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RESILIENCE OF RICE FARMING HOUSEHOLDS IN FACING FLOOD DISASTERS: A CASE STUDY OF SUNGAI RANGGAS VILLAGE

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ABSTRACT

The agricultural sector plays a pivotal role in life as a provider of sustenance, contributing to the national economy, particularly in enhancing competitiveness, workforce absorption, and poverty alleviation. Through agriculture, there is potential to stimulate downstream agro-industrial growth, boost agricultural commodity exports for increased foreign exchange, and realize food sovereignty. The research aims to discern the resilience of farmers in the Village of Sungai Rangas in confronting flood disasters. The data employed consists of both primary and secondary sources. Primary data is acquired through interviews using prepared questionnaires, while secondary data is obtained from relevant institutions. A mixed-methods approach is employed for data analysis. Qualitative analysis is utilized to provide a profound description of resilience, while quantitative methods are employed to calculate gains based on the possessed social capital. The study reveals that human capital comprises factors such as age, educational level, and experience. Physical capital encompasses land ownership and boat possession. Natural capital involves the utilization of forest resources by extracting wood for sale. Financial capital includes investments in forms such as gold, which can be resold. Social capital comprises the social networks possessed. Livelihood structure comprises agricultural activities broadly categorized as On Farm (42%), Non-Farm (32%), and Off Farm (27%). The resilience constructed emphasizes the effective maximization of all available social capital.

KEY WORDS

Resilience, rice farmers, livelihood structures, flood disasters.

The agricultural sector has an important role in the life of a region because it functions as a provider of food, animal feed and bioenergy. The role of the agricultural sector is also very strategic in supporting the national economy, especially in realizing increased competitiveness, employment and poverty alleviation. Through agriculture, it can encourage the growth of downstream agro-industry and spur exports of agricultural commodities to increase foreign exchange and realize the country's food sovereignty. One of the provinces that is suitable for agricultural development in realizing national food sovereignty is South Kalimantan; where this area has large agricultural potential with superior food commodities such as lowland rice farming which is suitable for development. Based on data from the Central Statistics Agency (2022), the agricultural sector in South Kalimantan is one of the sectors that absorbs a lot of labor, namely 40% of the workforce. Most of the people of South Kalimantan make agriculture the main source of family livelihood. Because of this, the agricultural sector continues to be encouraged to become a mainstay sector with the superior commodity of lowland rice. Nevertheless; Paddy rice production in South Kalimantan still fluctuates from year to year. The Central Statistics Agency (2020-2022) noted that the harvested area and lowland rice production in the South Kalimantan area had decreased. Grain production in 2020 was 1,150,307 tons with a harvest area of 289,836 Ha. Grain



production in 2021 will be 1,016,314 tonnes with a harvest area of 1,016,314 Ha and grain production in 2022 will be 819,419 tonnes with a harvest area of 214,264 Ha. The decline in harvested area and production of lowland rice farming was caused by several factors; One of the main trigger factors is flooding.

Prolonged La Nina climate conditions have caused floods to hit agricultural land for the last three years, destroying farmers' land and also submerging rice crops for weeks. Apart from that, flooding also causes land infrastructure such as channels to be damaged so it takes time to repair. One of the districts affected by flooding and experiencing a significant decline in production is Banjar district. As one of the second rice producing districts in South Kalimantan and a rice supplier for parts of Kalimantan; Banjar Regency experienced a significant decline in production (BPS, 2020-2022). In 2020, the harvest area was 50,735 hectares with production of 190,762 tons of grain. In 2021, the harvest area will be 43,997 hectares with production of 169,163 tons of grain. In 2022, the harvest area will be 37,163 Ha with production of 129,051 tons of grain.

One of the villages that is often affected by floods that cause crop failure is Sungai Rangas Village in West Martapura District. Prolonged rain conditions caused the Rangas River to overflow, soaking rice plants to death. Topographically; The low position of rice fields means that water can easily enter farmers' land. This phenomenon certainly creates a need within oneself to maintain economic resilience through management and utilization of existing social capital. Keye & Pidgeon, (2013) and Resilience is an individual's ability to recover from sad and challenging life events by increasing knowledge to be adaptive and overcome adverse situations in the future. Desmita (2017) and Cao et al., (2023) Resilience is the flexible power, resilience, ability or human capacity possessed by a person, group or society which enables them to face, prevent, minimize and even eliminate the adverse impacts of unforeseen conditions. enjoyable, or changing miserable living conditions into something normal for the above.

Resilience is also the ability of a system, community or society affected by a disaster to resist, absorb, accommodate and recover from the impact of a hazard quickly and efficiently, including preserving and restoring important basic structures and functions as a disaster risk management effort (Marseva et al. al. 2016). Rice farmers who are often affected by floods must be able to adapt and be resilient in facing flood disasters. Resilience refers to the inherent and adaptive responses to disasters that enable communities to reduce or avoid losses (Wulansari, 2022, McMillen et al., 2016, Larimian et al., 2020).

The experience of disasters experienced by the community repeatedly can be used as a lesson to then be formulated into strategies for adaptation and recovery from disasters. In realizing this disaster adaptation and resilience strategy, resources such as; adequate infrastructure, the availability of adequate infrastructure, the existence of financial resources, social resources that support each other, quality human resources such as skills or expertise and finally the most crucial thing is the availability of natural resources. These five things are often defined as livelihood assets or assets in livelihoods (Ellis, 2000). These five capitals will greatly influence the resilience of society in facing disturbances or flood disasters. It is known that the more livelihood capital one has, the higher the level of resilience will be (Cahyani & Intan, 2015). Looking at these problems, the problem that will be discussed in this research is the resilience of rice farming households in facing flood disasters. Measurement of household resilience is based on the utilization of subsistence capital used and the subsistence structure of lowland rice farmers.

METHODS OF RESEARCH

The selection of the research location and respondents is purposive, with the consideration that Sungai Rangas Village is significantly affected by flood disasters and crop failures. The number of respondents interviewed is 30. The data types encompass primary and secondary data; primary data is acquired through interviews using prepared questionnaires, while secondary data is gathered from relevant institutions. A mixed-methods approach is employed for data analysis. According to Creswel (2015), a mixed-methods



approach is a strategy for investigating issues related to social behavior by rigorously collecting and analyzing both quantitative and qualitative data. Qualitative data analysis is utilized for a profound description of resilience, while quantitative methods calculate gains based on possessed social capital.

RESULTS AND DISCUSSION

Based on the conducted research, human capital in rice farming households in Sungai Rangas Village, North Martapura District, Banjar Regency, is identified based on the respondent age group, educational level, and skills. Age is a significant factor influencing work. Age has a substantial impact on work productivity; younger farmers tend to exhibit higher productivity. Human capital factors can affect decision-making patterns and skills (Kobesi et al., 2023). The analysis results indicate that the age range of most interviewed rice farmers in Sungai Rangas is 60-70 years, constituting 43%, followed by the age group of 50-59 years at 40%, and the age group of 40-49 years at 16%. Education is a crucial factor associated with decision-making ability, creative thinking, and acting. The analysis reveals that 70% of the interviewed respondents have primary education, while 30% have completed junior high school. Some respondents possess skills beyond farming, such as designing roofs made of light steel. In this job, household tasks are generally carried out collaboratively between the husband (head of the household) and children. This is because, typically, the children have reached adulthood and are capable of assisting when needed.

Physical capital among rice farmers in Sungai Rangas Village consists of land ownership or control, ownership of plantation land for other crops, ownership of motorcycles, and ownership of motorized boats (*Klotok*). In connection with the ownership of rice fields, it varies widely. Generally, land ownership ranges from 0.5 hectares to 1 hectare. However, some farmers cultivate land owned by others under a profit-sharing system. Based on the interviewed respondents, 20% of farmers work on a profit-sharing basis, while 80% work on their own land. The profit-sharing pattern is typically the same, with 75% of the production going to the cultivator and 25% to the landowner. Additionally, other physical assets include two-wheeled vehicles; most farmers own motorcycles for transportation. Regarding ownership of motorized boats (*Klotok*), 85% of the farming community in Sungai Rangas Village owns *Klotok*. This is because *Klotok* serves multiple functions as a means of transportation and an additional source of income for farmers, such as fishing in the river and transporting wood from the forest. Ownership of these physical assets is considered crucial capital.

Natural capital in this study refers to natural resources that play a vital role in human life and contribute to the economic improvement of rice farming families in Sungai Rangas Village. The economic interaction of natural capital can be unidirectional or reciprocal through investment and the provision of labor. In Sungai Rangas Village, based on the research results, natural capital consists of ownership of freely accessible forest wood and a river with capture fisheries, which allows farming communities to freely catch fish using their boats. The wood ownership rate shows that 15% of farming households harvest wood in the forest and sell it as an additional source of income. The harvested forest wood is typically 4 meters long and used as supporting poles for building construction, priced at Rp 4,000 per piece. Additionally, residents collect dry wood, bundle it, and sell it for Rp 5,000. Farmers also utilize the river's fish resources by catching fish. During floods that result in crop failure, farmers depend on fish catches for their livelihood, earning around Rp 50,000-Rp 75,000 per day. This livelihood diversification is implemented with the hope of achieving continuous living and adaptation to the situation (Turasih & Wibowo, 2012).

Social capital in this study encompasses all the actual and potential resources related to the ownership of a network of institutional relationships based on strong emotional ties. Social capital in Sungai Rangas Village can be seen through network ownership, participation in various associations, and the strength of relationships among community members. Social capital tends to unify various social domains, with each form able to meet different needs of individual members. Bonding social capital acts as a cohesive force,



strengthening specific identities. Social capital also builds better relationships in constructing identities and fostering improved reciprocity (Putnam in Fathy, 2019). Based on the research results, all respondents have good relationships with other community members, building strong relations among the residents. Interaction among Sungai Rangas Village residents is positive, with mutual assistance when needed. This indicates an overall picture of good social life in Sungai Rangas Village. Respondents' involvement in associations, whether cultural events, religious activities, or social groups like rotating savings and credit associations (*arisan*), is well established. Strong family bonds and a deep sense of care for others have long been ingrained and are considered a necessity, such as helping those in need and working together. Additionally, network ownership shows a similar pattern, where all households have social networks. Social networks can provide assistance such as financial aid, access to employment, and knowledge to enhance entrepreneurial efforts. This social capital has been nurtured and built over generations, forming a strong sense of solidarity among residents.

Financial capital here includes access to capital from banking institutions, cooperatives (credit), and individual saving abilities (money saving). During floods and increasing economic demands, some farmers borrow from cooperatives, but the amounts are not substantial. Loans are typically used to purchase basic necessities such as rice, medicines, or other essential needs. The repayment of the loan installments is made from the proceeds of fish catches. Additionally, financial capital, such as savings, is utilized. The saving ability of farmers household varies; some households do not routinely set aside their earnings, while others consistently save a portion of their income. The saving system involves gold that can be sold back whenever needed. This savings model is considered more effective by farmers due to its easy resale access and tends to have a high selling price. Some farmers also use remittances to meet daily needs or sudden needs during flood disasters, demonstrating effective financial management. According to Wenzel et al. (2020), people tend to use their finances according to their needs.

Livelihood structure, according to Ellis (2000), is the composition of household income from various sources obtained by household members for material well-being. This income is divided into cash income (in cash) or other contributions (in kind) for the material welfare of family members obtained from various livelihood activities. Based on this review, the income of Sungai Rangas Village farmers is divided into several parts: 1) income obtained from a wide range of livelihood activities in the agricultural sector, such as rice farming, other agricultural products, livestock sales, and fish catches. 2) non-farm income obtained from livelihood activities outside the agricultural sector, such as labor wages, trade, remittances, and assistance services. 3) Off Farm income obtained from livelihood activities outside the agricultural sector. The structure of community livelihoods varies due to pressure, as communities will use all their capabilities to survive (Januarti, 2022). The livelihood structure of Sungai Rangas Village households can be seen in the following figure 1.

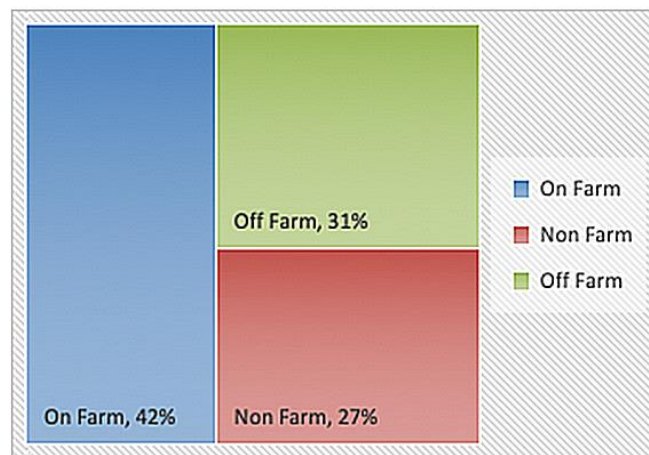


Figure 1 – Livelihood Structure of Sungai Rangas Village Farmers



Based on the research results, it can be observed that household income in Sungai Rangas Village is still dominated by On Farm sector income, reaching 42%, while Off Farm sector income is 31%, and Off Farm sector income is 27%. It can be said that households in Sungai Rangas Village are pure farmers, but their livelihood sources are not only from rice farming. Thus, farmers engage in other livelihood activities in agriculture as farm laborers or in non-agricultural sectors. More concerning is the condition of high rainfall in recent years, leading to floods and crop failures. The average monthly income earned by farmers in Sungai Rangas Village is approximately IDR 2,500,000 to IDR 3,000,000. This income can be classified as high, moderate, and low based on the calculations in the following table 3.

Table 3 – Monthly Income of Rice Farmers in Sungai Rangas Village

| Category | Amount | Percentage (%) |
|-------------------------|--------|----------------|
| High (Rp >3.000.000) | 3 | 10% |
| Moderate (Rp 3.000.000) | 14 | 47% |
| Low (Rp <3.000.000) | 13 | 43% |
| Total | 30 | 100 |

According to Table 3 above, it indicates that high household income is at 10%, moderate at 47%, and low at 43%. Based on this data, it is stated that the average income falls into the moderate category because during the flood season, farmers rely solely on livelihood sources derived from the utilization of skills such as construction laborers and fishing. This income is largely derived from the agricultural sector in the broader sense. Households in this category typically possess a resilient spirit, enabling them to adapt and maintain a strong sense of determination. They typically think creatively, utilizing the skills they have to survive.

Reivich and Shatte (2002) in their book "The Resilience Factor" define resilience as the ability to overcome or adapt to social phenomena (natural disasters, problems) that occur in life. Furthermore, Masten (2007) states that resilience generally refers to positive adaptation patterns during or after facing difficulties, making resilience an idea that refers to the dynamic system's capacity to endure or recover from disruptions. Resilience is the household's ability to withstand shocks (Saraswati & Dharmawan, 2015). The level of resilience in households is observed in the time it takes for households to return to normal, and this varies between households. Here is the resilience level of rice farming households in Sungai Rangas Village.

Table 4 – Resilience Level of Rice Farming Households in Sungai Rangas Village

| Resilience Level | Sungai Rangas Village | |
|------------------------|-----------------------|--------|
| High (< 3 Months) | 4 | 12,90% |
| Moderate (3-6 Months) | 17 | 54,84% |
| Low (> 6 Month) | 9 | 29,03% |
| Total | 30 | 100 |

Based on the above Table 4, the resilience level of households in Sungai Rangas Village is moderate, with 54.84% of households having a moderate resilience level, 12.90% with high resilience, and 29.03% with low resilience. Households with high resilience only take less than 3 months to recover. The difference in resilience levels is influenced by income from the agricultural sector in the broadest sense and also having additional ventures outside the agricultural sector. Farmers earn regular and relatively large incomes, which are then saved in cooperatives or invested in other valuable assets that can be sold back if needed. Households with moderate resilience in Sungai Rangas Village are usually those with other creative skills or have a wide-ranging agricultural income to support the family's economic conditions during floods. This creativity may involve skills in construction or working as a daily wage laborer, providing additional income even if not consistent. In contrast, households with low resilience typically lack savings and non-farm income sources. These farmers do not have many economic options, so in certain situations, such as crop failures due to shocks or disasters, it usually takes a long time for them to recover.



Rice farming households in Sungai Rangas Village generally employ similar forms of resilience. When rice fields are affected by floods, farmers utilize social capital built closely among neighbors, relatives, and other social networks. Farmers help each other by providing rice and instant food to those in need. They also capitalize on natural resources by catching fish in the river to generate additional income since fish production increases during floods. Additionally, they exploit the forest to obtain timber for building construction, which is then sold. Timber is often transported from the forest using boats for efficiency. Farmers also leverage their skills (human capital) to work as construction laborers on housing projects or other daily wage jobs within or outside the Sungai Rangas area. Farmers can also make use of investment capital or purchased assets. These strategies rescue rice farming households in Sungai Rangas from deterioration and hunger during crises or shocks caused by floods.

For households with high incomes or those heavily involved in the non-agricultural sector, they often invest by buying valuable items such as gold, vehicles, and other assets that can be liquidated. Overall, it can be said that the form of livelihood resilience involves utilizing all available social capital. This social capital has significantly aided farmer households during flood disasters. When a community member requires a substantial amount for living expenses, families or other neighbors voluntarily contribute. This mutual support allows households to economically persist despite various shortcomings. The closeness of these relationships serves as a source of strength for resilience and survival under pressure (Annet, 2010).

CONCLUSION

Based on the research findings, it can be concluded that the livelihood capital possessed by the community in Sungai Rangas Village includes human capital which comprised of age, education, experience, physical capital which comprised of land ownership, boat ownership, natural capital which comprised of utilization of forest resources by harvesting wood for sale, financial capital such as investment in gold, and social capital which comprised of community relationships and social networks. The livelihood structure consists of broad agricultural activities (On Farm) accounting for 42%, Off-farm activities for 31%, and Non-farm activities for 27%. The resilience built involves effectively maximizing all available social capital, which has been crucial in supporting rice farming households during flood disasters.

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