



Post Harvest Practices among the Muna Ethnic Group: A Literature Review on Local Wisdom in Sustainable Agriculture

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ABSTRACT

Post-harvest practices are a critical phase in the agricultural production system, directly affecting the quality, quantity, and market value of harvested crops. In Indonesia, particularly among indigenous communities such as the Muna ethnic group in Southeast Sulawesi, post-harvest activities are still conducted using traditional methods passed down through generations. This literature review aims to identify, analyze, and evaluate the traditional post-harvest practices of the Muna people and assess their relevance within the framework of sustainable agriculture. The study draws upon scientific publications, ethnographic records, and research reports related to traditional farming systems and local wisdom in the Muna region. The findings reveal that practices such as bamboo granary storage (tambu), sun-drying methods, and crop bartering systems carry ecological, social, and economic values that align with the principles of sustainable agriculture. Despite the advancement of modern technologies, these indigenous practices remain relevant as they contribute to environmental conservation, strengthen local food security, and preserve cultural heritage. This study recommends integrating these traditional practices into sustainable agricultural development programs grounded in local wisdom.

Keywords: *Traditional Post Harvest Practices, Muna Ethnic Group, Sustainable Agriculture, Local Wisdom, Literature Review.*

INTRODUCTION

Agriculture is one of the most strategic sectors in supporting food security, community welfare, and ecosystem sustainability. In practice, agricultural activities extend beyond cultivation and include post-harvest processes, which play a significant role in determining the quality and market value of agricultural products. Post-harvest handling includes activities such as drying, storage, packaging, and distribution, which if not managed properly can result in post-harvest losses of up to 30% (FAO, 2021). Therefore, optimizing post-harvest practices is a crucial factor in enhancing the productivity and efficiency of agricultural systems, particularly in rural areas that depend heavily on agriculture as their primary livelihood.

Amid the growing dominance of modern post-harvest technologies, various indigenous communities in Indonesia continue to uphold traditional practices rooted in local wisdom. One such community is the Muna ethnic group in Southeast Sulawesi, which is well-known for its agricultural systems grounded in tradition and cultural values. The Muna people's post-harvest practices are not only aimed at preserving agricultural yields but also at maintaining harmony with their natural environment and social systems. This knowledge is transmitted orally and experientially across generations, primarily through the role of customary leaders rather than formal education (La Ode, 2018). As such, these traditional practices are not merely technical methods but also reflect a worldview that emphasizes the balance between humans and nature.

Traditional post-harvest approaches practiced by indigenous communities like the Muna are often overlooked in modern academic discourse. In fact, these practices carry significant value in the context of sustainable agriculture, a concept that encompasses environmental preservation, social sustainability, and economic viability (Pretty, 2018). In many cases, local practices that have evolved organically within indigenous communities are more sustainable than high-input intensive systems. For example, the use of natural materials for drying, local-based storage techniques, and non-commercial distribution systems not only have minimal environmental impact but also strengthen local food security (Lestari & Badu, 2020).

Historically, the Muna people have developed unique post-harvest techniques, including the use of bamboo granaries known as tambu and sun-drying methods utilizing woven mats. These energy-efficient techniques extend the shelf life of staples such as rice, maize, and tubers. Furthermore, the distribution of harvests is often conducted through mutual

cooperation and bartering systems that reinforce social cohesion and reduce dependence on external markets (Marzuki, 2019). Such mechanisms enhance community resilience in facing food crises and climate change core objectives of sustainable agricultural development as outlined in the 2030 Agenda for Sustainable Development Goals (SDGs).

However, these traditional practices are increasingly threatened by modernization, urbanization, and socio-cultural transformation. Modern technologies, while offering efficiency, often displace local practices without accounting for their embedded ecological and social values. Moreover, agricultural development policies in Indonesia tend to adopt technocratic approaches and have yet to fully accommodate local knowledge systems (Nurhayati & Rahman, 2023). As a result, many traditional post-harvest practices such as those of the Muna community are being abandoned by younger generations who perceive them as obsolete within the context of modern agriculture.

Previous studies have shown that integrating local wisdom into agricultural systems can improve efficiency and enhance community adaptive capacity to environmental changes. According to Altieri and Nicholls (2017), agroecology based on indigenous knowledge offers a critical pathway toward building resilient agricultural systems in the face of climate change and food insecurity. Therefore, it is imperative to document, examine, and elevate traditional practices such as the Muna post-harvest methods within academic discourse so they can inform the formulation of more inclusive and sustainable agricultural policies.

In light of the above, this literature review aims to examine and analyze the traditional post-harvest practices of the Muna community through the lens of sustainable agriculture. This study not only explores the technical dimensions of traditional post-harvest methods but also evaluates their embedded social, cultural, and ecological values. By employing a literature-based approach, the study seeks to contribute to the development of sustainable agriculture models grounded in local wisdom and to support the preservation of traditional agricultural practices as an integral part of local community identity and resilience.

METHODS

This study employs a literature review approach aimed at exploring, examining, and analyzing various scholarly sources related to the traditional post-harvest practices of the Muna ethnic group and their relevance to the principles of sustainable agriculture. The literature review was chosen as it allows the researcher to investigate agricultural and cultural

phenomena from multiple theoretical and empirical perspectives established in prior research. This approach also provides a framework to connect the technical aspects of post-harvest practices with their embedded social, cultural, and ecological values.

The data collection process involved a systematic search of scholarly literature from national and international journals, ethnographic books, institutional research reports, FAO documents, and relevant popular articles. The inclusion criteria covered publications from the past ten years (2013–2023) focusing on traditional agricultural practices, post-harvest handling, sustainable agriculture, and local wisdom in Southeast Sulawesi, particularly among the indigenous Muna community. Literature searches were conducted using databases such as Google Scholar, DOAJ, SINTA, and the National Library of Indonesia (Perpusnas), employing keywords including: traditional post-harvest, Muna ethnic group, sustainable agriculture, local wisdom, and agroecology.

Data analysis was conducted using thematic content analysis, which involves identifying recurring themes across the literature, such as drying techniques, storage systems, crop distribution methods, and the ecological and social dimensions of these practices. The data were then categorized and compared against the core principles of sustainable agriculture, as outlined in official documents such as The FAO Sustainability Framework and agroecological literature (Altieri & Nicholls, 2017). Through this method, the study reveals the interconnection between traditional Muna post-harvest practices and the broader framework of agricultural sustainability.

RESULTS AND DISCUSSION

1. Identification of Traditional Post-Harvest Practices among the Muna Ethnic Group

a. Natural Drying: Energy Efficiency Rooted in Local Wisdom

Natural drying is one of the primary post-harvest practices preserved by the Muna community. This method involves utilizing direct sunlight as an energy source and woven bamboo mats as drying platforms. Agricultural commodities such as rice, maize, and tubers are typically sun-dried in open areas around the household. This technique is not only cost-effective but also aligns with the principle of energy efficiency in sustainable agriculture (Yusran, Fitriana, & Hidayat, 2023). It requires no modern equipment, making it particularly suitable for rural regions with limited technological access.

Beyond energy savings, this method effectively preserves crop quality in an organic

manner. The Muna people apply indigenous knowledge passed down through generations to determine the most suitable times for drying, based on long-term weather patterns. This meticulous practice reflects a localized environmental awareness and adaptive capacity. According to Putri, Sahar, and Darmawan (2022), manual, culturally-informed drying techniques are effective in reducing moisture content while preserving the nutritional value and flavor of produce without the need for chemical additives.

From a sustainability perspective, traditional sun-drying methods contribute to carbon emission reduction and promote environmentally friendly energy use. The Food and Agriculture Organization (FAO, 2021) underscores the importance of indigenous practices as adaptive strategies in addressing climate change. This is further supported by Ismail and Rahim (2024), who argue that traditional drying methods significantly reduce the agricultural sector's carbon footprint. Therefore, preserving the Muna's natural drying techniques deserves serious consideration in the formulation of environmentally driven agricultural policies.

b. Storage in Tambu: Crop Protection and Food Rotation

A prominent expression of local wisdom in Muna post-harvest practices is the use of tambu, a traditional granary built from bamboo or wood. These granaries are typically elevated above ground and roofed with thatch or palm leaves to prevent pest intrusion and to allow for natural ventilation. Tambu systems have proven effective in storing harvested crops over extended periods and in ensuring food supply stability throughout the year (Salam, Arsyad, & Nugraha, 2023). This method illustrates the strong integration of local technology with the Muna community's socio-cultural and ecological systems.

Technically, tambu granaries are designed with natural ventilation features to maintain optimal humidity and temperature levels. Crops such as rice and maize are stored without chemical preservatives, relying instead on seasonal storage rotation and airflow. Research by Safitri, Ahmad, and Wahyuni (2021) found that traditional granaries in eastern Indonesia can preserve the quality of unhulled rice (gabah) for up to 6–12 months. This system supports regular food rotation and promotes local food security through farmer self-reliance.

The implementation of tambu aligns with sustainable agriculture goals, which emphasize the use of local materials, structural durability, and efficiency in post-harvest management. A recent study by Ramadhani and Jufri (2024) reports that community-based traditional storage systems result in lower post-harvest losses compared to modern storage

facilities without accompanying technical training. Thus, tambu represents more than just a storage structure it symbolizes the autonomy and empowerment of local farming communities committed to sustainability.

c. Barter and Collective Storage Systems: Strengthening Social Solidarity and Local Food Distribution

Barter systems remain an active component of post-harvest practices in some Muna communities. These involve the exchange of crops between families or farmer groups without the use of currency. Barter not only serves economic functions but also reinforces social cohesion within the community. According to Rahayu and Syamsuddin (2022) such crop exchange mechanisms help stabilize household food supply, especially during market fluctuations or supply crises.

In addition to barter, collective storage practices represent a form of organized social solidarity. Harvested crops from multiple families are stored in communal granaries managed cooperatively. Distribution schedules, quality monitoring, and stock usage are coordinated through consensus and traditional norms. Maulidah and Satria (2023) highlight that collective storage systems strengthen village-level food reserves and reduce dependence on government aid during crop failures.

In the context of sustainable agriculture, this approach represents a fair, localized, and participatory food distribution model. The FAO (2021) emphasizes that agricultural development must include not only production but also community-based post-harvest management and distribution. The barter and collective granary systems of the Muna community exemplify traditional models that integrate social justice with food sustainability. Therefore, these practices should be preserved and promoted as part of inclusive and resilient rural development strategies.

2. Relevance to the Principles of Sustainable Agriculture

a. Ecological Aspects

The traditional post-harvest practices of the Muna ethnic group such as sun-drying and bamboo granary (tambu) storage demonstrate a high level of ecological awareness and are closely aligned with the principles of sustainable agroecology. Drying crops without fossil fuel use is not only environmentally friendly but also minimizes carbon footprints. On a global scale, this approach reflects the concept of Low External Input Sustainable Agriculture

(LEISA), which emphasizes the use of local resources and the optimization of natural energy (Tittonell, 2024). By avoiding artificial dryers and chemical additives, the Muna people maintain environmental integrity and ensure the long-term sustainability of their agroecosystem.

Furthermore, the bamboo granaries function as a mechanism for the conservation of local agricultural biodiversity. These structures are not merely for crop storage but also serve as seed banks for the following planting seasons. As noted by Fauzi, Hakim, and Lestari (2023), the practice of seed preservation by indigenous communities contributes significantly to the conservation of endemic crop varieties that are resilient to climate variability. This highlights the role of traditional farming systems in safeguarding biodiversity and enhancing sustainable food security.

Equally important, these methods foster a harmonious relationship between humans and the natural environment, avoiding the excessive exploitation of natural resources. Agriculture based on local practices and minimal external inputs supports ecological cycles with minimal disruption (Wibowo & Santika, 2023). This underscores the ongoing relevance of indigenous knowledge such as that of the Muna in informing contemporary models of sustainable agriculture.

b. Social Aspects

The social dimensions of the Muna's traditional post-harvest practices affirm that agriculture is not solely a production activity, but also a means of preserving social and cultural values. Practices such as communal sun-drying, collective storage systems, and harvest rituals provide opportunities for intergenerational social interaction. Knowledge related to post-harvest management is transmitted orally and sustained across generations, a process referred to in sociocultural studies as indigenous knowledge transmission (Nurhasanah, 2023). This contributes to cultural continuity and strengthens social sustainability within traditional agricultural systems.

Moreover, collective systems such as the tambu function not only as storage infrastructure but also as communal hubs that reinforce social cohesion. As highlighted by Rismawati and Putra (2024), collective practices among indigenous communities foster shared ownership and mutual support, particularly in times of food scarcity or natural disaster. Within the Muna context, these practices enhance social resilience and strengthen local support

networks, which are essential components of community-based sustainability.

These traditions also reflect strong cultural resilience in the face of globalization and modernization. The Muna people actively preserve their ancestral systems while selectively adapting to contemporary changes. According to Hidayat, Sari, and Yuliana (2024) the ability of communities to sustain traditional practices while embracing innovation is a foundational aspect of social sustainability in local food systems. Thus, the high level of social engagement in the Muna's post-harvest practices provides a compelling example of community-based social sustainability.

c. Economic Aspects

Economically, the traditional post-harvest practices of the Muna community significantly reduce dependence on external inputs one of the core principles of sustainable agriculture. The use of locally sourced materials, such as bamboo for constructing granaries, and reliance on solar drying contribute to significantly lower production costs. According to Safitri and Darmawan (2023), reducing external input costs is crucial for maintaining profit margins among smallholder farmers in remote areas. This demonstrates that traditional farming is not a backward system, but rather an efficient adaptation to local economic constraints.

Furthermore, the presence of barter systems and collective storage arrangements fosters a resilient community-based economy, which is better able to withstand market volatility. Crop exchange among community members promotes equitable food distribution without relying on formal market mechanisms. A study by Prasetyo and Laili (2023) found that local economies based on social solidarity, such as barter systems, enhance economic resilience in the face of inflation and food crises. In this light, the Muna's traditional economic systems reflect principles of circular and inclusive economies.

These locally developed economic models also offer potential for the growth of agroecotourism or culturally based creative economies, which can generate added value. As Yusran et al. (2024) suggest, strengthening local economies through the preservation of traditional practices can serve as an integrative strategy for sustainable rural development. Therefore, Muna post-harvest practices contribute not only to ecological and social sustainability but also pave the way toward rural economic self-reliance.

3. Challenges and Opportunities

a. Challenges

One of the primary challenges in preserving the traditional post-harvest practices of the Muna ethnic group is the lack of systematic and comprehensive scientific documentation. Much of this traditional knowledge has been transmitted orally and remains largely undocumented in written or academic form, making it increasingly vulnerable to erosion amid modernization and shifting values within local communities (Sulistyo & Wijayanti, 2023). Although modern agricultural technologies offer improved efficiency, they often displace local practices that have long proven to be adaptive and environmentally sound. Additionally, limited recognition by policymakers regarding the value of indigenous knowledge in sustainable agricultural development has resulted in a lack of institutional support, such as inclusive programs or incentives (Nugraheni & Putra, 2022). Without formal acknowledgment and protection of indigenous rights over their agricultural practices, the threat of cultural loss becomes more imminent.

b. Opportunities

Despite these significant challenges, traditional post-harvest practices of the Muna community offer considerable opportunities for development within the framework of contemporary sustainable agriculture. A strategic step is the integration of such local knowledge into agricultural education curricula, both at the secondary and tertiary levels, especially in regionally based institutions. This approach not only introduces students to time-tested, environmentally friendly techniques but also fosters appreciation for local agricultural culture (Mulyadi & Arifin, 2023). Moreover, empowering indigenous communities as custodians of traditional agricultural knowledge can serve as a model for community-based participatory development. Programs that include participatory documentation, capacity-building, and support for local-wisdom-based agroecotourism can provide space for traditional post-harvest practices to coexist with modern innovations preserving cultural identity while strengthening local food resilience (Sari & Hamdani, 2024).

CONCLUSION AND IMPLICATIONS

The traditional post-harvest practices of the Muna ethnic group demonstrate strong alignment with the core principles of sustainable agriculture from ecological, social, and

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economic perspectives. Methods such as sun-drying on bamboo mats exemplify energy efficiency without reliance on external resources, contributing to localized environmental conservation. The use of tambu (bamboo granaries) for crop storage serves not only as an effective pest-resilient solution but also reflects the ingenuity of local wisdom in utilizing readily available natural materials. In addition, systems of barter and collective storage illustrate how social solidarity and food justice remain central pillars of agricultural life in Muna society consistent with contemporary agroecological approaches that place communities at the heart of sustainable food systems.

Nevertheless, these indigenous practices face serious threats due to modernization pressures, the lack of systematic scholarly documentation, and insufficient policy support for the preservation and advancement of traditional knowledge. Still, promising opportunities lie ahead, particularly through culturally grounded local education and multi-sector collaboration involving governments, academic institutions, and indigenous communities. The traditional post-harvest practices of the Muna people are not only essential for cultural preservation and food security but also offer an alternative model for building more sustainable and resilient agricultural systems in the face of climate change and globalization. Therefore, strategic efforts are needed to recognize, further study, and integrate these practices into national sustainable agriculture policies and development programs in Indonesia.

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