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ADAPTATION OF WETLAND FARMING COMMUNITIES TO MODERNIZATION: CASE STUDY IN JELAPAT 1 VILLAGE, INDONESIA

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Abstract

Modernization significantly impacts agricultural communities by introducing new technologies and market opportunities, alongside challenges such as urbanization, global competition, and climate change. This study investigates the adaptation strategies of farmers in Jelapat 1 Village, Tamban District, Barito Kuala Regency, Indonesia, where traditional knowledge and modern agricultural practices converge. Employing a qualitative case study approach, data were collected through observations, semi-structured interviews, and documentation. The results reveal that Jelapat 1 farmers employ various adaptation strategies, including adjusting planting patterns to tidal fluctuations, constructing simple water channels, selecting superior rice varieties, and using organic fertilizers. These practices reflect the integration of local wisdom and modern techniques to address challenges such as water management, pests, and climate change impacts. The study underscores the importance of supporting farming communities by developing agricultural policies that blend modern technology with traditional knowledge, thereby promoting sustainable agriculture.

Keywords: *Modernization, Adaptation, Wetland Farming, Jelapat 1 Village*

Abstrak

Modernisasi memiliki dampak signifikan terhadap komunitas pertanian dengan memperkenalkan teknologi baru dan peluang pasar, serta tantangan seperti urbanisasi, persaingan global, dan perubahan iklim. Penelitian ini menyelidiki strategi adaptasi petani di Desa Jelapat 1, Kecamatan Tamban, Kabupaten Barito Kuala, Indonesia, di mana pengetahuan tradisional dan praktik pertanian modern bertemu. Dengan menggunakan pendekatan studi kasus kualitatif, data dikumpulkan melalui observasi, wawancara semi-terstruktur, dan dokumentasi. Hasil penelitian mengungkapkan bahwa petani Jelapat 1 menerapkan berbagai strategi adaptasi, termasuk penyesuaian pola tanam terhadap fluktuasi pasang surut, pembuatan saluran air sederhana, pemilihan varietas padi unggul, dan penggunaan pupuk organik. Praktik-praktik ini mencerminkan integrasi kearifan lokal dan teknik modern untuk mengatasi tantangan seperti pengelolaan air, hama, dan dampak perubahan iklim. Penelitian ini menekankan pentingnya mendukung komunitas pertanian dengan mengembangkan kebijakan pertanian yang menggabungkan teknologi modern dengan pengetahuan tradisional, sehingga mendorong pertanian yang berkelanjutan.

Kata Kunci: *Modernisasi, Adaptasi, Pertanian Lahan Basah, Desa Jelapat 1*

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A. Introduction

Modernization significantly impacts farmers' lives. On one hand, modernization introduces new technologies, efficient farming methods, and broader market opportunities. On the other hand, it can cause rapid social and economic growth, urbanization, migration, and increasing global market competition. Regarding improving the quality of life, modernization brings positive changes such as increased income and enhanced living standards for farmers. However, there are cases where modernization does not yield the expected benefits, such as dependency on expensive agricultural inputs, climate change (Kansanga et al., 2019), and environmental degradation (Chong et al., 2019).

Theoretically, Power (2018)) describes modernization as a transformation process from a traditional society to a developed one. The modernization approach has influenced development thinking since the 1950s. It encompasses several principles: 1) societies develop along an evolutionary path; 2) societies experience different evolutionary stages based on structural and cultural differentiation and reintegration; 3) societies transition from premodern evolution to economic growth; and 4) societies adapt Western technology according to their cultural structures.

The complexity and challenges faced by agriculture, farmers, and farming communities in the modernization process are well-documented. Farming communities play a crucial role in developing and implementing agricultural policies, promoting sustainable agricultural practices, and forming networks to support information and resource sharing. Ploeg (2010) states that farming communities are essential in adapting agricultural practices to modernization due to their extensive knowledge and experience in traditional agricultural practices. Additionally, in contemporary times, farmers and their communities are vital as guardians of future food security and social awareness.

Modernization has influenced various aspects of farmers' lives, including production patterns, technology use, and natural resource management. Sustainable agriculture presents an alternative to modernization, aligning with farmers' and society's needs. The complexities of modernization require studying farming communities' adaptability to ensure these advancements provide maximum benefits. Research among farmers in the Cross River Valley in Nigeria found that the use of wetland agriculture is hampered by a lack of human resource capabilities, science and technology, misaligned policies, and land ownership complexities, impacting farmers' ability to adapt to climate change(Akpabio & Umoh, 2021). Conversely, research in Goa Village by Reddy et al. (2022) shows farmers' awareness of climate change, leading to adjustments in agricultural practices such as plant diversification, integrated crop-livestock systems, and new crop varieties adaptation. In this context, farming communities play a pivotal role in maintaining agricultural sector sustainability and promoting sustainable agriculture.

Several studies on modernization and farmer groups have been conducted. Wanta et al. (2021) concluded that agricultural modernization, while prioritizing local wisdom, improves land processing efficiency and effectiveness and increases farmers' income. Rifkian et al. (2017) found that modernization impacts job opportunities and farmers' incomes by transforming traditional farming patterns with modern agricultural technology and organizations. Tahir et al. (2019) discussed the shift from subsistence farming to commercial business, resulting in profitable investments and a change in farmer behavior from collective to individualistic values. Bagas et al. (2021) noted that only parts of the agricultural system have changed due to modernization, with

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improvements in land processing and post-production processes enhancing energy efficiency and community welfare.

Despite these references, there is a lack of in-depth studies on wetland farming practices in the current modernization era. The role of farming communities in modernization requires further exploration. Therefore, this research aims to uncover the adaptation of wetland farming practices by farming communities in the modernization era. Given the significant potential of wetlands as a source of community food security, research on wetland agriculture is essential.

B. Method

This research aims to uncover the role of farming communities in adapting to modernization, necessitating an in-depth understanding of the collected data. To address the research problems, a qualitative approach was employed to obtain comprehensive and detailed answers. The chosen research method is the case study method, specifically tailored for studying agricultural land in wetland regions. This research was conducted in Jelapat 1 Village, Tamban District, Barito Kuala Regency, a fertile and extensive wetland agricultural area with 25 farmer groups, the highest number in the region, indicating its agricultural dynamics. Data collection involved observation, interviews, and documentation. Observations focused on the activities of farmers and farmer groups in Jelapat 1 Village, serving as the initial step to guide the research focus. Semi-structured interviews were conducted with selected informants, including prominent figures in farmer groups, active members, community leaders, and willing participants. Documentation techniques gathered related documents, with field notes being the primary data source.

The data processing involved three stages: data reduction, data presentation, and conclusion drawing. During the data reduction stage, data was sorted and organized, focusing on the adaptation of the farming community to modernization through tidal swamp farming practices in Jelapat 1 Village. In the data presentation stage, the researcher compiled the data into a descriptive article to explain the farming community's ability to face modernization by incorporating local wisdom. At the conclusion drawing stage, the data was analyzed, integrating theory and field facts to derive conclusions. The study concluded that the farming community has preserved the local wisdom of wetland agriculture in response to the challenges of modernization.

C. Results and Discussion

1. Village Overview and Demographics

Jelapat 1 is a village in the Tamban sub-district, Barito Kuala district, South Kalimantan province, Indonesia. It is situated along the banks of the Barito River, the largest river in South Kalimantan, covering an area of 18,000 km². The landscape of Jelapat 1 Village is tropical, with an average annual rainfall of 200-300 mm. The village consists of residential areas and agricultural land, primarily tidal swamps. Residential settlements line the riverbanks. According to the Barito Kuala Regency Central Statistics Agency, the population is 5,899 people, with a density of 327.7 people per square kilometer.

Development in Jelapat 1 Village is ongoing, with road transportation connecting to sub-districts, districts, and provinces. Initial transportation was primarily via river routes, enabling quick access to the provincial capital, Banjarmasin, in about 15 minutes.

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The village has several office buildings, including government and private company buildings, schools, markets, and shops owned by residents.

The population of Jelapat 1 Village has diverse religious backgrounds. According to 2020 data from the Barito Kuala district, the religious composition is: Muslims (78.92%), Christians (20.70%), Protestants (19.43%), Catholics (1.27%), and Hindus or Kaharingan (0.38%). There are 1 mosque, 4 musholas, 2 Protestant churches, and 1 Catholic church.

2. Agricultural Practices and Modernization Challenges

Jelapat 1 Village is primarily a rice field area, with most residents working as farmers. Many young residents also work as laborers in private companies or other occupations. The workforce includes 4,795 farmers, 30 livestock breeders, 455 laborers, 7 health orderlies, 5 midwives, 325 civil servants, and 35 police officers, totaling 5,652 working-age individuals.

The village is dominated by tidal marshland, a characteristic feature of riverside lowlands, known for its high humidity and the influence of river tides. This type of land is referred to as "pasang pandit," indicating its state during high and low tides. Farmers use the term "luluk land" for agricultural land with a very soft texture, allowing water to flow in and out during tides.

Farming is the main livelihood for most Jelapat 1 residents, passed down from parents to children. Some farmers use it as a side job, while others farm due to the lack of alternative employment opportunities. Farmers use their harvest for family consumption and sell the surplus to meet other needs, reflecting a subsistence lifestyle. While subsistence farming is an adaptation to changing conditions, it poses a challenge to the commercialization of agriculture aimed at improving farmers' welfare (Waskitojati et al., 2019).

Modernization has a broad impact on farmers' lives, with climate change being a significant challenge (Wahyu & Nasrullah, 2012). Other challenges include technological and market changes (Handayani et al., 2019). Climate change affects water conditions on agricultural land, causing issues like dwarf pests and birds eating rice seeds. High tides can drown rice crops, and fluctuating water levels during river tides can disrupt planting schedules, leading to crop failures if they occur at the beginning of the planting season. Dwarf rice, caused by pests, and bird attacks also pose problems for farmers, requiring increased time and energy to protect crops.

3. Adaptation Strategies

Farmers in Jelapat 1 Village have developed several adaptation strategies to cope with these challenges. One key adaptation is adjusting planting patterns to the tidal fluctuations. The planting season for rice seeds is between November and February, timed according to water conditions. Farmers with land furthest from the river start planting in November, while those closer to the river plant in subsequent months. This staggered planting reduces the risk of crops being submerged during low tide (Wakhid & Syahbuddin, 2019).

Farmers have also made land improvements by constructing simple water channels to drain excess water, regulate water depth, and prevent flooding. Embankments, about fifty centimeters wide, separate different plots of land and serve as footpaths. These embankments are opened during high tide to ensure adequate water for the crops, symbolizing the harmonious relationship between farmers and the environment (Weng, 2000). Some farmers practice a mixed cropping system, planting crops like

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coconut, rambutan, orange, mango, chilies, long beans, and tomatoes along the embankments, known as the sorjan or surjan system (Dedi et al., 2014).

Selecting appropriate seeds is another adaptation strategy. Farmers plant superior rice varieties like unus, siam, and kupang, which are resistant to water conditions and pests (Wardah et al., 2012). These seeds are often sourced from the previous year's harvest, known as setilang seeds. While this practice reflects low innovation ability, it also demonstrates the use of local knowledge and wisdom in selecting suitable seeds for tidal swamps (Khairullah & Saleh, 2020).

The Gapoktan in Jelapat 1 Village provides organic fertilizer to its member farmer groups. The use of organic fertilizer reflects local wisdom in maintaining the balance of the wetland agricultural ecosystem, despite the pressures of modernization. Farmers have tried using fertilizers based on YouTube instructions, but often return to organic fertilizers due to their effectiveness and environmental benefits (Hildayanti & Alie, 2016).

Modernization does not necessarily mean adopting modern equipment and technology for agriculture (Morton & Olson, 2018; Rostati et al., 2021). Community wisdom involves managing environmental resources according to local needs and environmental conditions (Vita, 2016). The local knowledge gained from generations of farming experience in wetlands is crucial for land management. This local wisdom is a valuable asset for agricultural development amidst modernization (Maman et al., 2022). The agricultural practices in Jelapat 1 reflect adaptation to unique environmental conditions and the preservation of local wisdom in wetland farming.

D. Conclusion

Farmers Modernization brings both opportunities and challenges to agricultural communities, introducing new technologies and broader market opportunities while also causing social and economic changes such as urbanization, increased global competition, and climate change impacts. The farmers in Jelapat 1 Village have developed effective adaptation strategies to cope with these challenges, including adjusting planting patterns based on tidal fluctuations, constructing simple water channels, and selecting superior rice varieties that are resistant to water conditions and pests. These practices reflect a blend of traditional knowledge and modern agricultural techniques.

Local wisdom plays a crucial role in the farming practices of Jelapat 1 Village, where farmers utilize their extensive knowledge of tidal swamp agriculture to manage water conditions, pests, and crop planting schedules. This local wisdom, passed down through generations, is a valuable asset for sustainable agricultural development amidst modernization. The formation of farmer groups and the use of organic fertilizers highlight the community's collective efforts towards sustainable agriculture, providing support and resources to ensure environmentally friendly and economically viable farming practices.

Despite facing significant challenges, including climate change effects, pests, and fluctuating water levels, the resilience and adaptability of Jelapat 1 farmers underscore the importance of supporting farming communities in the face of modernization. This study underscores the need for agricultural development policies that integrate modern technology with local wisdom, enhancing the resilience of farming communities and promoting sustainable agriculture.

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