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Manaradak: The Banjar Community's Local Nursery System to Support the Resilience of Local Rice Cultivation Seeds in Kurau District, Tanah Laut Regency

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ABSTRACT

Local wisdom-based agricultural practices play an important role in maintaining food production sustainability and preserving local genetic resources. One of the traditional practices maintained by the Banjar community is *manaradak*, a local nursery system used in the cultivation of indigenous rice varieties. This study aims to analyze the *manaradak* nursery system of the Banjar community in supporting seedling resilience for local rice cultivation in Kurau District, Tanah Laut Regency. The study employed a qualitative approach using a case study method. Data were collected through in-depth interviews with local rice farmers, field observations, documentation, and a review of relevant literature on indigenous agricultural knowledge. The data were analyzed descriptively through data reduction, data display, and conclusion drawing to understand the processes, values, and contributions of the *manaradak* system to the sustainability of local rice cultivation. The findings reveal that *manaradak* is a nursery system developed from indigenous knowledge transmitted across generations and adapted to local agroecological conditions. The practice contributes to maintaining the availability of quality seedlings, enhancing plant adaptability to environmental conditions, and supporting the conservation of local rice varieties that represent the agricultural identity of the Banjar community. Furthermore, *manaradak* strengthens social cohesion through knowledge sharing and collaborative activities among farmers in nursery management. The system also serves as a local strategy for addressing agricultural production challenges, including environmental changes and limited access to commercial seeds. Therefore, *manaradak* represents a valuable form of local wisdom that significantly supports seedling resilience and the sustainability of local rice cultivation in Kurau District.

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INTRODUCTION

Local wisdom in agricultural practices has long been recognized as an important foundation for sustainable food systems and the preservation of agrobiodiversity. In many rural communities, traditional knowledge shapes cultivation techniques, seed management, and ecological adaptation strategies that are closely connected to local environmental conditions and cultural values. Among the Banjar community in South Kalimantan, manaradak is a traditional rice nursery system that continues to be practiced in the cultivation of local rice varieties [1]. This practice represents not only a technical stage of rice production but also a reflection of accumulated community knowledge and cultural heritage that has been transmitted across generations [2].

The expansion of modern agricultural systems, including the increasing use of commercial seeds and standardized cultivation methods, has contributed to the gradual decline of many indigenous farming practices [3]. Simultaneously, challenges such as climate variability, environmental degradation, and changes in land use have increased the vulnerability of local rice cultivation systems. Despite these pressures, farmers in Kurau District, Tanah Laut Regency, continue to maintain manaradak as an integral component of their farming activities [4]. However, limited scholarly

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attention has been given to understanding how this traditional nursery system contributes to the resilience and sustainability of local rice production.

Previous studies have highlighted the significance of indigenous knowledge in strengthening agricultural resilience, conserving biodiversity, and supporting sustainable rural livelihoods [5]. Community-based seed management systems have been shown to enhance farmers' adaptive capacity and maintain the availability of planting materials under changing environmental conditions. Nevertheless, research focusing specifically on local nursery practices remains limited, particularly within the context of Banjar agricultural traditions [6]. As a result, important aspects of local knowledge related to seedling preparation and management remain insufficiently documented.

This study examines manaradak as a local nursery system that supports the resilience of seedlings used in local rice cultivation. Particular attention is given to the technical processes, ecological considerations, and social interactions embedded within the practice [7]. By exploring farmers' experiences and knowledge, the study seeks to provide a comprehensive understanding of the role of manaradak in sustaining local rice production.

The research offers a novel contribution by documenting and analyzing manaradak as a unique form of Banjar agricultural knowledge that has received limited attention in previous studies. The findings are expected to contribute to the broader discourse on sustainable agriculture, local seed sovereignty, and the preservation of indigenous knowledge systems in rural development.

METHOD

This study employed an exploratory qualitative approach to gain an in-depth understanding of manaradak as a local nursery system practiced by the Banjar community in supporting the resilience of local rice seedlings in Kurau District, Tanah Laut Regency, South Kalimantan [8]. An exploratory qualitative design was selected because the study sought to explore indigenous knowledge, local practices, and community experiences that have received limited attention in previous research. This approach enabled the researcher to examine the meanings, processes, and values embedded within the manaradak system from the perspective of local farmers [9].

The research was conducted in villages within Kurau District where local rice cultivation and traditional nursery practices are still maintained [10]. Informants were selected using purposive sampling based on their knowledge and involvement in local rice farming activities. The participants consisted of experienced local rice farmers, community leaders, agricultural extension workers, and individuals recognized by the community as possessing knowledge related to manaradak. Additional informants were identified through snowball sampling to obtain more comprehensive information regarding the practice and its development over time [8].

Data were collected through in-depth interviews, participant observation, and documentation. In-depth interviews were conducted using semi-structured interview guides to explore farmers' experiences, perceptions, and knowledge regarding the implementation of manaradak [11]. Participant observation was carried out during nursery preparation and seedling management activities to document the technical processes and social interactions associated with the practice. Documentation included field notes, photographs, local records, and other relevant materials that supported data verification and interpretation.

The research procedure began with a preliminary field assessment to identify potential research sites and key informants. Subsequently, data collection was conducted through interviews, observations, and documentation. The collected data were organized, transcribed, and categorized according to emerging themes. The final stage involved data interpretation and validation through continuous comparison of information obtained from different sources.

The research procedure can be summarized as follows:

Identification of research location and key informants → Preliminary field observation → Data collection through interviews, observations, and documentation → Data transcription and organization → Data coding and categorization → Thematic analysis → Data validation through triangulation → Interpretation of findings and conclusion drawing.

Data analysis followed an interactive qualitative analysis process consisting of data reduction, data display, and conclusion drawing [11]. Data reduction involved selecting and organizing relevant information concerning nursery management practices, local knowledge, and seedling resilience. Data display was conducted through thematic matrices and narrative descriptions to facilitate interpretation. Conclusions were developed inductively based on recurring patterns and relationships identified in the data [11]. To ensure the trustworthiness of the findings, source triangulation, method triangulation, prolonged engagement in the field, and member checking were employed throughout the research process. These strategies enhanced the credibility, dependability, and confirmability of the study findings.

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RESULTS AND DISCUSSION

The findings of this study demonstrate that manaradak remains an important component of local rice cultivation among the Banjar community in Kurau District. Beyond its function as a nursery technique, manaradak represents a locally developed knowledge system that integrates ecological adaptation, seed management, and community participation [12]. Farmers perceive the practice as an effective strategy for ensuring the availability of healthy and resilient seedlings that are well adapted to local environmental conditions. The continuity of this system reflects the community's capacity to preserve agricultural traditions while responding to changing agricultural challenges [13].

The analysis further reveals that the implementation of manaradak contributes not only to seedling resilience but also to the preservation of local rice varieties and indigenous agricultural knowledge. The practice involves a series of carefully managed activities, including seed selection, nursery preparation, and seedling maintenance, which are guided by knowledge accumulated through generations of farming experience [14]. Moreover, the social interactions embedded within the process facilitate the transfer of knowledge among farmers and strengthen collective responsibility for sustaining local agricultural resources.

The discussion highlights that manaradak functions as both a technical and socio-cultural mechanism that supports the sustainability of local rice farming systems [15]. Its continued application demonstrates the relevance of local wisdom in addressing contemporary agricultural challenges, particularly those related to environmental uncertainty, seed sovereignty, and the conservation of agricultural biodiversity. Therefore, understanding and documenting manaradak provides valuable insights for developing agricultural policies and programs that recognize and integrate indigenous knowledge into sustainable rural development strategies.

3.1. General Condition of the Community in Kurau District

Kurau District is one of the agricultural areas in Tanah Laut Regency, South Kalimantan, where rice farming remains the primary livelihood for a significant proportion of the population. The district is characterized by extensive lowland and wetland ecosystems that support agricultural activities, particularly the cultivation of local rice varieties. The geographical conditions, combined with the community's long-standing farming traditions, have shaped an agricultural landscape that is closely connected to local knowledge and cultural practices[16].

The social structure of the community is strongly influenced by kinship relationships and collective values that encourage cooperation in various agricultural activities. Farmers commonly engage in mutual assistance during land preparation, planting, harvesting, and other farming operations [17]. Such collaborative practices not only strengthen social cohesion but also facilitate the transmission of agricultural knowledge from one generation to another. This social environment plays an important role in maintaining traditional farming systems and preserving local agricultural heritage [18].

Economically, agriculture serves as the main source of income for many households, although some community members are also involved in fisheries, small-scale trading, and other rural economic activities [19]. The dependence on agriculture has encouraged farmers to develop adaptive strategies that are suitable for local environmental conditions. As a result, traditional agricultural knowledge continues to be valued as a practical resource for sustaining productivity and reducing production risks [20].

The community of Kurau District possesses a rich body of indigenous knowledge related to rice cultivation, including land management, seed selection, nursery establishment, and water management practices. These forms of knowledge have been developed through long-term interaction with the local environment and are transmitted through daily farming activities and social interactions. Within this context, manaradak has emerged as an integral part of local rice cultivation, reflecting the community's efforts to maintain seed quality and ensure the sustainability of local rice production.

3.2. Overview of Manaradak as a Local Nursery System

Manaradak is a traditional nursery system practiced by the Banjar community as an initial stage in the cultivation of local rice varieties [21]. According to local farmers, manaradak refers to the process of preparing and nurturing rice seedlings in a designated nursery area before they are transplanted to the main field. The practice is considered an essential activity because it determines the quality and readiness of seedlings for subsequent cultivation stages [22]. Farmers believe that proper nursery management through manaradak contributes significantly to seedling vigor, uniform growth, and adaptability to local environmental conditions.

The origin of manaradak is closely associated with the agricultural traditions of the Banjar community, which have been developed through generations of interaction with the wetland and tidal ecosystems of South Kalimantan [23]. The practice emerged as a locally adapted strategy to ensure the availability of healthy seedlings under specific environmental conditions characterized by fluctuating water levels and seasonal changes [24]. Knowledge related to seed selection, nursery preparation, planting schedules, and seedling maintenance has been transmitted orally from older

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generations to younger farmers through direct participation in farming activities. As a result, manaradak has become an integral component of the community's agricultural heritage and collective knowledge system.

Within the local rice cultivation system, manaradak occupies a strategic position as a bridge between seed preparation and field cultivation [25]. The nursery stage allows farmers to monitor seed germination, select healthy seedlings, and reduce the risk of crop failure before transplantation. Through this process, farmers are able to optimize seedling growth and improve the overall performance of local rice cultivation. Beyond its technical function, manaradak also serves as a medium for knowledge exchange and social interaction among farmers, reinforcing the continuity of traditional agricultural practices within the Banjar community. The persistence of this nursery system demonstrates its relevance and effectiveness in supporting the sustainability of local rice farming in Kurau District.

3.3. Stages of the Manaradak Nursery Process

The implementation of manaradak consists of several interconnected stages that are carried out systematically to ensure the production of healthy and vigorous rice seedlings [26]. These stages reflect the accumulation of local knowledge developed through generations of farming experience and adaptation to the environmental conditions of Kurau District.

The first stage is seed selection. Farmers carefully select seeds from previous harvests based on specific criteria such as grain quality, maturity, and resistance to pests and diseases [27]. The selected seeds are usually obtained from the best-performing rice plants to maintain the characteristics of local rice varieties. According to one farmer, "We always choose seeds from healthy and productive plants because good seedlings begin with good seeds." This practice demonstrates the importance of farmer knowledge in maintaining seed quality and preserving local genetic resources.

The second stage involves the preparation of the nursery area. Farmers identify suitable locations with adequate water availability, fertile soil, and protection from flooding or other environmental disturbances [28]. The nursery land is cleaned, leveled, and prepared to create favorable conditions for seed germination and early seedling growth. Proper nursery preparation is considered essential because it influences seedling health and survival during the early stages of development.

The third stage is seed sowing [29]. After undergoing preliminary treatment, the selected seeds are evenly distributed across the prepared nursery beds. Farmers pay close attention to sowing density to ensure sufficient space for seedling growth and to minimize competition among plants [30]. During this period, environmental conditions such as water availability and weather patterns are continuously monitored to support successful germination.

The fourth stage consists of seedling maintenance [31]. Farmers regularly manage water levels, remove weeds, and monitor the nursery for signs of pests or diseases. Continuous observation allows farmers to respond quickly to potential problems that may affect seedling quality. As explained by another informant, "The nursery must be checked every day because young seedlings are vulnerable and require special attention." Such practices reflect the intensive care embedded within the manaradak system.

The final stage is seedling transplantation to the main rice field. Seedlings are transplanted when they have reached an appropriate age and level of development. Farmers carefully remove the seedlings from the nursery and transfer them to prepared paddy fields to minimize root damage and transplanting shock. The successful completion of this stage marks the transition from nursery management to field cultivation. Through these interconnected processes, manaradak serves as a crucial mechanism for ensuring seedling resilience and supporting the sustainability of local rice production in Kurau District.

3.4. Local Knowledge Embedded in Manaradak Practices

The practice of manaradak is deeply rooted in the indigenous knowledge of the Banjar community and reflects a long history of interaction between farmers and their surrounding environment [32]. This knowledge system has been developed through continuous observation, experimentation, and adaptation to local ecological conditions. Rather than relying solely on formal agricultural recommendations, farmers utilize locally accumulated knowledge to guide decision-making throughout the nursery process. As a result, manaradak represents not only a technical practice but also a repository of ecological wisdom that supports the sustainability of local rice cultivation.

One of the key elements of local knowledge embedded in manaradak is farmers' ecological understanding of environmental conditions [33]. Farmers possess detailed knowledge regarding soil characteristics, water availability, seasonal variations, and weather patterns that influence seed germination and seedling growth [34]. This understanding enables them to determine appropriate nursery locations and management practices that maximize seedling survival. Their decisions are often based on direct observations of environmental changes that have been accumulated through years of farming experience.

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Farmers also rely on various natural indicators when determining the timing of nursery establishment and other cultivation activities [35]. Changes in rainfall patterns, water levels, wind conditions, and seasonal transitions are commonly used as references for agricultural planning. These indicators serve as practical tools that help farmers anticipate environmental conditions and reduce production risks. The use of such indicators demonstrates the community's ability to interpret ecological signals and incorporate them into agricultural decision-making processes.

The knowledge associated with manaradak is largely transmitted through generations. Older farmers play a central role in teaching younger family members about seed selection, nursery preparation, seedling maintenance, and other aspects of rice cultivation [36]. This learning process occurs primarily through observation, participation, and direct experience in farming activities rather than through formal instruction. Consequently, agricultural knowledge becomes embedded within everyday practices and community life.

Intergenerational knowledge transfer contributes significantly to the continuity of manaradak within the Banjar farming community [37]. Through active participation in nursery activities, younger farmers gradually acquire the skills, values, and experiences necessary to sustain the practice. This process not only preserves technical knowledge related to rice cultivation but also reinforces cultural identity and collective responsibility for maintaining local agricultural heritage. The persistence of manaradak therefore illustrates the importance of indigenous knowledge systems in supporting agricultural resilience and the long-term sustainability of local farming communities.

3.5. The Role of Manaradak in Supporting Seedling Resilience

The findings indicate that manaradak plays a significant role in supporting seedling resilience within local rice cultivation systems in Kurau District. Farmers perceive the nursery stage as a critical foundation for achieving successful crop establishment and maintaining the productivity of local rice varieties [37]. Through careful seed selection, nursery preparation, and seedling management, manaradak contributes to the production of healthy seedlings capable of adapting to the environmental conditions of the cultivation area. The practice demonstrates how local knowledge can be utilized to strengthen the resilience of planting materials before they are transferred to the main field [38].

One of the primary contributions of manaradak is its role in improving seedling quality. Farmers implement various selection and management practices to ensure that only vigorous and healthy seedlings are transplanted. The nursery environment allows farmers to monitor germination rates, identify weak seedlings, and maintain optimal growing conditions during the early stages of plant development. As a result, seedlings produced through manaradak generally exhibit uniform growth, stronger root systems, and better overall health, which are important factors for successful rice cultivation.

Manaradak also enhances seedling resilience to environmental conditions. The nursery stage provides an opportunity for seedlings to develop gradually before being exposed to more challenging field environments [38]. Through continuous observation and management, farmers are able to reduce the risks associated with pests, diseases, and unfavorable weather conditions. This process helps strengthen seedling vigor and increases the likelihood of survival after transplantation. Farmers believe that seedlings raised through proper nursery management are better prepared to withstand environmental stresses encountered during the growing season.

Another important function of manaradak is its contribution to adaptation within wetland and tidal ecosystems that characterize many agricultural areas in Kurau District [1]. Local rice cultivation is strongly influenced by fluctuating water levels, seasonal flooding, and variations in soil moisture. The nursery system enables farmers to synchronize seedling development with environmental conditions, ensuring that transplantation occurs at an appropriate time. This adaptive capacity allows local rice farming systems to remain productive despite environmental uncertainties associated with wetland agriculture [4].

Furthermore, manaradak supports the continuous availability of seedlings throughout the planting season. By maintaining nursery activities and preserving local seed resources, farmers can secure a reliable supply of planting materials when needed. This reduces dependence on external seed sources and strengthens local seed sovereignty. The availability of resilient seedlings also contributes to the continuity of local rice cultivation and the preservation of traditional rice varieties that have long been cultivated by the Banjar community. Consequently, manaradak serves as both a technical and cultural mechanism that reinforces agricultural sustainability and resilience in Kurau District.

3.6. Social and Cultural Values in Manaradak

Beyond its technical function as a nursery system, manaradak embodies a range of social and cultural values that continue to shape agricultural life within the Banjar community. The practice is closely associated with collective participation, shared responsibility, and community-based learning, reflecting the social foundations of local agricultural systems [7]. Through manaradak, farming activities become not only a means of food production but also a medium through which social relationships and cultural traditions are maintained and strengthened.

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One of the most prominent values embedded in manaradak is mutual cooperation. Farmers often work together during various stages of nursery establishment and management, including land preparation, seed sowing, and seedling maintenance. Such collaborative activities reduce labor constraints while fostering a sense of collective ownership and responsibility[15]. The spirit of cooperation enables community members to support one another, particularly during periods of intensive agricultural work, thereby strengthening social cohesion within rural communities.

Manaradak also contributes to the development of farmer solidarity. The exchange of labor, knowledge, and farming experiences creates strong social bonds among community members. Farmers frequently share information regarding seed quality, cultivation techniques, weather conditions, and other agricultural concerns that affect crop production. These interactions facilitate collective problem-solving and reinforce trust among farmers. As a result, agricultural activities become a shared endeavor in which individual success is closely connected to the well-being of the wider farming community.

The practice further serves as an expression of Banjar cultural identity. As a tradition that has been maintained across generations, manaradak reflects the community's historical relationship with rice cultivation and the surrounding environment [20]. The continued use of local terminology, traditional knowledge, and customary practices demonstrates how agricultural activities contribute to the preservation of cultural heritage. For many farmers, maintaining manaradak is not only an economic necessity but also a way of preserving values and traditions inherited from their ancestors.

In addition, manaradak functions as an important mechanism for the transmission of agricultural culture from one generation to the next. Younger community members learn farming skills, ecological knowledge, and cultural values through direct participation in nursery activities alongside parents, relatives, and experienced farmers. This process ensures that both technical expertise and cultural meanings associated with local rice cultivation remain relevant within contemporary rural life. Therefore, manaradak represents more than a nursery practice; it serves as a cultural institution that supports social continuity, community resilience, and the preservation of Banjar agricultural heritage.

3.7. Challenges and Sustainability of Manaradak

Despite its important role in supporting local rice cultivation, the continuity of manaradak faces several challenges arising from social, economic, and environmental changes [25]. The transformation of agricultural systems, technological developments, and shifting community dynamics have influenced the way farmers manage cultivation activities. While manaradak continues to be practiced by many farmers in Kurau District, its long-term sustainability depends on the community's ability to adapt to these emerging challenges while preserving the knowledge and values embedded within the tradition.

One of the major challenges is the increasing modernization of agriculture. The introduction of mechanized farming practices, improved cultivation technologies, and standardized agricultural recommendations has altered traditional farming systems in many rural areas [27]. Although modernization offers opportunities to improve efficiency and productivity, it may also reduce the use of local practices that are considered less practical or economically competitive. Consequently, some elements of indigenous agricultural knowledge risk becoming marginalized within contemporary farming systems.

The growing availability of commercial seeds also presents a challenge to the sustainability of manaradak. Commercial varieties are often promoted for their high yield potential and uniform characteristics, encouraging farmers to rely on external seed sources. This trend may gradually reduce the cultivation of local rice varieties and weaken traditional seed management systems that have been maintained through generations. As dependence on commercial seeds increases, the role of manaradak in preserving local genetic resources may become less prominent.

Another challenge relates to farmer regeneration. Many experienced farmers possess extensive knowledge regarding nursery management, local rice cultivation, and environmental adaptation; however, the transfer of this knowledge to younger generations is not always guaranteed [31]. Changes in educational aspirations, employment opportunities outside agriculture, and rural-to-urban migration have reduced youth participation in farming activities in some communities. If this trend continues, valuable knowledge associated with manaradak may be lost over time.

Climate change further influences the sustainability of local agricultural practices. Unpredictable rainfall patterns, prolonged flooding, drought events, and other environmental disturbances can affect nursery establishment and seedling development. Farmers are increasingly required to adjust planting schedules and management strategies to cope with changing environmental conditions [35]. Although local knowledge provides adaptive mechanisms, the magnitude of contemporary climate-related challenges may exceed traditional experiences accumulated in previous generations.

Nevertheless, significant opportunities exist for the preservation and revitalization of manaradak. Growing recognition of indigenous knowledge, sustainable agriculture, and local seed sovereignty has increased interest in

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documenting and protecting traditional farming practices. Support from educational institutions, government agencies, agricultural extension services, and local communities can contribute to the preservation of this valuable knowledge system. By integrating local wisdom with appropriate innovations, manaradak can continue to serve as a relevant and effective nursery system that supports agricultural sustainability, cultural preservation, and the resilience of local rice farming in Kurau District.

3.8. Manaradak as Indigenous Agricultural Knowledge for Sustainable Rice Farming

The findings of this study indicate that manaradak represents a form of indigenous agricultural knowledge that has been developed through continuous interaction between the Banjar community and its surrounding environment. As a locally embedded practice, manaradak reflects the principles of local wisdom, whereby knowledge is generated, adapted, and transmitted based on collective experiences accumulated over generations [38]. The persistence of this nursery system demonstrates that local communities possess valuable knowledge resources capable of supporting agricultural production while maintaining ecological balance and cultural continuity. The practice illustrates how local wisdom functions not only as a cultural asset but also as a practical mechanism for addressing agricultural challenges within specific environmental contexts.

The study also highlights the contribution of manaradak to seed sovereignty. Through the selection, preservation, and management of local rice seeds, farmers maintain control over planting materials and reduce dependence on external seed sources [15]. This autonomy enables farming communities to preserve local rice varieties that are adapted to local ecological conditions and cultural preferences. The continued use of community-managed seed systems strengthens the capacity of farmers to determine their own agricultural practices while safeguarding valuable genetic resources from erosion. In this context, manaradak serves as an important component of local efforts to sustain seed sovereignty and agricultural independence.

From the perspective of agricultural resilience, manaradak provides a mechanism through which farmers can enhance their capacity to cope with environmental uncertainty and production risks. The nursery process allows farmers to monitor seedling development, select healthy planting materials, and adjust cultivation activities according to environmental conditions [7]. Furthermore, the ecological knowledge embedded within the practice enables farmers to respond to changes in water availability, seasonal variations, and other environmental factors. These adaptive characteristics contribute to the resilience of local rice farming systems and support their ability to remain productive under changing conditions.

The findings further demonstrate that manaradak aligns closely with the principles of sustainable agriculture. The practice promotes the utilization of local resources, encourages biodiversity conservation through the maintenance of local rice varieties, and supports environmentally adapted cultivation strategies [15]. At the same time, it strengthens social sustainability by facilitating knowledge sharing, collective action, and intergenerational learning among farming communities. The integration of ecological, social, cultural, and economic dimensions within manaradak illustrates the holistic nature of sustainable agricultural systems rooted in indigenous knowledge [12].

Therefore, manaradak should be understood not merely as a traditional nursery technique but as a comprehensive knowledge system that contributes to sustainable rice farming. Its continued existence demonstrates that indigenous agricultural practices remain relevant in contemporary agricultural development and can complement modern approaches to achieve greater sustainability, resilience, and community empowerment. Recognizing and supporting such practices is essential for ensuring the long-term sustainability of local food systems and the preservation of agricultural heritage in rural communities.

1. CONCLUSION

Manaradak remains an important indigenous nursery system practiced by the Banjar community in Kurau District, Tanah Laut Regency, in supporting the sustainability of local rice cultivation. The practice embodies a combination of ecological knowledge, cultural values, and community-based agricultural management that has been developed and maintained across generations. Through careful seed selection, nursery preparation, seedling maintenance, and transplantation, manaradak contributes to the production of healthy and resilient seedlings that are well adapted to local environmental conditions.

The findings demonstrate that manaradak plays a significant role in strengthening seedling resilience, preserving local rice varieties, and supporting seed sovereignty within farming communities. Beyond its technical function, the practice promotes social cohesion, intergenerational knowledge transfer, and the preservation of Banjar agricultural identity. Despite challenges associated with agricultural modernization, commercial seed adoption, climate change, and limited farmer regeneration, manaradak continues to provide a locally relevant strategy for sustaining rice production and maintaining agricultural biodiversity.

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As a form of indigenous agricultural knowledge, manaradak reflects the principles of local wisdom, agricultural resilience, and sustainable agriculture. Therefore, efforts to document, preserve, and integrate this traditional practice into contemporary agricultural development initiatives are essential for strengthening local food systems and ensuring the long-term sustainability of local rice farming in South Kalimantan.

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CONFLICT OF INTEREST STATEMENT

The authors declare that there are no conflicts of interest regarding the publication of this paper. The authors have no known competing financial interests, personal relationships, or professional affiliations that could have appeared to influence the work reported in this study.

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