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Seasonal Calendars of Identified Barangays Cultivating Traditional Upland Rice Varieties (TURVs) in the Selected Municipalities of the Third District of Iloilo City, Philippines

التقويمات الموسمية للبارانغيات المحددة التي تزرع أصناف الأرز المرتفع التقليدية في بلديات مختارة من المقاطعة الثالثة لمدينة إيلويلو، الفلبين.

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Abstract

This study examined the seasonal calendars of identified upland barangays cultivating Traditional Upland Rice Varieties (TURVs) in the selected municipalities of the 3rd District of Iloilo City, Philippines. TURVs are not only repositories of genetic diversity but also hold the cultural symbols interwoven with indigenous farming knowledge and practices. Seasonal calendars, unlike standardized civil calendars, rely on ecological cues such as rainfall, plant flowering, animal behavior, and lunar cycles to synchronize farming activities. Using the Participatory Rapid Appraisal (PRA) tool of the FAO, structured focus group discussions were conducted across municipalities to document seed systems, land preparation, sowing, crop management, harvesting, and post-harvest practices. Results revealed shared temporal patterns across barangays, with seed activities during the dry season (January–April), land preparation and sowing aligned with the onset of rains (March–June), and harvesting/post-harvest extending to November. However, variations emerged due to microclimatic conditions, elevation, and local resource availability. In municipalities such as Calinog, certain barangays displayed surplus-oriented production with limited market engagement, while others remained largely subsistence-based. The findings highlight the adaptive capacity of upland communities, the centrality of seasonal calendars in ecological and cultural sustainability, and the importance of integrating indigenous knowledge into agricultural policy and rural development strategies.

Keywords: traditional upland rice, seasonal calendar, indigenous knowledge, Iloilo, sustainable agriculture.

الملخص:

فحصت هذه الدراسة التقويمات الموسمية لأنواع المرتفعات المحددة التي تزرع أصناف أرز المرتفعات التقليدية (TURVs) في البلديات المختارة في المنطقة الثالثة من مدينة إيلويلو بالفلبين. فالبرامج التطبيقية الإقليمية ليست مستودعات للتنوع الجيني فحسب، بل إنها تحمل أيضا الرموز الثقافية المتشابكة مع المعارف والممارسات الزراعية للشعوب الأصلية. تعتمد التقويمات الموسمية، على عكس التقويمات المدنية الموحدة، على الإشارات البيئية مثل هطول الأمطار وإزهار النباتات وسلوك الحيوانات والدورات القمرية لمزامنة الأنشطة الزراعية. وباستخدام أداة التقييم السريع التشاركية التي وضعتها منظمة الأغذية والزراعة، أجريت مناقشات جماعية مركزة على نطاق البلديات لتوثيق نظم البذور، وإعداد الأراضي، والبذر، وإدارة المحاصيل، والحصاد، وممارسات ما بعد الحصاد. كشفت النتائج عن أنماط زمنية مشتركة عبر barangays، مع أنشطة البذور خلال موسم الجفاف (يناير–أبريل)، وإعداد الأراضي والبذر بما يتماشى مع بداية هطول الأمطار (مارس–يونيو)، والحصاد/ما بعد الحصاد الممتد حتى نوفمبر. ومع ذلك، ظهرت اختلافات بسبب الظروف المناخية الدقيقة والارتفاع وتوافر الموارد المحلية. في بلديات مثل كالينوغ، عرضت بعض barangays إنتاجا موجها نحو الفائض مع مشاركة محدودة في السوق، بينما ظل البعض الآخر قائما على الكفاف إلى حد كبير. وتسلط النتائج الضوء على القدرة التكيفية لمجتمعات المرتفعات، والأهمية المركزية للتقويمات الموسمية في الاستدامة الإيكولوجية والثقافية، وأهمية إدماج معارف الشعوب الأصلية في السياسات الزراعية واستراتيجيات التنمية الريفية.

الكلمات الرئيسية: أرز المرتفعات التقليدي، التقويم الموسمي، معارف السكان الأصليين، إيلويلو، الزراعة المستدامة.

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INTRODUCTION

According to Nagal (2025), traditional upland rice varieties (TURVs) are more than repositories of genetic diversity and expressions of food sovereignty; they are living symbols of cultural heritage, deeply interwoven into indigenous agricultural systems. Magdalene (2025) reinforces this view, noting that the cultivation and preservation of TURVs are inseparable from communities' cultural identity and ancestral practices.

Hutchins III (2024) further underscores their dual cultural and ecological importance, observing that TURVs sustain livelihoods, ceremonial traditions, and agroecological resilience. In this sense, TURVs function not only as biological assets but also as vehicles for cultural transmission and environmental stewardship. Birahi (2023), in the context of the Sustainable Development Goals (SDGs) in SAARC countries, stresses that the continuity of TURV cultivation relies heavily on localized knowledge systems developed over generations. One of the most enduring of these systems is the seasonal calendar, a culturally embedded and ecologically responsive framework that synchronizes farming practices with natural rhythms (Samarasekara Witharana, 2023).

Unlike fixed civil calendars, seasonal calendars are grounded in ecological indicators such as lunar phases, rainfall onset, temperature shifts, flowering of plants, animal behavior, insect emergence, and tidal cycles (Chambers et al., 2021). Smith et al. (2023) explain that these cues are interpreted through generations of accumulated experiential knowledge, forming a context-sensitive system of agricultural timing. These calendars, therefore, function not only as scheduling tools but also as embodiments of adaptive intelligence rooted in long-term ecological observation.

In upland agricultural contexts with limited access to modern forecasting tools and inputs, seasonal calendars assume particular importance. Studies by Weltzin et al. (2020) and Filho et al. (2023) affirm that they enable precise decisions in land preparation, sowing, fertilization, pest control, and harvesting, even without formal meteorological data. This role is especially critical for TURVs, whose cultivation depends on timing strategies attuned to their growth characteristics. Nyamekye et al. (2021) emphasize that upland farmers rarely follow rigid planting schedules, but instead rely on biophysical signs that align with the ecological needs of each variety. Similarly, Wang et al. (2022) and Muralikrishnan et al. (2021) note that this traditional timing accommodates traits such as photoperiod sensitivity, drought resistance, and flowering synchrony, thereby enhancing resilience, maintaining varietal integrity, and supporting long-term sustainability.

Beyond agronomy, seasonal calendars are embedded in the socio-cultural and spiritual fabric of indigenous farming. Bhattacharya and Panda (2024) describe how stages such as planting and harvesting are tied to rituals, taboos, and communal ceremonies. These practices reflect a worldview that frames farming as a co-creative act between humans, nature, and spiritual forces. Such a perspective fosters ecological responsibility, reverence for the land, and collective identity within upland communities.

Despite the spread of modern technologies, hybrid seed systems, and climate variability, seasonal calendars remain relevant in upland and indigenous farming systems (Gowdy, 2020; Lokho et al., 2022; Venning & Bushaka, 2024). However, while African contexts have been extensively documented (Omran, 2020), little is known about how Filipino upland farmers use seasonal calendars to guide TURV cultivation. This gap is significant because understanding the interplay between seasonal calendars and TURV farming in the Philippines could inform local conservation efforts, climate adaptation strategies (Knorr & Agustin, 2025; Galappaththi & Schlingmann, 2023), seed sovereignty initiatives (Lovell et al., 2021), and the sustainability of traditional food systems (Marrero & Mattei, 2022). As Imoro et al. (2021) emphasize, indigenous knowledge systems offer holistic, context-specific responses to ecological variability, making them invaluable in shaping culturally respectful and ecologically sound agricultural policies.

METHODOLOGY

This study employed a qualitative-descriptive research design utilizing the Participatory Rapid Appraisal (PRA) framework developed by the Food and Agriculture Organization (FAO). This approach was chosen to effectively capture and document farmers' indigenous knowledge, seasonal patterns, and adaptive strategies in upland rice cultivation. The research was conducted in selected upland barangays across five municipalities of the 3rd District of Iloilo, namely Cabatuan, Calinog, Janiuay, Lambunao, and Maasin. These areas were identified as traditional upland rice-producing zones with diverse agroecological conditions.

Participants in each municipality varied as reflected in Table 1, and 20 farmers per municipality were purposively selected based on their active involvement in cultivating Traditional Upland Rice Varieties (TURVs). The sample size was deemed adequate to ensure diverse yet manageable representation across gender, age, and farming experience while allowing for in-depth group discussions and consensus-building. A total of five focus group discussions (FGDs) were conducted, one in each municipality, to ensure local representation and contextual relevance of responses.

Data were collected through FGDs guided by ten structured questions focusing on monthly farming activities, which covered climate observation, seed exchange and management, land preparation, sowing/planting, weeding, fertilization, pest and disease control, harvesting, post-harvest practices, and marketing.

Each session was facilitated in the local dialect to encourage open and active participation. Notes, audio recordings, and visual outputs (seasonal calendars) were documented, with farmers collaboratively constructing and validating the seasonal calendars during the sessions. Prior to data collection, approval was sought from the institutional research ethics committee. Informed consent was obtained from all participants after explaining the study’s purpose, procedures, and voluntary nature.

Participants were assured that their contributions would remain confidential, with no personal identifiers included in reports or publications. They were also informed of their right to withdraw at any stage without penalty. Throughout the process, respect for indigenous knowledge, local traditions, and cultural sensitivity was strictly observed. To ensure data trustworthiness, several validation techniques were employed. The seasonal calendars and interpretations were subjected to member checking, wherein results were presented to participants for confirmation, clarification, and correction after each FGD. Triangulation was also applied by cross-referencing farmers’ narratives with secondary data, including agricultural extension reports and relevant literature on upland rice practices in the region.

For qualitative data analysis, all FGD transcripts and notes were transcribed and analyzed using thematic analysis. Initial coding was conducted to identify recurring concepts and practices, which were then grouped into themes reflecting major categories of upland rice management. Patterns and variations across municipalities were examined to highlight shared indigenous knowledge and location-specific adaptive strategies. The consolidated and color-coded seasonal calendars visually represented the timing of major farming activities, enabling comparative interpretation of temporal and ecological variations. The analyzed results were interpreted to underscore the vital role of indigenous agricultural knowledge, collective memory, and adaptive strategies in sustaining upland rice production under diverse ecological and socio-cultural conditions.

RESULTS AND DISCUSSION

Distribution of Upland Rice Farmers across Municipalities

Table 1. Profile of Municipalities based on the Number of Barangays and Interviewed Farmers

Municipalities	No. of Barangays	Percentage	No. of Farmers	Percentage
Cabatuan	6	16.22	27	1.40
Calinog	13	35.14	1031	53.28
Janiuay	7	18.92	581	30.03
Lambunao	6	16.22	196	10.13
Maasin	5	13.51	100	5.17
Total	**37**	**100.00**	**1935**	**100.00**

The data show that the distribution of upland rice farmers in the 3rd District of Iloilo City is uneven across municipalities and barangays (Table 1). **Calinog** has the highest representation, with 13 barangays (35.14% of the total) and 1,031 farmers (53.28%), indicating that over half of the surveyed upland rice farmers are concentrated in this municipality. This suggests that Calinog serves as a central hub for the **proliferation, cultivation, and domestication of traditional upland rice varieties**. The aforementioned area highlights its pivotal role in terms of geographical size, maintaining agrobiodiversity, and community-based seed systems (Gauchan and Shrestha, 2020).

It is followed by **Janiuay** with 7 barangays (18.92%) and 581 farmers (30.03%), reflecting a substantial farming population, though concentrated in fewer barangays. **Cabatuan** and **Lambunao** each contribute six barangays (16.22%), but the number of farmers differs markedly—27 farmers (1.40%) in Cabatuan versus 196 farmers (10.13%) in Lambunao—indicating variations in the intensity and scale of upland rice cultivation per barangay. **Maasin** has the fewest barangays (5, 13.51%) and farmers (100, 5.17%), suggesting smaller-scale or more scattered cultivation in this municipality.

The patterns reveal both the **spatial clustering of upland rice farming** and the **heterogeneity in farmer density**, likely influenced by factors such as land availability, microclimatic conditions, soil fertility, and historical agricultural practices (Molla et al, 2022). The high concentration of farmers in Calinog and Janiuay underscores the importance of prioritizing these municipalities for interventions aimed at **enhancing seed sovereignty, conserving agrobiodiversity, and strengthening market access**, as these areas represent the core communities actively maintaining Traditional Upland Rice Varieties (TURVs) and associated cultural practices.

Municipality of Cabatuan

As shown in Figure 1, the seasonal calendar of Cabatuan reflects a dynamic cycle of climatic shifts from predominantly sunny periods at the start of the year, transitioning into months characterized by alternating sunny and rainy conditions, and eventually returning to a drier climate. In correlation with the findings of Unuigbe (2025) in Africa, farmers in Cabatuan align their cropping and seed system practices with these climatic rhythms, demonstrating adaptive strategies deeply rooted in local knowledge and long-term experiential learning. Seed-related activities commence in April and May, coinciding with the onset of the rainy season. During this period, farmers engage primarily in seed exchange within their community. The absence of seed barter or formal seed marketing, as observed by Vernooy et al. (2022), indicates that seed access and renewal remain confined to local social networks rather than formal markets. This localized reliance reinforces social cohesion and collective resilience but may simultaneously constrain genetic diversification and limit access to improved varieties—potentially reducing adaptive capacity under increasingly variable climatic conditions.

Land preparation and planting typically occur between April and June, strategically synchronized with increasing rainfall and optimal soil moisture. This timing exemplifies a climate-smart approach that ensures proper seedling establishment before the onset of peak rainfall. Subsequent field operations such as weeding, fertilization, and pest management are flexibly scheduled based on real-time weather observations, indicating that farmers manage climatic uncertainty through experiential learning and adaptive decision-making. As highlighted by Samarasekara Witharana (2023), this adaptability underscores the enduring value of traditional ecological knowledge in sustaining upland rice cultivation under unpredictable environmental conditions.

Harvesting occurs mainly in August, followed by post-harvest processing in September and October. This sequence not only avoids typhoon-prone months but also ensures that grains are dried under favorable conditions, thereby preserving seed quality for subsequent planting. This practice of seed conservation, preservation, and regeneration forms a vital component of the community's adaptive strategy, serving both ecological and cultural functions (Wambugu et al., 2023). By maintaining a self-sustaining seed cycle, farmers safeguard the genetic integrity of traditional upland rice varieties (TURVs) that are uniquely adapted to local soil and climate conditions, as emphasized by Thakur et al. (2024).

Furthermore, Teixidor-Toneu et al. (2023) stress that these practices reinforce intergenerational knowledge transmission, where seed selection and storage methods are guided by the wisdom and collective experience of community elders. Such continuity fosters on-farm conservation, as advocated by Mathew and Mathew (2023), ensuring that valuable landraces remain viable amidst environmental change and the growing dominance of commercial hybrids. Thus, the post-harvest phase functions not merely as a technical operation but as a cornerstone of ecological resilience, cultural identity, and food sovereignty within Cabatuan's upland rice farming systems. However, the absence of structured seed marketing and external linkages may pose challenges to the long-term sustainability of traditional upland rice varieties. As pointed out by Khoury et al. (2022), the lack of formal seed distribution channels restricts varietal circulation, making the system vulnerable to genetic erosion in cases of crop failure or farmer migration. Strengthening community seed networks through participatory breeding initiatives, seed fairs, and localized seed banks - as proposed by

Louwaars and Manicad (2022) - could bolster both the adaptive capacity and economic sustainability of these upland rice systems.

Together, the cropping calendar of Cabatuan represents far more than a routine agricultural schedule. It embodies a resilient and culturally grounded production system that harmonizes ecological timing, risk avoidance, and community cooperation. In essence, the seasonal and seed management patterns observed reflect a delicate balance between cultural continuity and ecological pragmatism. While synchronization with climatic cycles enhances production stability, diversifying seed access and expanding adaptive strategies could further secure the resilience and persistence of traditional upland rice varieties amid the challenges posed by climate variability.

Municipality of Lambunao

The seasonal farming calendar in Lambunao is closely aligned with the municipality's variable climate, which alternates between sunshine, rainfall, and intermittent cloudiness. Seed-related activities such as cleaning, selection, classification, and land preparation typically begin in February and extend through May, ensuring readiness for the wet season. This preparatory phase reflects farmers' anticipation of shifting weather conditions and their reliance on ecological cues, such as rainfall onset and soil moisture changes - to guide the timing of agricultural operations.

This synchronization underscores the depth of local environmental knowledge and the farmers' adaptive capacity in managing the unpredictability of upland microclimates (Witharana et al., 2025).

Planting generally begins in late April and continues through June, coinciding with the onset of early rains that ensure adequate soil moisture for seed germination and early seedling establishment. This practice exemplifies climate-responsive decision-making, minimizing drought-related risks during the initial growth stages. Such adaptive timing is consistent with the findings of Galacgac and Balisacan (2009), who observed similar climate-based planting adjustments in agroforestry systems of Ilocos Norte, Philippines.

Crop management operations—such as weeding, fertilization, and pest control—are undertaken between May and July, with notable intensity in barangays like Jayubo, where topographic and microclimatic variations demand greater labor input and resource allocation. This spatial differentiation implies that while adaptive strategies are shared across Lambunao, their implementation varies according to local ecological constraints. Marginal areas with steeper slopes and erratic rainfall require more flexible management approaches and stronger reliance on traditional ecological indicators to sustain productivity, a pattern also emphasized by Li and Han (2022) in their analysis of smallholder adaptation to landscape heterogeneity.

Harvesting typically occurs between August and October, coinciding with the tapering of rainfall and the physiological maturity of the crop. Post-harvest operations such as drying, threshing, and storage follow immediately, ensuring the preservation of grain quality and seed viability for the next planting cycle. These post-harvest practices represent an embedded form of risk management: by timing drying and processing during drier months, farmers reduce post-harvest losses and maintain both food and seed security. The cyclical and self-sufficient nature of these activities reinforces what Subroto and Ningrum (2020) identified as a defining feature of upland farming systems—autonomy in production and resource conservation, which sustains the long-term stability of traditional rice cultivation in Lambunao.

Unlike in more market-integrated agricultural areas, Lambunao’s farmers rely primarily on community-based seed exchange rather than formal seed trade or external sourcing. Westengen et al. (2023) emphasized that while such systems strengthen social cohesion and preserve local genetic diversity, the absence of structured seed marketing limits opportunities for genetic enrichment and technological innovation. Over time, this could reduce the community’s ability to respond to emerging climatic and pest pressures, potentially narrowing the genetic base of traditional upland rice varieties (TURVs).

The observed variations across barangays—where some farmers engage actively in informal seed sharing while others depend on retained germplasm—reflect differing levels of resource access, environmental exposure, and adaptive capacity. In this context, the seasonal calendar of Lambunao represents far more than a schedule of agricultural activities—it embodies a locally attuned strategy for managing environmental uncertainty, fostering social cooperation, and maintaining seed system continuity. Strengthening linkages between traditional and formal seed systems—through participatory breeding programs, farmer-led seed fairs, and community-based seed banks—could further enhance Lambunao’s adaptive potential while ensuring the long-term sustainability of its TURVs. Ultimately, the farming practices observed in

Lambunao illustrate how ecological knowledge, community reciprocity, and environmental awareness converge to sustain both livelihoods and biodiversity under the realities of a changing climate.

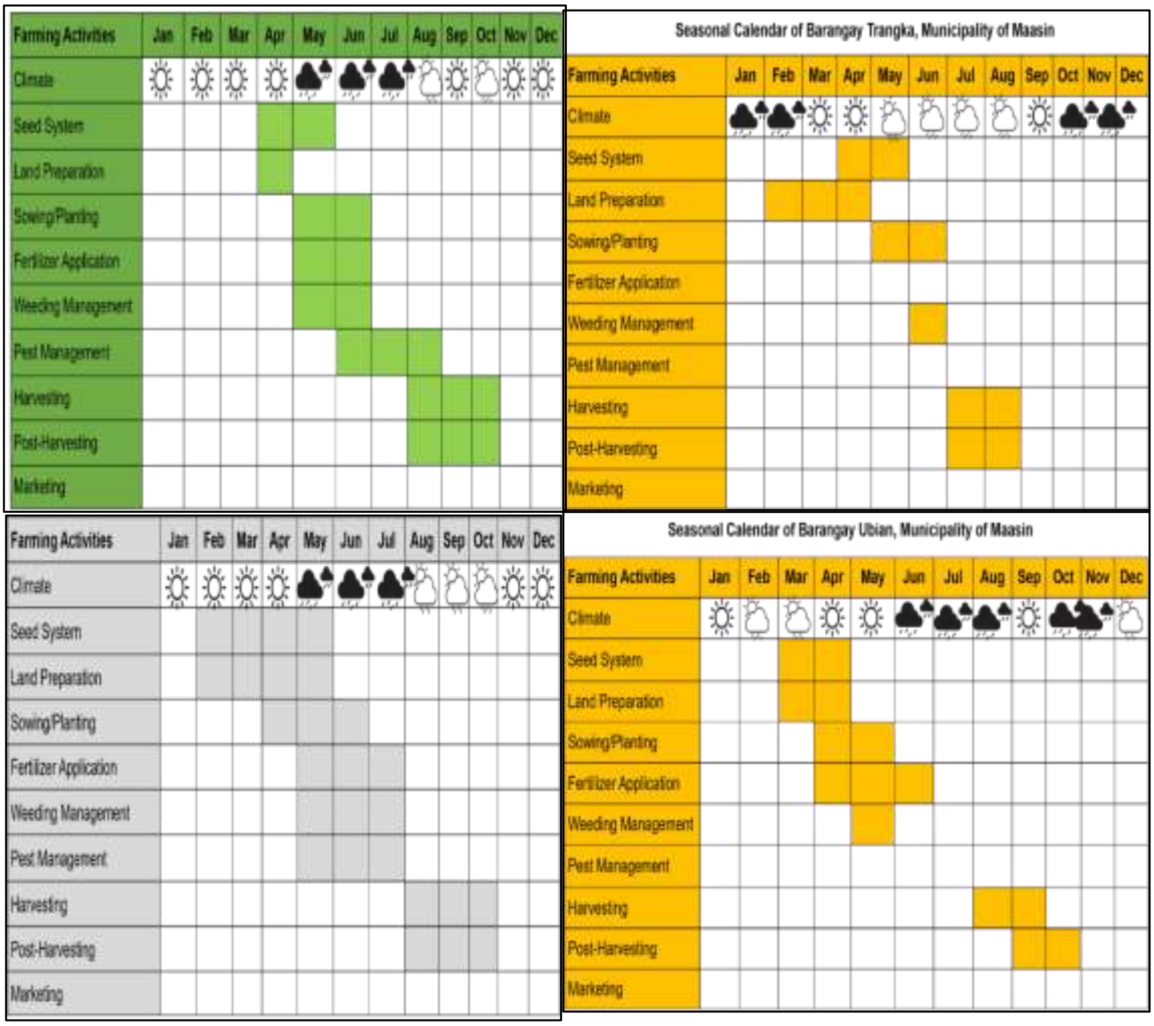

Figure 1. Seasonal Calendar of Cabatuan (green), Lambuanao (grey), and Barangay Trangka and Ubian of the Municipality of Maasin.

Figure 2. Seasonal Calendar of TURVs for the Barangay Aglonok, Binolosan Grande, Binolosan Pequenio, Caratagan, Cahigon, Garangan, Guinbunyogan, and Hilwan, Municipality of Calinog.

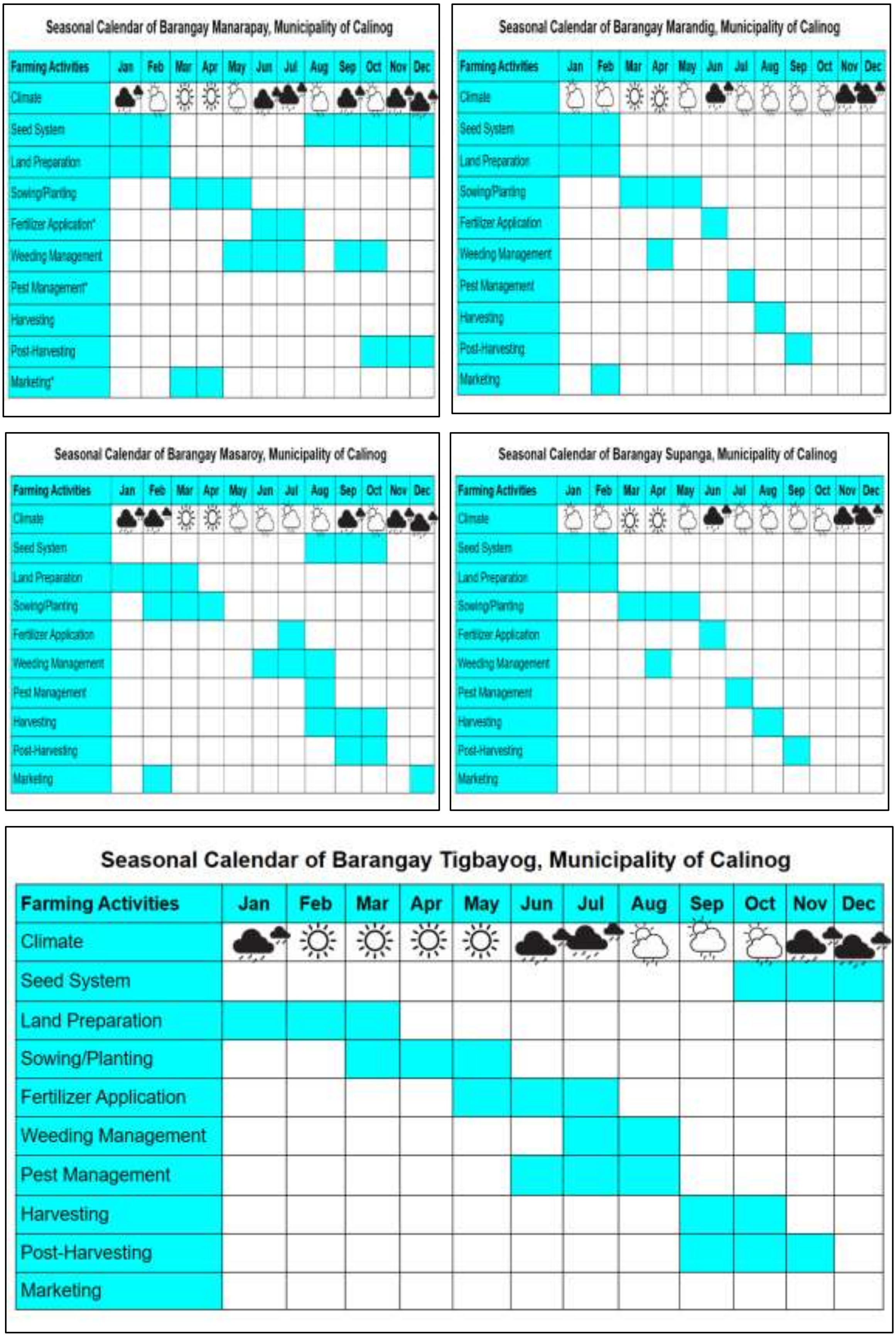

Figure 3 Seasonal Calendar of TURVs for the Barangay Manarapay, Marandig, Masaroy, Supanga, and Tigbayog, Municipality of Calinog.

Figure 4. Seasonal Calendar of TURVs for the Barangays of Aglobong, Atimonan, Barasalon, Canauillian, Monte-Magapa, Panuran, and Quipot in the Municipality of Janiuay.

Municipality of Maasin

The seasonal calendar of upland rice farming in the Municipality of Maasin highlights the profound role of indigenous knowledge systems and adaptive ecological management among traditional upland rice growers. With more than fifty farmers cultivating heirloom varieties, these communities sustain time-tested practices finely attuned to local environmental rhythms. The observed variations in cropping cycles between Barangays Trangka and Ubian reflect localized adaptation to microclimatic conditions, topography, and resource availability—demonstrating that adaptive capacity in upland farming is deeply rooted in traditional knowledge rather than dependent on external technological inputs.

In Barangay Trangka, the synchronization of land preparation and sowing with early rainfall (February–June) represents a strategic adaptation to limited soil moisture before the onset of heavy rains. The absence of chemical fertilizers and reliance on organic soil fertility management underscore both economic constraints and a cultural preference for natural farming systems. In line with Daifa et al. (2024), such practices cultivate abundance through harmony with natural processes. While ecologically sustainable, this approach may constrain yield potential due to limited access to agricultural inputs and institutional support. As suggested by Sekhar et al. (2024), integrating organic and inorganic farming techniques could enhance productivity without compromising traditional practices. The lack of a defined marketing period indicates a subsistence-oriented production system, where rice primarily serves as a household staple and cultural resource rather than a commercial commodity. Consistent with Fristin and Supanto (2021), this self-sufficiency strengthens food security but limits opportunities for income diversification and the long-term economic sustainability of upland rice cultivation.

In contrast, Barangay Ubian exhibits a slightly delayed cropping cycle, with planting and harvest activities extending into the later rainy season (May–September). These shifts, influenced by elevation and microclimate, illustrate farmers' capacity to fine-tune planting schedules to optimize moisture availability and reduce risks from erratic rainfall, corroborating findings by Mpala and Simatele (2024) in Masvingo, Zimbabwe. The modest introduction of fertilizer application indicates emerging hybrid practices, where traditional systems are cautiously integrated with modern inputs to improve productivity. As noted by Colloff et al. (2021), such transitional strategies balance ecological sustainability with yield improvement, representing a promising pathway for adaptive innovation.

The contrasts between Trangka and Ubian reveal that adaptive capacity in Maasin's upland communities is context-specific and dynamic. Farmers rely not on formal extension services but on accumulated experiential knowledge transmitted across generations. However, the absence of structured market engagement in both barangays raises concerns about the long-term sustainability of these traditional systems. Without viable marketing channels or value-adding mechanisms, as observed among heirloom rice growers in the Philippines (Britwum and Demont, 2024), farmers remain economically vulnerable and may eventually abandon heirloom rice cultivation in favor of more profitable alternatives. Overall, the seasonal calendar of Maasin underscores the resilience of traditional upland rice systems as socio-ecological constructs that integrate livelihood, culture, and environmental stewardship. The persistence of these calendars reflects both the adaptive strengths and vulnerabilities of indigenous agricultural practices—robust in maintaining food sovereignty, yet susceptible to economic marginalization in the context of a rapidly modernizing agricultural landscape.

Municipality of Calinog

The seasonal calendar of upland rice farming in Calinog demonstrates the integration of indigenous knowledge, ecological awareness, and adaptive management among local farmers. Seed-related activities commence between February and April, followed by land preparation from March to May, timed to precede the rainy season. Planting typically occurs from May to July, coinciding with early rains to ensure sufficient soil moisture for crop establishment. Crop management practices—including weeding, fertilization, and pest control—are concentrated from June to August, aligning with the vegetative stage to optimize growth. Harvesting occurs from September to November, when crops reach maturity and rainfall declines, while post-harvest operations extend into October to December, taking advantage of drier conditions for effective drying, threshing, and storage.

Although rice production in Calinog primarily serves household consumption, some barangays—such as Binolosan Grande, Caratagan, Guinbunyogan, and Tigbayog—engage in limited marketing of surplus produce. This partial commercialization indicates emerging opportunities for income generation, yet it also highlights constraints in marketing infrastructure, storage facilities, and access to broader markets (Mataia et al., 2020). Variations across barangays, including extended sowing and post-harvest periods in Manarapay and Tigbayog or the earlier adoption of fertilizer application and pest management in Masaroy, underscore context-specific adaptive strategies.

As noted by Vala et al. (2024), such adjustments reflect responses to microclimatic differences, soil conditions, and resource availability, illustrating how ecological intelligence and localized experimentation are essential for sustaining productivity and mitigating risk.

The diversity in farming practices across barangays further illustrates the **dynamic adaptive capacity** of Calinog's upland rice communities. Farmers rely on accumulated experiential knowledge rather than formal extension services to adjust cropping schedules and management practices (Prajapati et al., 2025). However, the limited commercialization of rice and the absence of structured marketing systems in most areas may constrain the long-term economic sustainability of traditional upland rice varieties (Kumar et al., 2022). As Ray (2023) emphasizes, without improved market linkages, farmers may lose the incentive to maintain heirloom varieties, potentially leading to the erosion of agrobiodiversity and associated cultural practices.

Overall, Calinog's seasonal calendar exemplifies the resilience of traditional upland rice systems as socio-ecological frameworks that integrate livelihood, culture, and environmental stewardship. Localized adaptations highlight both the strengths and vulnerabilities of these systems—robust in ensuring household food security and ecological balance, yet sensitive to market limitations and broader economic pressures. Targeted interventions, such as enhancing market access, promoting hybrid input strategies, and supporting community-based programs, could strengthen the sustainability and adaptive capacity of Calinog's upland rice farming systems.

Municipality of Janiuay

The seasonal calendar of upland rice farming in Janiuay demonstrates how local farmers synchronize agricultural activities with climatic patterns, particularly the transition from the dry season (February–May) to the rainy season (June–October), with peak rainfall occurring in September and October. Seed-related activities are undertaken from January to April, followed by land preparation from March to May, strategically timed with the early onset of rains. Sowing and planting occur from May to June, ensuring adequate soil moisture for germination, while fertilization and weeding are concentrated from June to August, aligning with the vegetative growth phase.

Pest management practices, although variable across barangays, are most prevalent from July to September, when wet conditions favor pest proliferation. Harvesting commences in September and peaks in October, with some barangays, including Quipot and Canauillian, extending harvest into November.

Post-harvest operations, such as drying, threshing, and storage, take place from October to November, while limited marketing occurs from November to December, primarily to sell surplus produce. The variations observed across barangays reflect **localized adaptation strategies**, demonstrating the farmers' capacity to adjust cropping schedules, crop management, and post-harvest practices in response to microclimatic differences and resource availability. This indicates a high level of **adaptive capacity**, as farmers rely on accumulated experiential knowledge rather than formal extension support to mitigate climate-related risks and optimize yield (Yeleliere et al. 2023). In relation to Leon and Manalo IV (2024), the limited marketing of surplus rice suggests a predominantly subsistence-oriented system, which supports household food security sustainability, and nutrition, but constrains economic returns and long-term sustainability of traditional upland rice varieties (TURVs).

Overall, Janiuay's seasonal calendar underscores the **resilience of traditional upland rice systems** as socio-ecological constructs that integrate livelihood, culture, and environmental stewardship. While farmers demonstrate flexibility and ecological intelligence in responding to local conditions, the minimal engagement in structured markets and value-adding activities exposes these systems to economic vulnerabilities. Strengthening market linkages, improving post-harvest management, and supporting community-based initiatives could enhance both the **sustainability** and **adaptive capacity** of upland rice farming in Janiuay.

CONCLUSION

The seasonal calendars of Traditional Upland Rice Variety (TURV) farming in the 3rd District of Iloilo City reveal a coherent rhythm of agricultural activities closely aligned with climatic cycles. Seed preparation is carried out during the dry months, planting occurs at the onset of rains, and harvesting coincides with the tapering of the wet season. While production remains largely subsistence-oriented, select barangays in Calinog and neighboring municipalities generate surpluses for limited market distribution, reflecting variations in livelihood strategies and resource use (Dambele et al., 2025). Differences in the timing of activities across barangays further illustrate the role of microclimates, elevation, and rainfall patterns in shaping context-specific adaptive strategies (Bhatia et al., 2024).

Beyond their practical utility, these seasonal calendars act as repositories of indigenous knowledge, preserving cultural practices and traditional decision-making processes that underpin seed sovereignty (McKemet et al. 2020).

By maintaining and cultivating traditional, landraces, heirloom rice varieties, upland communities retain control over seed selection, storage, and exchange, thereby safeguarding agrobiodiversity and sustaining locally adapted genotypes and minimizing genetic crop erosion (Sandström et al., 2024; Gauchan & Shrestha, 2020). The persistence of these practices reflects the intertwined nature of ecological and cultural systems - an embodiment of biocultural diversity - and demonstrates the resilience of upland farmers in navigating ecological variability and climate risks (Venning & Bushaka, 2024).

Recognizing and supporting these traditional calendars within extension services and policy frameworks is therefore essential. Integrating local knowledge with modern agricultural support can reinforce food security, promote the conservation of genetic resources, and preserve cultural heritage, while enhancing the adaptive capacity of upland rice farming communities (Chambers et al., 2021; Norton & Alwang, 2020; Nursey-Bray et al., 2022). Ultimately, the findings underscore that sustaining TURVs is not only an agricultural concern but also a matter of cultural and ecological stewardship, linking livelihoods, biodiversity, and community identity in upland landscapes.

RECOMMENDATIONS

This study underscores the significance of seasonal calendars as both ecological and cultural frameworks that sustain the cultivation of Traditional Upland Rice Varieties (TURVs). These calendars enhance farming resilience, reinforce seed sovereignty, and contribute to the conservation of agrobiodiversity. To strengthen these systems, the following recommendations are put forward:

1. **Align agricultural programs with local cropping calendars** to ensure that government interventions such as input distribution, training, and financial support are delivered in harmony with farmers' seasonal activities.

2. **Support and expand community-based seed systems and seed banking** to safeguard local varieties, maintain genetic diversity, and reduce dependency on external seed sources.

3. **Institutionalize indigenous knowledge within agricultural curricula** at both formal and non-formal levels, ensuring that traditional practices are documented, valued, and transmitted to younger generations.

4. **Strengthen local value chains and market opportunities for TURV products**, including post-harvest processing, branding, and niche marketing, to increase farmers' income while preserving cultural identity.

5. **Organize and capacitate upland rice farmer associations or cooperatives** to improve collective action, resource sharing, access to training, and advocacy for supportive policies.

6. **Integrate climate adaptation and conservation strategies** into TURV farming to safeguard these systems from the pressures of climate variability, land-use change, and erosion of traditional practices.

Safeguarding TURV-based farming systems is vital not only for ensuring food security but also for upholding cultural heritage, ecological sustainability, and the resilience of upland communities.

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