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The Impact of Flood Disaster on Agriculture in Tajau Landung Village

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Abstract

The floods that hit Tajau Landung Village have had a significant impact on agricultural land and the lifestyle of the community, especially farmers who have experienced a decrease in income. The agricultural sector, with paddy rice cultivation as the main commodity, has a central role in the national economy and food security. Frequent flooding in the village poses a serious threat to farmers' livelihoods and local food security. The geographical condition of the village, which is located in a tidal lebak swamp area, makes agricultural land very vulnerable to inundation, especially during the rainy season. This research was conducted to gain in-depth knowledge on how this disaster affects agricultural productivity and the lives of farmers. This study used a qualitative method using interviews, observation and documentation. Data analysis was processed through presenting a comprehensive picture of the contribution of farmer groups in building food security and agricultural recovery efforts after the flood. The results show that annual flooding causes sub-optimal harvests, pest infestations such as rats and golden snails due to waterlogging, and increased acid content in the soil that interferes with rice growth. These direct impacts cause material losses to farmers, with average incomes declining by 50% during major floods. Overall, the high frequency of flooding not only damages crops and land, but also significantly threatens agricultural production and community food security in Tajau Landung Village.

Keywords: Food Security, Impact, Agriculture, Flooding

Abstrak

Banjir yang melanda Desa Tajau Landung telah berdampak signifikan pada lahan pertanian dan gaya hidup masyarakat, terutama para petani yang mengalami penurunan pendapatan. Sektor pertanian, dengan budidaya padi sawah sebagai komoditas utama, memiliki peran sentral dalam perekonomian dan ketahanan pangan nasional. Bencana banjir yang sering melanda desa tersebut menjadi ancaman serius terhadap mata pencaharian petani dan ketahanan pangan lokal. Kondisi geografis desa yang berada di area rawa lebak pasang surut membuat lahan pertanian sangat rentan terhadap genangan air, terutama pada musim hujan. Penelitian ini dilakukan guna menambah ilmu mendalam tentang bagaimana bencana ini memengaruhi produktivitas pertanian dan kehidupan para petani. Studi ini menggunakan metode kualitatif dengan menggunkan wawancara, observasi dan dokumentasi. Analisis data diproses melalui menyajikan gambaran komprehensif mengenai kontribusi kelompok tani dalam membangun ketahanan pangan dan upaya pemulihan pertanian pascabanjir. Hasilnya menunjukkan bahwa banjir tahunan menyebabkan panen kurang optimal, gangguan hama seperti tikus dan keong

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emas akibat genangan air, dan peningkatan kandungan asam dalam tanah yang mengganggu pertumbuhan padi. Dampak langsung ini menyebabkan kerugian materiil bagi petani, dengan rata-rata pendapatan menurun hingga 50% saat banjir besar. Secara keseluruhan, frekuensi banjir yang tinggi tidak hanya merusak tanaman dan lahan, tetapi juga secara signifikan mengancam produksi pertanian dan ketahanan pangan masyarakat di Desa Tajau Landung.
Kata Kunci: *Banjir, Ketahanan Pangan, Dampak, Pertanian*

Preliminary

The agricultural sector has a central role in the national economy and food security, especially with the cultivation of paddy rice as the main commodity. In areas such as Tajau Landung Village, Banjar District, South Kalimantan, agriculture is the livelihood of the majority of the population (Rahmaniah et al., 2025). However, this vital sector faces serious threats in the form of frequent floods, which directly threaten the sustainability of farmers' livelihoods and local food security. The geographical condition of the village, which is located in a tidal lebak swamp area, makes agricultural land very vulnerable to waterlogging, especially during the rainy season (Jawang et al., 2022).

The floods that hit Tajau Landung Village have caused significant impacts on the agricultural land and lifestyle of the community, especially the farmers who have experienced a decrease in income (Rahmia, 2025). The floods that occur every year in Tajau Landung Village have a significant impact on people's lives and the agricultural sector. Heavy rainfall and river overflows cause flooding that damages agricultural land and threatens local food security. BPS data explains that the frequency of flooding in this village has increased, with more than 60% of agricultural land submerged in water during the rainy season. This shows that flooding has become an ongoing challenge (Hapsah, n.d.).

The economic impact of flooding on farmers is devastating. Crop failure due to prolonged submergence of crops leads to great income uncertainty. The financial losses suffered by farmers are significant, and this is exacerbated by the decline in grain selling prices after the floods (Khadijah et al., n.d.). Production instability due to flooding also impacts food supply and market price dynamics, which in turn can increase farmers' vulnerability to poverty and economic hardship (Kusumaningrum, 2019).

The impact of flooding on agriculture in Tajau Landung Village is very pronounced, especially on rice cultivation. Based on BPS data, around 30% of agricultural land in the village is regularly flooded, resulting in a significant decrease in rice production and even crop failure. This crop failure has a direct impact on farmers' income. The average income of rice farmers can decrease by up to 50% during major floods (Sari et al., 2025). In addition, village infrastructure such as roads and irrigation channels are also damaged by flooding, which makes

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it difficult for farmers to access their land and hinders the distribution of agricultural produce to markets (Mutiani et al., 2025).

In addition to direct crop losses, flooding also triggers other problems such as increased pest populations. The waterlogged conditions caused by flooding create a suitable environment for pests such as rats and golden snails to reproduce well (Ilhami & Handy, 2025). These pests damage crops and yields, adding to losses for farmers. This increase in pest populations is an ongoing problem that is difficult to control with conventional methods (Syaharuddin et al., 2025).

Prolonged flooding also changes the soil composition in Tajau Landung Village. The swampy land in the village has become increasingly acidic due to the decomposition of waterlogged crop residues. Research shows that prolonged inundation can increase the concentration of organic acids, which causes soil pH to decrease and disrupts the balance of nutrients needed by plants (Yuliyanti et al., n.d.). These overly acidic soil conditions can inhibit the uptake of essential nutrients and increase toxic elements, which are detrimental to rice growth (Handy et al., 2025). This study can make a significant contribution to the knowledge of flood disaster risk for agriculture in tajua landung village. food security and agricultural sustainability in disaster-prone areas.

These changes indicate the need for more adaptive and sustainable agricultural management approaches in flood-prone areas. Adaptation may include the selection of rice varieties that are more tolerant to inundation, the implementation of more effective irrigation and drainage systems, and the development of cultivation techniques that are able to minimize the adverse impacts of water flutuations (Rahman, 2022). Structural mitigation efforts, such as embankment construction and normalization of waterways, are also crucial to reduce the frequency and intensity of flooding. Thus, the integration of adaptation and reduction will be the key to strengthening food granaries and the sustainability of farmers' livelihoods in the future (Asminar, 2020).

Efforts to increase farmers' capacity and knowledge are also very important in dealing with the impact of flooding in Tajau Landung Village. Training related to adaptive cultivation techniques and disaster risk-based land management can empower farmers to be more prepared and resilient in dealing with changing environmental conditions. Support from the government and related institutions in the form of counseling, agricultural infrastructure assistance, and adequate capital are key factors in strengthening the social and economic resilience of local farmers (Yogar, 2021).

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The role of the community in planning and implementing disaster mitigation is a crucial aspect so that the strategies implemented are effective and sustainable. The Tajau Landung Village community, which has local knowledge of flood patterns and natural conditions, can actively contribute to the preparation of adaptation and mitigation measures. Cross-sector collaboration, such as between local government, academics and farmer groups, can produce innovative solutions that suit the characteristics of tidal swamp areas (Abim et al., 2020)

Method

Researchers used qualitative methods to understand the impact of flooding on the agricultural sector in Tajau Landung Village. This approach was chosen because it was able to explore an in-depth understanding of the experiences of farmers and farmer groups in dealing with disasters. The main focus was on the interactions and strategies they implemented to overcome the negative impacts of flooding on productivity and land conditions. In collecting data, researchers used in-depth interviews with farmer group members and village officials, as well as direct observation and documentation in the field. Data analysis was conducted through a process of data collection, reduction and presentation. The aim is to present a comprehensive picture of the contribution of farmer groups in building food security and agricultural recovery efforts after floods (Sugiyono, 2017).

Results and Discussion

Floods that occur in Tajau Landung Village every year have a significant impact on people's lives and the agricultural sector. Heavy rainfall and river overflows cause flooding that damages agricultural land, threatening local food security. According to BPS the frequency of flooding in the village is increasing, with more than 60% of agricultural land under water in the rainy season. This shows that the problem of flooding is not just episodic, but an ongoing challenge for the community (Rosyadi et al., 2022).

Adaptation is a crucial aspect in the sustainability of the agricultural sector, especially in areas vulnerable to natural disasters. Adaptive capacity, defined as the ability to adjust to changes and stresses through modification of behavior or strategies, becomes highly relevant in this context similar (Hairani & Raihana, 2017). In Tajau Landung Village, the agricultural sector, particularly rice cultivation, is heavily impacted by the frequency and intensity of flooding. Data from the Central Bureau of Statistics (BPS) indicates that around 30% of agricultural land in the village is regularly flooded, resulting in significant reductions in rice production and crop failure. Therefore, increasing the adaptive capacity of farmers in Tajau Landung Village through the implementation of strategies and behavior modification is essential to mitigate the negative impacts of flooding and maintain food security and local economic sustainability (Walker & Salt, 2012).

Crop failure due to flooding has a direct impact on the income of local farmers. The average income of rice farmers in Tajau Landung Village can decrease by up to 50% when a major flood occurs. The adverse impact of flooding is also felt by communities outside the agricultural sector. Many houses and village infrastructure were submerged, which added to the economic burden on the community. Due to river overflows, many families lost their homes and were forced to evacuate to safer locations. This affected the mental health of the community, who felt insecure and worried about their future (Lestari, 2021).

Other adaptation approaches include livelihood diversification and optimal land utilization. Some farmers, for example, started to cultivate fish in their rice fields (minapadi system) or developed side businesses outside the agricultural sector, such as trading or raising

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livestock. These efforts aim to reduce dependence on just one commodity, so that in the event of a rice harvest failure, other sources of income can serve as an economic buffer. Utilization of flooded land for the cultivation of other more water-tolerant commodities, such as swamp crops or floating vegetables, is also an alternative being explored to maximize yields from land threatened by flooding (Marzuki, 2023).

Weather uncertainty due to climate change exacerbates the flooding situation in the village. Many farmers complain about the irregularity of the planting season, which makes it difficult for them to decide when to plant. According to data from BMKG, the La Nina phenomenon in recent years has caused an increase in the frequency of rainfall. This is reinforced by Harahap's study noting that extreme rainfall is a major contributing factor to flooding (Harahap et al., 2023)

The drastically reduced income of farmers due to flooding affects not only individual well-being, but also the socio-economic resilience of the community as a whole. The decline in income leads to limitations in fulfilling basic needs such as food, education and health. In addition, the increased economic burden due to infrastructure damage hinders post-flood recovery and can slow down the long-term economic growth of the village. Support from the government and related agencies in the form of financial assistance and rehabilitation programs is needed to help communities recover and reduce their vulnerability to subsequent disasters.

The livelihood diversification that farmers in Tajau Landung Village have begun to implement is an adaptation measure that shows great potential in dealing with flood disaster risks. Diversification strategies such as the development of mina padi systems or the management of flood-tolerant crops not only strengthen the local economy, but also encourage innovation and environmental sustainability. Business diversification creates a wider network of economic security, allowing communities to be more resilient in the face of climate uncertainty. The utilization of natural resources and local wisdom in this business model can also serve as an example for other villages facing similar problems.

Weather uncertainty due to climate change underscores the importance of developing early warning systems and increasing community capacity in disaster mitigation. Data from BMKG and related studies show that extreme weather phenomena such as La Nina will continue to affect rainfall patterns and flood frequency. In this context, the implementation of precision agriculture technology and cropping systems that are adaptive to seasonal changes is crucial. Guidance to farmers on disaster risk management and climate change-based agricultural business planning needs to be strengthened to reduce losses and maintain agricultural productivity in the future.

Economic losses also extend to broader sectors, such as rice trading and marketing. Many traders were unable to sell their agricultural products because the flooding hampered the harvesting process. The village economy was also disrupted by recurrent flooding. With declining agricultural yields, food supplies in the market were reduced, causing food prices to rise sharply. According to BPS data, food inflation in Tajau Landung Village increased by up to 20% during the flood season. Village infrastructure also suffered flood damage, including roads and irrigation channels. Damaged roads make it difficult for farmers to access their land and hamper the distribution of agricultural produce to markets (Statistics Indonesia, 2020).

Research in the Environmental Journal shows that infrastructure damage slows down post-flood recovery and increases overall economic losses. Infrastructure improvements are therefore a priority to reduce the impact of future floods (Rosyadi et al., 2022). The impacts that occur due to flood disasters for agriculture in tajau landung village are as follows:

1. Less Optimal Harvest

In Tajau Landung Village, Banjar Regency, the phenomenon of suboptimal harvest has become a serious problem for farmers, especially due to crop failure caused by flooding. Under normal conditions, average yields range from 60-80 belek of rice, which is equivalent to 1200-

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1600 liters. However, during the last harvest season, farmers were only able to produce around 30-40 belek or 600-800 liters of rice. This significant decline reflects the reduced productivity of farmland due to various factors, including an erratic climate and increased pest attacks, but most severely the impact of the floods that hit the region. Floods not only damage crops that have already grown but also result in damage to agricultural infrastructure such as irrigation channels and access roads (Mutiani, 2017).

From the interview with Mr. Otek, he stated that the uncertainty of the season is a big challenge for agricultural activities in the area. He explained that currently, with climate conditions that are difficult to predict, heavy rains often occur even though it is already summer. This has a significant impact on planting time, which is usually done in March or April, but has to be delayed until May because the land is still waterlogged. As a result, when the rainy season in August and September arrived, the yields decreased drastically. From a potential yield of 120-160 liters, it is now only around 60-80 liters due to excessive waterlogging. This shows that climate change and extreme weather conditions have a huge influence on agricultural productivity in the area.

As a result of this decline in yields, farmers' economic conditions have worsened, especially in terms of the selling price of rice. Usually, farmers get a selling price in the range of IDR 70,000 - IDR 80,000 per bag. During this bad harvest season, the selling price dropped drastically to IDR 40,000 - 50,000 per bushel. This unstable price has caused farmers' income to decline further, making it impossible to meet their living needs and farm operational costs (Susanto & Indah, 2022). This uncertainty was further exacerbated by flood losses, where many farmers lost almost all of their crops.

The impact of sub-optimal harvests is felt in terms of capital for the next planting season. With incomes plummeting due to crop failure and low selling prices, farmers struggle to raise the necessary capital to purchase seeds, fertilizers and other operational costs (Rusmaniah et al., 2025). In many cases, they are forced to go into debt to meet these needs, which will burden them further in the next harvest season. Crop failure due to flooding creates an inescapable cycle of debt for farmers (Manalu, 2024).

This condition proves that agricultural productivity is not only influenced by technical factors in the field such as variety selection and cultivation techniques but also socio-economic and environmental aspects that cannot be ignored. This challenge requires serious attention from the government and various related parties to find the right solution so that farmers can return to optimal harvesting (Suryaningsih & Budiman, 2024). Handling natural disasters such as floods must be a priority in agricultural policy so that their impact can be minimized.

Collaboration between farmers, government, and non-government organizations is needed to create a more dominant and sustainable agricultural ecosystem. Through an inclusive and participatory approach, it is expected that the welfare of farmers in Tajau Landung Village can improve and the problem of suboptimal harvests can be resolved properly. Synergy between various parties will be the key to success in advancing the local agricultural sector and reducing the negative impacts of natural disasters such as floods (Marhamah et al., 2022).

Post-flood handling is also an important aspect that needs serious attention. After floods recede, agricultural land often suffers from degradation, such as increased soil acidity and residual mud that impairs fertility. Systematic land rehabilitation programs, such as liming to neutralize soil pH or removing crop residues, are urgently needed to restore land productivity. Without appropriate interventions, the negative impacts of flooding will continue into the next planting season, hampering farmers' economic recovery.

Provision of technical support and relevant technologies can help farmers adapt. The introduction of improved rice varieties to cope with waterlogging, the application of optimized irrigation and drainage systems, and training on sustainable farming practices in swamplands can increase farmers' resilience to climate fluctuations. Simple technologies, such as the use of

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portable water pumps or early weather detection devices, can also provide significant advantages for farmers in managing flood risks. Investing in agricultural innovation is thus key to breaking the cycle of disaster losses.

Strengthening the capacity of farmers is crucial so that they are able to optimally utilize technical and technological support. Intensive training programs on water management, the use of inundation-resistant varieties and post-flood land management need to be routinely promoted. In addition, the formation of active farmer groups can strengthen communication between farmers so that the latest information and agricultural adaptation methods can be easily disseminated. With this capacity building, farmers will not only be ready to face disaster risks, but will also be able to increase productivity in the long run.

Good environmental management is key to the sustainability of agriculture in the region. Soil and water conservation efforts through shade tree planting, river flow management and erosion control must become part of the local community's lifestyle. Social activities in the form of continuous education on the importance of environmental conservation and disaster risk reduction need to involve all elements of the community, including the younger generation. In this way, the negative impacts of flooding can be significantly reduced, while maintaining the balance of the ecosystem that supports the sustainability of agricultural productivity.

2. Pest Disrtubance Due to Stagnant Water

The flooding that occurred in Tajau Landung Village, Banjar Regency, resulted in significant impacts on the agricultural sector, especially on the increase in pest populations that were exacerbated by stagnant water conditions. One of the most troublesome pests is rats, which tend to appear during the rainy season. Flooding creates an ideal environment for rats to breed, as the presence of standing water forces rats to seek new, safer places to survive. Under these conditions, rats not only disrupt plant growth but also damage crop yields by stealing grains and stems of growing rice plants (Woensdregt, 2022).

Climate change that causes extreme rainfall intensity is predicted to continue to increase, so the potential for flooding in areas such as Tajau Landung Village is also greater. This requires farmers and policy makers to be more proactive in monitoring rat populations, especially before and during the rainy season. In addition, prevention efforts can be made by improving the water channel system around rice fields so that puddles recede quickly and do not become an ideal breeding ground for rats. Integration of biological prevention methods with more adaptive land management can also be a sustainable solution to reduce the negative impact of floods on rat pesticides in this region.

Apart from rats, the impact of flooding has also resulted in the emergence of other pests, such as golden snails or kalambuai. Golden snails are known to be one of the pest species that are very destructive to rice plants. The stagnant water that occurs during and after flooding provides an ideal habitat for golden snails to thrive. These snails have a destructive feeding habit, especially young rice stems, stunting growth and reducing the amount of harvestable crop. In one harvest season, an infestation of this pest can result in significant losses for farmers, both in terms of the quality and quantity of the harvest (Jannah & Pagiu, 2021).

Post-flooding golden snail control needs to be carried out systematically and continuously so as not to cause protracted losses. One effective approach is to carry out habitat management, for example by draining rice fields periodically to break the life cycle of golden snails. In addition, the introduction of natural enemies such as natural predators of golden snails can help suppress the population of this pest without damaging the surrounding ecosystem. The collective awareness of farmers to carry out joint management is very important, considering that golden snail pests easily spread and attack rice fields in several fields simultaneously.

From the interview with Mr. Hamdan, he stated that during the rainy season, rats tend to come out of their nests to look for food, such as rice in the fields and rice seedlings. This phenomenon represents a potential loss to agricultural yields, especially when water levels in

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rice fields rise, which can also attract other pests such as golden snails. This statement, obtained on December 9, 2024, reflects the significant challenges faced by farmers in trying to protect their agricultural production during the rainy season.

Based on the experiences of farmers like Mr. Hamdan, it is important for the farming community to establish a good communication and coordination system in dealing with post-flood pest threats. For example, the formation of farmer groups that regularly conduct counseling and evaluation of field conditions will accelerate the collective pest control response. Support from the government and research institutions is also very instrumental in providing the latest information and technology that suits local conditions. With the synergy between farmers, government and researchers, post-flood pest management can be more effective so that farmers' income is maintained and regional food security is stronger.

The agricultural ecosystem in Tajau Landung Village, the presence of rats and golden snails illustrates that flooding is not just an instant problem but an ongoing one. These pests often cannot be controlled by conventional methods as their numbers increase rapidly after disasters. Therefore, farmers should encourage more innovative pest management strategies, such as a combination of planting pest-resistant rice varieties and using biopesticides. This is important to reduce losses due to pest attacks if flooding occurs again (Jumiono et al., 2024). The effectiveness of rat and golden snail control after floods depends on farmers' understanding of the life cycle and behavior of these pests. For example, farmers need to know that rats adapt quickly to changing environmental conditions, so traditional extermination techniques may need to be modified to be more effective. On the other hand, to control the golden snail population, it is important to reduce unnecessary waterlogging and keep farming areas clean, so that their habitat can be eliminated.

The investigations conducted show that increases in pest populations, such as rats and golden snails, are often overlooked in disaster impact assessments. Yet, post-disaster pest management and control is an integral part of broader risk mitigation. Through a research-based approach, researchers can provide more effective data-driven recommendations to improve pest management in recently affected agricultural areas (Putra, 2020).

The impact of flood disasters on agriculture in Tajau Landung Village, particularly through pest infestations such as rats and golden snails, demands more structured and innovative mitigation efforts. With the right preparation and knowledge, losses due to post-disaster pest attacks can be minimized (Amin, 2021).

This post-flood pest problem requires more than just individual responses from farmers. It requires strong institutional support from both the local and central government. The government can facilitate programs that provide seedlings of superior varieties that are resistant to pests and inundation, as well as subsidies for environmentally friendly fertilizers and pesticides. In addition, a stable price policy and an agricultural insurance program that farmers can access will go a long way in reducing the financial burden of crop losses.

To improve farmers' ability to manage pests, sustainable agricultural training and extension programs are essential. This training should include materials on early identification of pests, post-flood pest life cycles, and effective and environmentally friendly integrated pest management (IPM) methods. With updated knowledge, farmers will be more alert in taking preventive and mitigating measures, so that losses can be minimized.

Technological innovation also plays an important role. The implementation of more efficient irrigation and drainage systems can help control stagnant water, which is the main trigger for golden snail breeding. The use of simple technologies, such as innovative rat traps or natural predators, can also be an effective and economical alternative for farmers. Further research on the adaptation of specific agricultural technologies for tidal marshlands is needed to find long-term solutions (Alwi, 2017).

3. Increased Acid Content in Soil

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Tajau Landung village, known for its agricultural land, has been seriously impacted by frequent flooding. One striking aspect is the change in the physical and chemical properties of the soil, especially the increase in acid content that affects agricultural productivity, especially rice. Prolonged flooding can cause crop damage and also alter soil composition, causing unfavorable conditions for plant growth.

The swamplands found in this area have unique characteristics as they are usually acidic. This is influenced by environmental factors such as geological conditions, rainfall, and the decay of plant debris. Swampland is often an ideal place for rice farming; however, when floods occur, this land becomes waterlogged for a long time. The decomposition of the waterlogged rice crop residue leads to the accumulation of organic acids, which further deteriorates the condition of the agricultural soil.

The decay process releases acidic compounds and is strongly associated with anaerobic conditions resulting from waterlogging. According to research conducted by Yusuf, prolonged waterlogging in agricultural land can trigger an increase in the concentration of sulfuric acid and other organic acids. As a result, soil pH decreases and the soil becomes more acidic. This disrupts the biogeochemical processes occurring in the soil, leading to an imbalance of nutrients needed by plants.

Figure 1.1 Flooded Paddy Fields

Source: personal data, 2024

Based on the picture above, the condition of waterlogged land without any water circulation causes stagnation which makes the soil unable to get oxygen properly. This certainly triggers adverse effects for decomposing microorganisms in the soil, which should function to break down organic matter and support soil fertility. Yusuf's research shows that the microbiological balance in agricultural land is critical to determining soil health. When this balance is disrupted, the soil's ability to provide nutrients for plants decreases.

Highly acidic soils are particularly risky for rice farming. A drop in soil pH to below 5 can inhibit the uptake of essential nutrients such as phosphorus and calcium, which are necessary for rice growth. Another effect is an increase in toxic elements in the soil that can damage the roots of these plants (Jamin & Risfaisal, 2021).

Prolonged flooding also increases the likelihood of soil erosion. When the soil is too acidic, the soil structure becomes brittle, and when it is eroded by water, nutrients are also released, reducing soil fertility. Erosion in agricultural areas can result in the loss of fertile and valuable soil layers, so it must be watched in the long term (Hidayah, 2023).

The impact of erosion is not only limited to nutrient loss but can also worsen the water quality around farmland. Water contaminated by soil particles can affect local aquatic ecosystems and add to the pollution load on other water resources.

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In the long term, the impact of increased acidity in swampland soils can create a negative cycle for agriculture. This will impact not only on rice yields but also on the availability of food for the community in Tajau Landung Village. Increased costs to improve the soil and manage the land is one of the consequences that can be felt by farmers (Prabowo & Sudrajat, 2021).

Excessive use of chemical fertilizers on land with low pH can worsen soil conditions. Fertilizers that are not optimally absorbed by plants due to inappropriate soil pH can accumulate and cause toxicity to soil microorganisms. These microorganisms are very important in maintaining the balance of the soil ecosystem, including helping the decomposition of organic matter and the absorption of nutrients by plants. Therefore, fertilization must be adjusted to the pH condition of the soil so as not to aggravate environmental problems and decrease land productivity in the rain (Utami et al., 2021).

Directly affecting soil and plants, high acid conditions also affect soil fauna, which is an indicator of land health. Organisms such as earthworms and nitrogen-fixing bacteria will experience population declines, leading to a reduction in the soil's ability to maintain natural fertility. As a result, land use becomes unsustainable and requires more intensive and costly interventions to maintain productivity. Therefore, mitigation through proper land management such as the application of agricultural lime and the use of cover crops needs to be implemented immediately (Vitiara et al., 2024).

The socio-economic impacts of land degradation due to acidity cannot be ignored either. Decreased agricultural productivity leads to decreased farmer income, which in turn can trigger poverty and population migration from villages to cities. The majority of Tajau Landung Village community as rice farmers are the main source of livelihood, can experience a significant decline in community welfare (Sudirah et al., 2020). Therefore, soil conservation efforts and education for farmers on sustainable agricultural practices are essential to maintain food security and social stability in the area.

Research by Prayitno notes that with rising production costs due to unhealthy soil conditions, accessibility for sustainable agriculture will be a challenge for local farmers. This economic instability can lead to further social problems, including population migration to seek employment in other areas (Prayitno et al., 2022). Efforts to improve soil conditions need to be made to overcome the impact of floods on agricultural land. One method that can be applied is soil rehabilitation by adding lime to neutralize soil acidity, crop rotation can also be one solution to gradually increase soil fertility and prevent acid buildup (Sufaidah, 2020).

By utilizing a more in-depth research approach, we can find more effective solutions to address these issues for the sustainability of agriculture. Therefore, further assessment of how to mitigate these impacts is crucial to ensure that agricultural land in Tajau Landung Village remains productive and able to adapt to increasingly erratic climate change.

Conclusion

Floods have a significant impact on agriculture in Tajau Landung Village. Floods often damage crops and result in suboptimal yields and pest infestations. Floods cause long periods of standing water, which results in suboptimal crop yields. In addition, this prolonged inundation also causes the emergence of pest problems such as rats and golden snails that are felt by farmers. These immediate impacts cause material losses to farmers, increase their vulnerability to poverty, and create income uncertainty. The long-term impact of flooding is also very much felt on the condition of agricultural land. Flooding can worsen the water quality around farmland and increase the acid content of the soil. These unhealthy soil conditions create a negative cycle for agriculture, which leads to reduced productivity and crop yields. Overall, the high frequency of flooding not only damages crops and land, but also significantly threatens agricultural production and community food security in Tajau Landung Village.

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