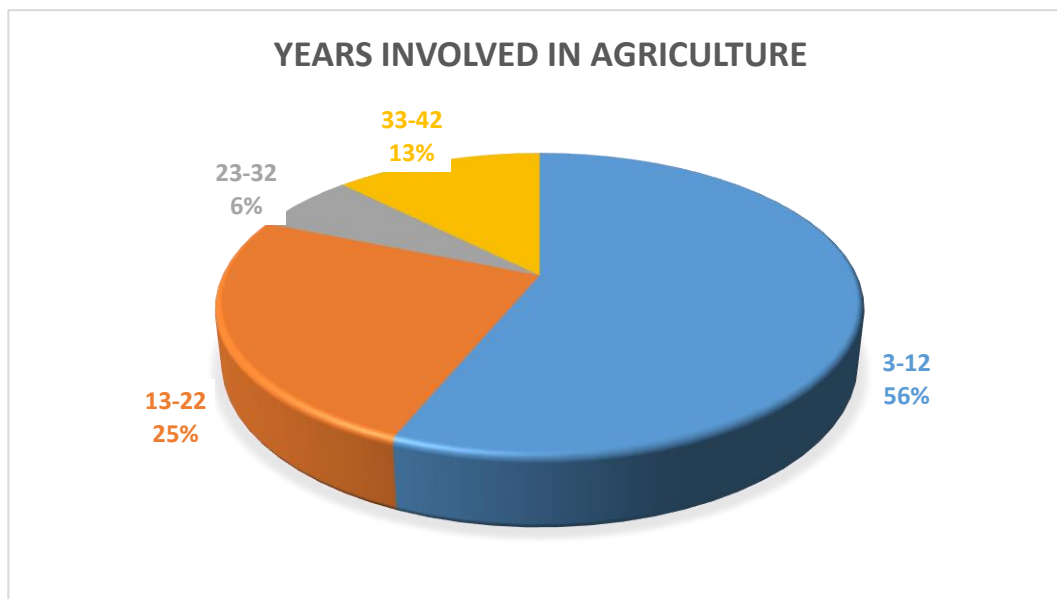


Figure 2: Years involved in agriculture

Source: Field work 2023.

the majority of the data (56.25%) falls within the range "3-12" years, followed by a smaller percentage (25%) in the years "13-22". Then "23-32" and "33-42" account for even smaller proportions, with 6.25% and 12.5%, respectively.

### 4. Land cultivated:

Those who own agricultural land in haor earn more only from paddy cultivation. The production of paddy is high in Haor at a relatively low cost. This study shows that 37.5% of the "1-3" bigha land produces rice. And secondly, the amount of land held by farmers is "4-6" Bigha 37.5%.



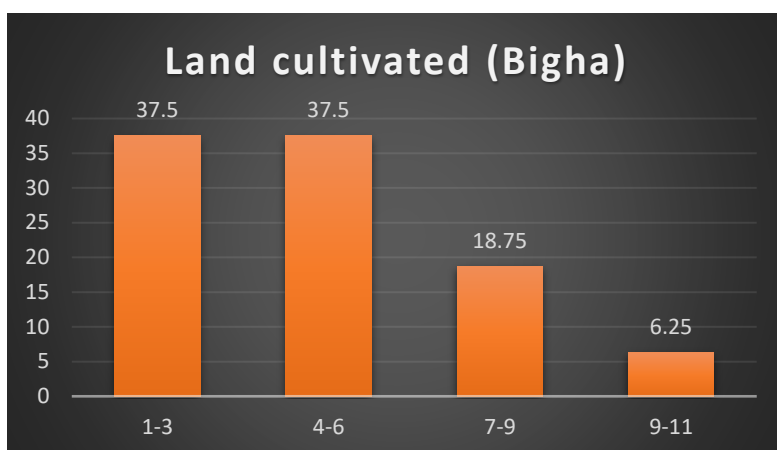


Figure 3: Land cultivated in paddy production

Source: Field work 2023.

Here it can be seen that "1-3" Bigha and "4-6" Bigha are equal in number of cultivators. Then "7-9" bigha land cultivate 18.75%. Only 6.25% of the last "9-11" bigha land is cultivated.

## 5. Seed need to cultivation:

Farmers use rice seeds to produce their rice crops, many grow the seeds themselves and many collect them from the market. The mentioned figure shows that 14-22 Kg seeds use 43.75% which is the maximum amount. Again, the lowest two ranges are 23-31 kg and 32-40 kg with a percentage of 0%. Then 6.25% of seeds use 41-49 Kg. The highest quantity of seed used is 50-58 Kg which comprises 18.75%. And the least seed consumption is 5-13 kg which is 31.25 % of the total amount.

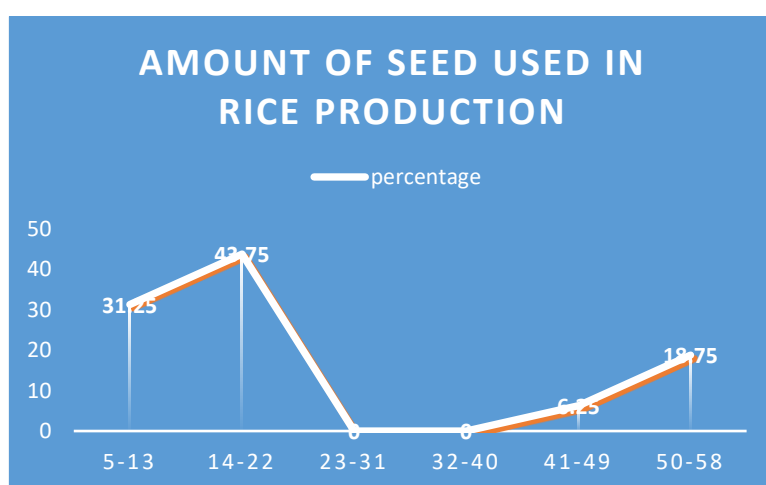


Figure 4: Seed used in rice production.

*Source: Field work 2023.*

Here it is seen that those who have less quantity sow seeds accordingly. On average, 5-6 kg of boro rice seeds are used in 1 bigha of land.

## **6. Rice production without flooding:**

According to the study, relatively good paddy is produced in Haor land and many produce paddy at low cost. The rice demand of Bangladesh is met by the production of other rice including Boro rice produced in Hawar. Talking to the farmers, it is known that Boro paddy production is 840 kg to 1000 kg in 1 bigha land (without floods).

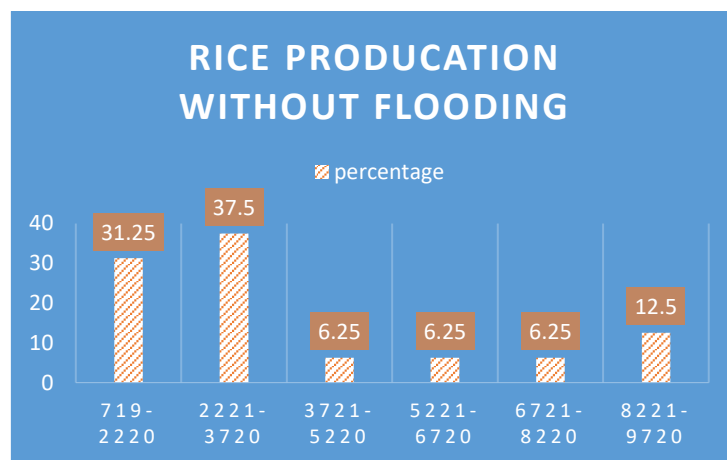


Figure 5: Rice production without flood

*Source: Field work 2023.*

In figure 5, farmers of Solukabad Union and Polash Union of Bishwambharpur Upazila of Sunamganj produce (719-2220 KG) which is 31.25%. And 37.5% produce paddy within the range (2221-3720 kg) which is the maximum amount. Then 6.25% of rice production is in three ranges which are (3721-5220 Kg), (5221-6720 kg) and (6721-8220 kg). 12.5% of paddy production falls within the latter (8221-9720 kg) range.

## **7. Yearly income from rice cultivation without floods**

This figure shows the annual income of farmers from rice cultivation. The income of the farmer who produces more rice is comparatively higher while

the income of the farmer who produces less rice is less.

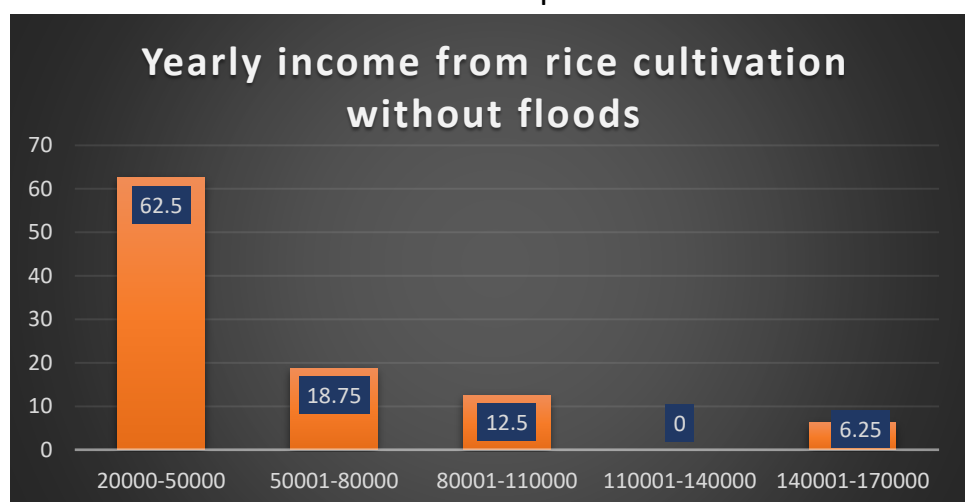


Figure: Yearly income from rice cultivation without floods.

Source: Field work, 2023.

Here the income is considered according to the market price of paddy. It is seen that 20000-50000 Tk is 62.5% of farmers' income. Secondly, 18.5% which is within Rs 50001-80000. (110001-140000) taka is 0 percent income. Then there is 17.5% within the range of Rs. 6.25% within the latest range of Rs 140001-170000.

## 8. Income from other occupation:

Many farmers are engaged in other occupations besides paddy cultivation. According to the information of many farmers, they cannot make a living by cultivating paddy alone, so they engage in other occupations and earn income along with meeting the needs of the family. The above figure shows that 25% earn between 4999-25000 (Tk) from other professions. Then 50% earn within 25001-45000 (Tk) Range. Then 6.25% of total income is 45001-65000 (Tk). Then 65001-85000 (Tk) are within 12.5% of total income. And within the range (85001-105000) the income is 0. Latest (105001-125000) Tk 6.25%.

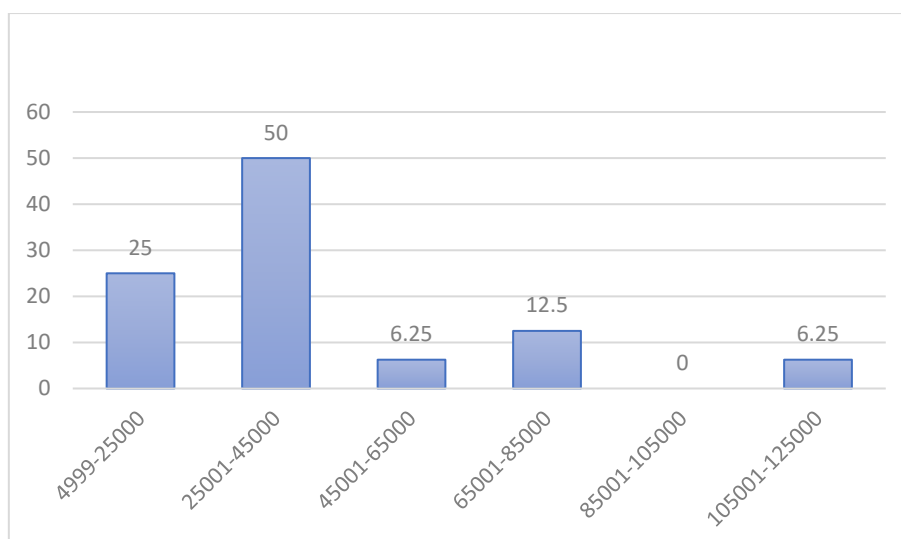


Figure: Farmers income from other occupation

Source: Field work 2023.

According to the information of the farmers, here every farmer tries to earn by doing what he likes. Those who have less cultivated land earn their livelihood from other occupations.

## 9. 2022 flood damage to Rice crop:

The 2022 floods caused huge damage to farmers' paddy crops. According to the information of the farmers, in 2022, those who have more land cultivated in Howar suffered more losses, they could not bring home the ripe boro rice.

Table-2: Flood damage to rice crop

Range (Tk)	Frequency	Percentage
4999-55000	10	62.5
55001-105000	3	18.75
105001-155000	1	6.25
155001-205000	2	12.5
Total	16	100

Source: Field work 2023.

At that time, the financial loss information of some farmers was collected. The said data shows that the loss was 4999-55000 tk are 62.5%. 55001-105000 (Tk) is within this 18.75%, 105001-155000 Tk loss is 6.25% and last Tk 155001-205000 loss is 12.5%.

## 10. Crop conditions in floods.

Farmers were asked about the status of paddy cultivation in the 2022 flood. In this figure, it can be seen that about 69% of the people have suffered total loss by cultivating paddy. And only 12% suffered losses.

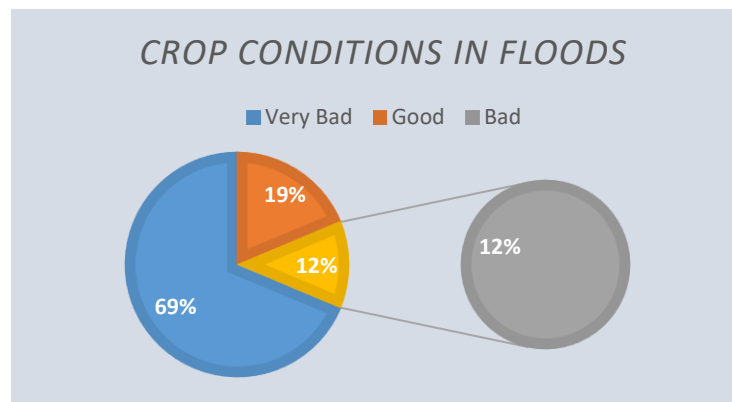


Figure: Crop conditions in floods 2022.

Source: Field work 2023.

Then 19% say fairly well. Those who could not collect crops from the land are 69% while the farmers who managed to collect some crops from the land are at 19%.

### Conclusion:

Farmers of Sunamganj will have a long time to recover from the 2022 floods. These flash floods have caused a lot of damage to crops along with quality of life. And wealth and income have changed drastically. In this research, it can be seen that the farmers of Bishwambharpur Upazila and our study area Palash Union and Solukabad Union are relatively less educated and depend on agriculture. Every year the people of the low-lying areas suffer huge losses due to small and large floods. Their main source of income is agriculture. But every year their income, wealth, and quality of life deteriorate due to crop loss. In 2022, the flood affected every family in Sunamganj, the lower middle-class families have not recovered yet. In this way every year they are interested in joining other professions besides agriculture.

## Reference

- OAbedin, J., & Khatun, H. (2019). Impacts of flash flood on livelihood and adaptation strategies of the haor inhabitants: A study in Tanguar haor of sunamganj, Bangladesh. *The Dhaka University Journal of Earth and Environmental Sciences*, 8(1), 41-51.
- Hoq, M. S., Raha, S. K., & Hossain, M. I. (2021). Livelihood vulnerability to flood hazard: Understanding from the flood-prone Haor Ecosystem of Bangladesh. *Environmental management*, 67, 532-552.
- Bagchi, R., Miah, M. A., Hazra, P., Hasan, R., Mondal, H. S., & Paul, S. K. (2020). Exploring the effect of rainfall variability and water extent in Tanguar haor, Sunamganj. *Aust. J. Eng. Innov. Technol*, 2(4), 66-76.
- Hossain, M. S., Nayeem, A. A., & Majumder, A. K. (2017). Impact of flash flood on agriculture land in Tanguar Haor Basin. *International Journal of Research in Environmental Science*, 3(4), 42-45.
- Tajwar, K. M., & Islam, S. T. Causes and Consequences of Flash Flood in the North-Eastern Part of Bangladesh: A Case Study on Tahirpur Upazila of Sunamganj District.
- Dolui, M. CHALLENGES AND CONSEQUENCES OF FLOOD IN RURAL AREAS: A GEOGRAPHICAL STUDY OF POST-FLOOD SITUATION OF UDAYNARAYANPUR CD BLOCK OF HAORA DISTRICT, WEST BENGAL.
- Hossain, M. A., Ishaque, F., RAHMAN, M. H., Uddin, G. T., Sarker, M. A. R., Baidya, J., & Ripa, I. J. (2020). Flash flood management approach for flood risk areas using numerical climate modeling data analysis.
- Haque, M. A., Moniruzzaman, S. M., Hossain, M. F., & Alam, M. A. (2022). Assessment of climate change risks and adaptation of improved farming practices in dekhar haor of sunamganj district. *Bangladesh Journal of Agriculture*, 47(1), 39-65.
- Kamruzzaman, M., & Shaw, R. (2018). Flood and sustainable agriculture in the Haor basin of Bangladesh: A review paper. *Universal Journal of Agricultural Research*, 6(1), 40-49.