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ORIGINAL RESEARCH ARTICLE

Gendered Division of Labor in Traditional Upland Rice Farming Systems in the Selected Municipalities of Third Congressional District of Iloilo

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ABSTRACT

The traditional upland rice cultivation system in the Philippines demonstrates an equilibrium among cultural traditions, ecological adaptation, and gendered divisions of labour. The study was conducted in the five municipalities of the third District of Iloilo, where TURVs are farmed, preserved and connected to their culture. Using a structured criteria and guidelines, on-farm interviews and community consultations, and triangulations were employed from (n = 1,935) respondents. A colour -coded matrix was integrated (men's activities presented in blue cells, women's activities in yellow cells, the joint-task -sharing indicates green cells, and violet cells – not applicable activities). Findings indicated distinct gender-related clusters of labor specialization. Land tillage, fertilization, and pest control remain significantly more male-dominated because they are physical and technically demanding. By contrast, seed system management, sowing or planting, weeding, harvesting, and postharvesting are shared primarily by both genders. Women are active participants in seed selection, storage, processing, and, in some instances, sales and marketing: They actively participate in actions which contribute to household food security and cultural persistence. Evidence of inadequate or informal marketing of upland rice has been drawn from this research and indicates that TURVs depend on subsistence and serve to constitute community life. Gender inclusivity needs to be emphasized and integrated into agricultural research, development planning, and improvement plans. Equitable participation not only reinforces household resistance but also maintains indigenous means of knowledge systems and culturally appropriate interventions suitable to the daily life situations of upland farmer families.

Keywords: *Color-coded matrix, cultural-affinity, seed systems, sustainable upland rice farming, traditional upland rice variety*

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INTRODUCTION

Traditional upland rice cultivation is integrated into the cultural and ecological contexts in rural Philippine communities (Geja and Maphosa, 2023; Acabado and Kuan, 2021). In the third District of Iloilo, upland barangays still grow the classic upland rice TURVs, where farming practices are influenced not only by ecological cycles but also by enduring social structures, particularly gender roles (Steup et al., 2022). Gender-based divisions of labour play a significant role in determining productivity, knowledge generation, family income, and community resilience (Ramirez-Santos et al., 2023; Elias et al., 2023). The extent of it, however, is a topic in which there has been little research, scholarship of this sort, and discussion in the traditional agricultural mainstream is limited.

In marginalized contexts, work is generally carried out by family members, with both male and female members dividing labor amonglabour across steps at different stages of the crop production process (Manalo et al., 2025). Nevertheless, it is not a fair and uniform division of labour between the sexes. Kinkingninhoun Medagbe et al. (2020) elucidated that gender roles within are based on cultural beliefs, physical expectations, customary norms, and even spiritual taboos. Men often undertake physically exhausting tasks, including clearing land, plowing and harvesting (Sarker et al., 2024), while women are generally responsible for food preparation, seed storage, and postharvest rituals (Elbert, 2021).

But the role of women in family development is much broader than fieldwork, as Addai et al. (2021) and Francis (2023) note, and their contributions to decision-making, knowledge exchange, and community organization are likewise important and warrant more research and policy attention. Although migration, modernization, and a slow but steady erosion of traditional ways of working have occurred, gendered labor processes persist in some forms in upland rice-growing societies, though they have shifted (Leder, 2025; Mitra and Rao, 2021).

Grasping these dynamics is critical to developing equitable agricultural (Sekhar et al., 2024) and improvement programs (Barooah et al., 2023), safeguarding indigenous farming knowledge (Makate, 2020), and delivering benefits to both

men and women equally (Njuki et al., 2023). Moreover, documenting lived experiences and contributions from both genders provides insight into resilience strategies of upland communities in responding to environmental and socio-economic transformations (Bridges et al., 2023; Gupta et al., 2022).

Hence, in the backdrop of problems and the development of new technologies in communities, this study sought to explore gender differences in labor across gender groups in the traditional upland rice-farming systems of Iloilo in the third Congressional District. In particular, it identifies the municipality and farmer profiles of the traditional upland rice farmers, (b) the roles of men and women in different stages of rice production, examines the cultural and practical logic behind these divisions, as well as their implications on the sustainability of traditional farming.

MATERIALS AND METHODS

Description of the study area

The research areas were conducted in the third Congressional District of Iloilo Province, especially in the agricultural municipalities of Cabatuan, Calinog, Janiuay, Lambunao, and Maasin, from June to August 2025 (Figure 1). The third District, which is situated in the northwestern and central areas of Iloilo in the Western Visayas (Region VI) and coordinates: 10.9° N, 122.4° E, is included in the total of nine municipalities. The municipalities targeted were selected for their variety of upland rice farmers, where established social structures and gendered divisions of labor (in situ management) still abound. The district contains ecosystems composed of both upland and lowland, with rice farming as an important source of livelihood. For those communities, upland rice farming not only serves a commercial purpose. It is also considered a form of culture, imbued with customary knowledge, rituals, and gender-based labor practices, which constitute the social and economic systems within which most families live and work.

Respondents of the study and criteria for their selection

Based on purposive sampling, the number of traditional upland rice variety (TURV) farmers eligible for the study differed across municipalities. Data on the profile of the TURV farmers were initially requested from the Office of the Department of Agriculture at the Local Government Unit; however, records were scarce or incomplete. It resulted in a secondary enumeration of barangays that are active in cultivating upland rice, revealing the following TURV farmers per municipality: Cabatuan (27), Calinog (1,031), Janiuay (581), Lambunao (196), and Maasin (100), respectively.

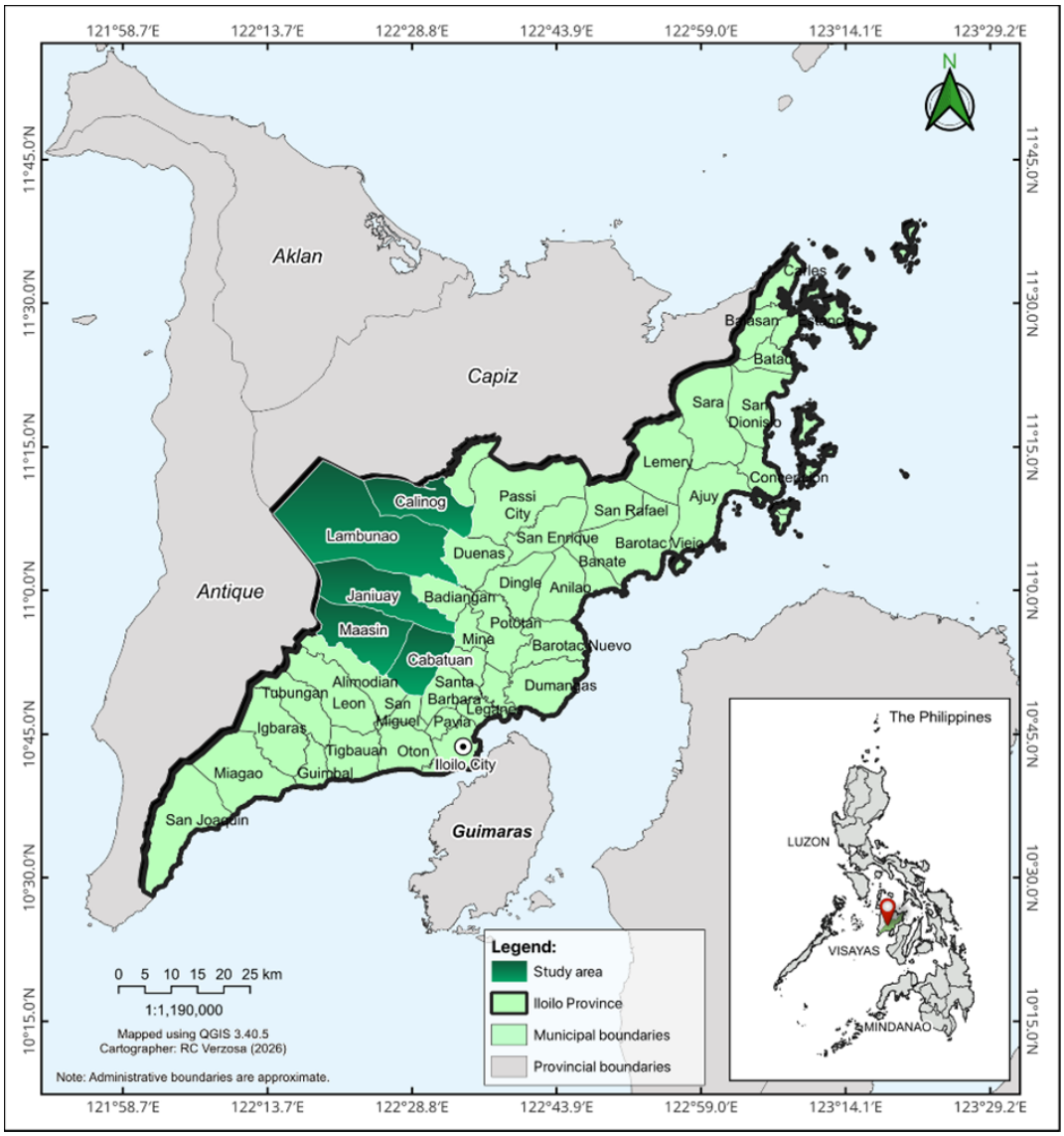

Figure 1. Locale of the study.

Respondents who participated in the study were identified according to the following criteria and guidelines: (1) are involved in traditional upland rice cultivation in the most recent cropping season; (2) are using traditional, or farmer-maintained, upland rice varieties and not purely modern or commercially available cultivars; and (3) are from barangays that have been identified as practicing upland farming systems. The survey included only farmers who met all criteria of selection. Study participation was entirely up to the participants, and informed consent was obtained from all participants prior to data collection. Indigenous Peoples (IPs) were not included in the study because the research was limited to non-Indigenous farmers to ensure a homogenous population, and because conducting such research in the IP communities has special ethical clearances and culturally appropriate methodologies beyond the scope of this study.

Data collection

In this research, data were generated through structured survey questionnaires and community-based forum consultations conducted across five municipalities. A structured research survey questionnaire was administered to traditional upland rice farmers to systematically document the productive roles of men and women at different stages of rice production. In line with the Moser Gender Planning Framework, these activities reflect the productive role domain that deals exclusively with labor contributions which directly contribute to subsistence and agricultural output of families but does not include either reproductive or community responsibilities (which are beyond the immediate scope of the current analysis). The survey instrument underwent content validation by experts in agricultural extension, social sciences, agricultural economics, and research methodology prior to data collection to ensure that the instrument is clear, relevant, and contextually appropriate. This process validated that gender-differentiated roles were well-recorded and consistently interpreted by participants across the study sites.

A total of 1,935 traditional upland rice farmers were identified and interviewed across the five municipalities. To complement and validate the quantitative survey data, community-based forum consultations (CBFCs) (Kumar, 2018) were conducted in each barangay per municipality as indicated in Figure 3. The participants consisted of approximately 40 participants per barangay (consisting of 20 males and 20 females), and were organized with the assistance of barangay officials and local agricultural extension workers of the respective areas. These participative consultations served as a participatory platform where farmers collectively discussed, clarified, and reflected on gender roles in upland rice farming operation from crop establishment to post-harvesting. Unlike focus group discussions (FGD) or key informant interviews (KII), the forum consultations were conducted openly and inclusively, allowing broad community representation rather than segmented or purposively selected participants.

The primary purpose of the community-based forum consultations was to validate survey findings, gather general community feedback from the respondents, and ensure that local perspectives on gender roles in upland rice production were properly acknowledged, integrated, and contextualized. The discussions on this context included gender-based task allocation in farm activities, responses to labor roles, and factors that affected participation in farm activities. To avoid dominance by a few individuals, the facilitator moderated the sessions by allowing one participant to speak at a time and encouraging balanced participation by both groups of men and women. While the research focused on productive roles, community-based forum consultations also provided contextual knowledge around reproductive and community roles. These explanations were utilised to interpret differences in labor participation and workload distribution, fitting with the Moser Gender Planning Framework's holistic view on analysing this phenomenon.

Figure 2. Images showing the documentation of the Community Consultation (CCs) conducted for the gender role assessment in traditional upland rice communities (TURCs) per-barangay sessions of traditional upland rice farmers: (A) Aglobong, (B) Barasalon, (C) Canauillian, and (D) Panuran, Municipality of Janiuay, Province of Iloilo.

Research design and gender framework

A descriptive–qualitative research design rooted in the Moser Gender Planning Framework, a Gender and Development (GAD) analytical approach developed by Moser (2012; 2021). The framework was then selected for its emphasis on the identification of gender roles (i.e., the differentiation of productive, reproductive, and community roles carried out by men and women, as are often used in agricultural and rural sociological development studies) since it offers a systematic perspective to analyze who does what, under what conditions, and why, within farming households and communities. Theoretically, most of the framework was operationalized through its gender roles and division of labor component, which was designed to investigate gendered participation in traditional upland rice-farming systems. The framework informed the development of data-collection instruments, the organizationz of field data, and the interpretation of patterns of gender-based labour across the rice production cycle.

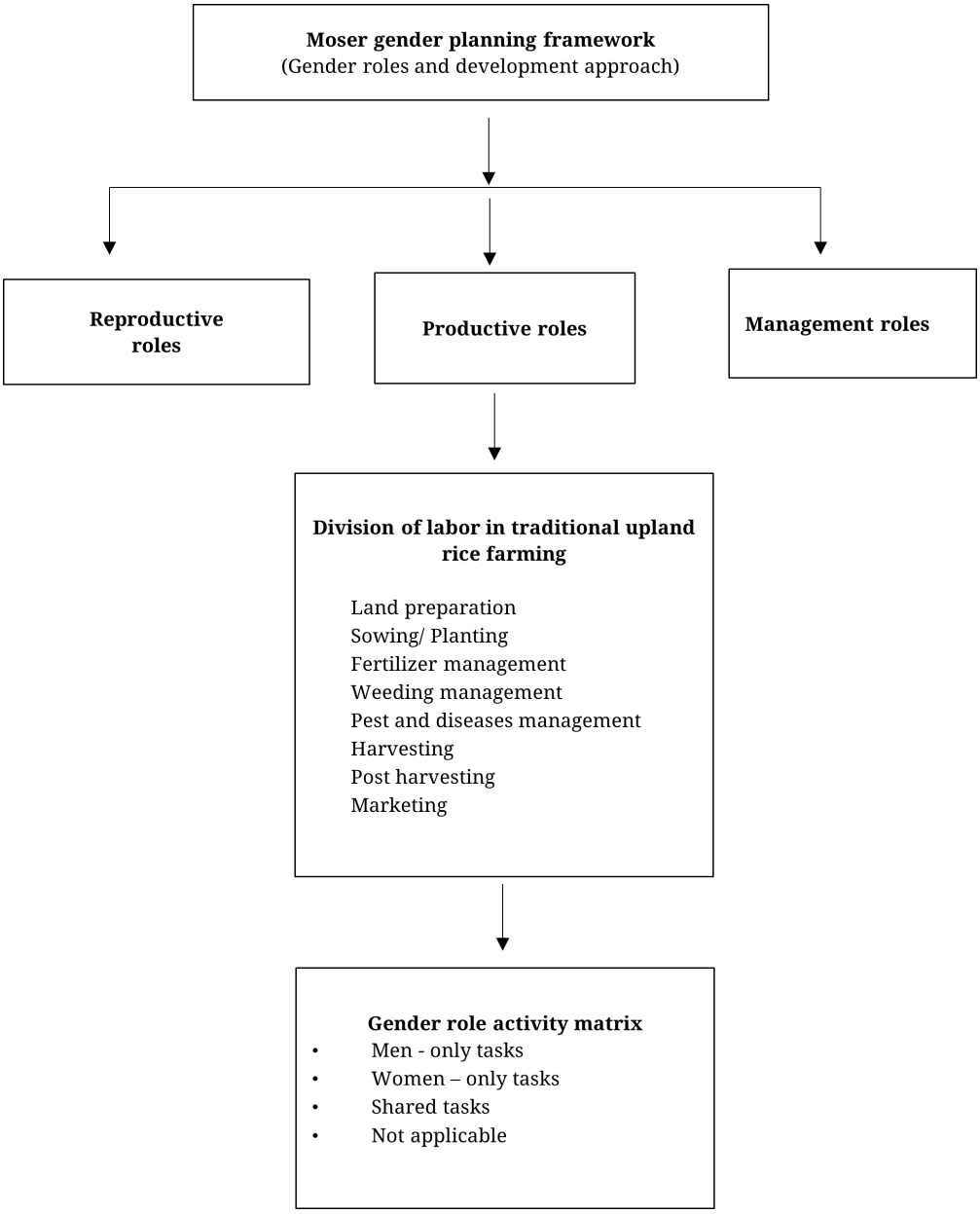

Figure 3. Conceptual framework of the moser gender planning framework applied in the study.

Gender-role activity matrix and analytical framework

The gender-role activity matrix, organized by color and gender, and the Planning Framework (Figure 2) were established as visual and graphic classifications of the agricultural labor force. The Moser framework consists of productive, reproductive and community roles. This research focused primarily on operationalizing productive roles to achieve its primary purpose: analyzing farm-level analyzing labour participation across the principal stages of rice cultivation. The matrix encapsulated the analysis of the roles of gender in the framework by classification of production-related work: blue cells corresponded to work that is performed only by men, yellow cells to work that is performed exclusively by women, green cells to work that both men and women perform, and violet cells to work that does not apply to the local farming context. This task-driven, field-based methodology is suitable for describing productive roles, though the reproductive and

community roles, though conceptually recognized, lie outside the current data collection model.

Data analysis

The data analysis was descriptive–qualitative, and data were generated through structured survey questionnaires and community-based forum consultations (CBFCs) conducted in five municipalities. This analysis of the gendered division of labor in upland rice farming helped expose how men's and women's roles are socially constructed, culturally supported, and enacted at various stages of rice production. The resulting focus on this was an alignment of data collection and analysis, including, but not limited to, types of productive tasks performed, the distribution of labor between women and men, associations with access to resources, and involvement in farm decision-making.

Qualitative results from CBFCs were gathered through transcripts and detailed field notes, which were reviewed for accuracy and completeness. Using Braun and Clarke (2006, 2021) as a guide, an inductive thematic analysis was conducted. This included familiarization, relevant sections, clustering of data by themes (e.g., labor, cultural norms, transfer of knowledge between generations, and adaptive practices), and refinement to ensure consistency in analysis. When these themes were displayed, rather than presented as separate outputs, they were embedded in the narrative discussion to provide context for gender role patterns reflected in the colour-coded activity matrix. Survey responses were descriptively summarized to systematize task performance across the upland rice production process. The gender-role activity matrix served as an analytical tool for visual synthesis, linking quantitative role data with qualitative learning from the CBFCs and, in doing so, allowing comparisons across municipalities. Analytical triangulation was performed by comparing survey findings with those from community-based forum consultations. In this way, convergent findings confirmed the interpretation of existing gender norms, while divergent perspectives suggested dynamics of flexibility, negotiation, and role shifts within farming households. Narrative explanations, grounded in representative community statements, ensured credibility and reflected the lived experiences of traditional upland rice farmers.

RESULTS

Municipality profile

Table 1. Profile of the traditional upland rice municipalities and farmer respondents.

Municipalities	Classification	Land area (ha)	Number of Barangays	TURV Barangays	TURVs Farmers
Cabatuan	Second	8,248	68	6	27
Calinog	First	23,280	59	13	1,031
Janiuay	First	17,910	60	7	581
Lambunao	First	24,692	73	6	196
Maasin	Third	15,658	50	5	100
Total		**89.788**	**313**	**37**	**1,935**

Table 1 shows the profile of municipalities cultivating Traditional Upland Rice Varieties (TURVs) in the third Congressional District of Iloilo based on their land area, their number of barangays, TURV-growing barangays, and their number of farmer respondents. Five municipalities with a total land area of 89,788 hectares included 313 barangays (37 barangays were TURV-growing communities among them). The study's total sample included 1,935 traditional upland rice farmers.

Calinog recorded the highest number of TURV-growing barangays (13) and the largest number of farmer respondents (1,031), accounting for 53.28% of the total sample, among the municipalities. Janiuay followed with seven TURV barangays and 581 respondents (30.03%). Lambunao had six TURV barangays and 196 respondents (10.13%), while Maasin and Cabatuan recorded the lowest participation, with five and six TURV barangays and 100 (5.17%) and 27 (1.40%) respondents, respectively. Although Lambunao had the largest land area (24,692 ha), it did not have the highest number of TURV barangays or farmer respondents. In contrast, Calinog, with a relatively smaller land area (23,280 ha), exhibited the greatest concentration of TURV cultivation and farmer participation. The results indicate a marked spatial variation in the distribution and the intensity of traditional upland rice farming across the municipalities in the district.

The age distribution of traditional upland rice farmers across the five municipalities in the third District of Iloilo City indicates a clear predominance of middle-aged farmers (31–60 years old), who account for 67.60% and constitute an active segment of the farming population, combining physical capacity with accumulated farming experience. Calinog recorded the highest number of farmers in this age bracket (680), followed by Janiuay (425), Lambunao (116), Maasin (70), and Cabatuan (17), reflecting the relative scale of upland rice production across municipalities. Meanwhile, youth participation (under 30 years) remains low at 12.97% of respondents. This indicates that, in recent years, rural youth participation in upland rice cultivation has decreased due to labour intensity, low economic returns, and a preference for off-farm occupations or education. The age structure also affects the distribution of labor, with older farmers doing much of the supervisory and knowledge-intensive work and middle-aged farmers doing most of the physical work. The sample comprised farmers aged 61 years and over, of whom 19.43% were from the municipalities of Calinog (165) and Janiuay (107) (Figure 4A). The persistent engagement of older farmers reflects the significant livelihood and IKS repository role of upland rice farming. However, it also raises questions and intensifies losses related to inter generational succession and long-term sustainability of farming legacies along the slope.

In terms of sex distribution, male farmers outnumbered females by 55.30% and 44.70%, respectively. However, there is a big spread between the TURVs municipalities. The majority of people in Calinog have been male farmers, with 707 males

Socio-demographic profile

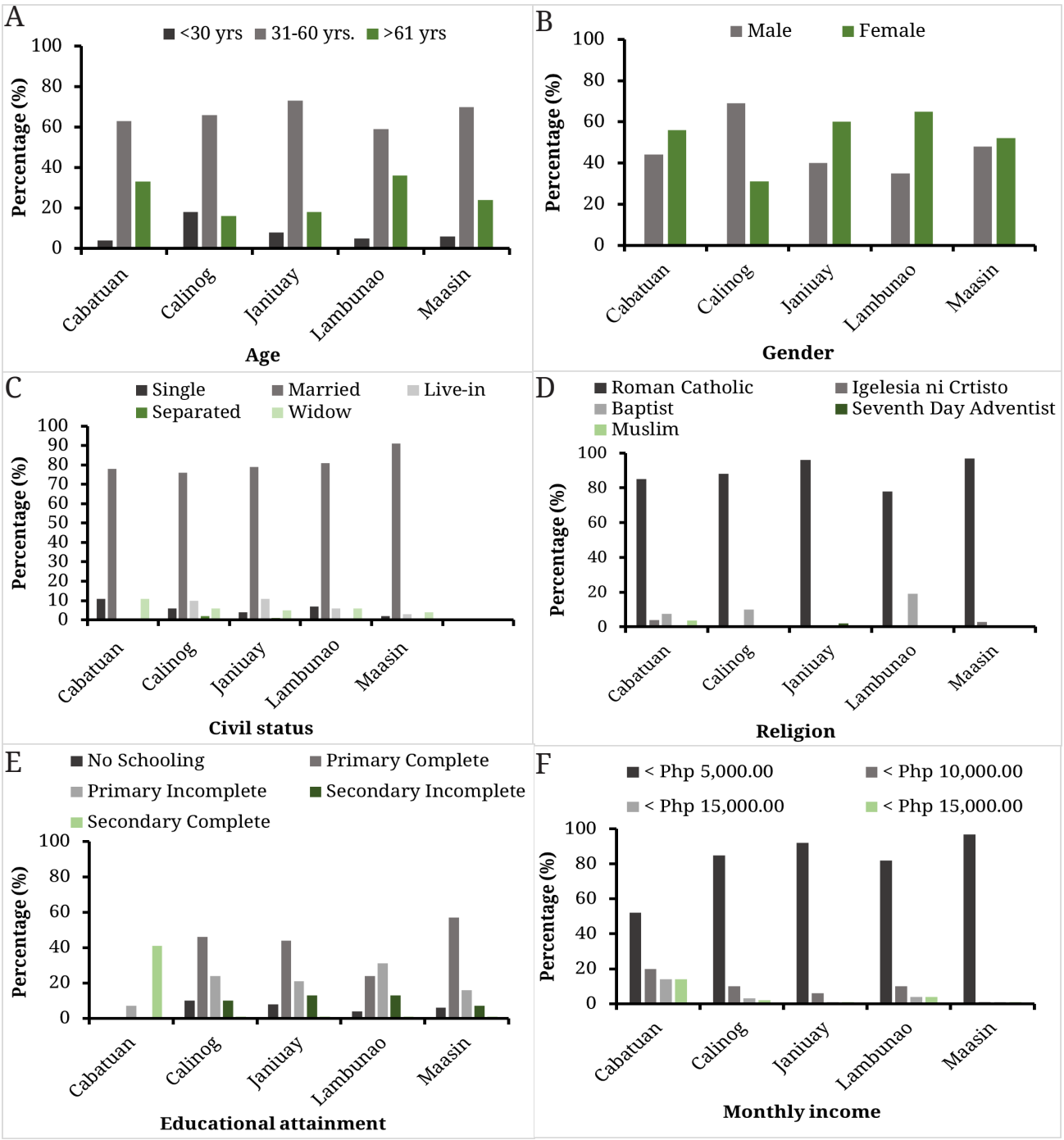

Figure 4. Socio-demographic profile of traditional upland rice farmers across five upland rice municipalities of Cabatuan, Calinog, Janiuay, Lambunao, and Maasin in terms of (A) Age, (B) Gender, (C) Civil status, (D) Religion, (E) Educational attainment, and (F) Monthly income.

compared to 324 females at the population level, indicative of the physically rigorous rural lifestyle and relatively larger farm areas for upland rice farming. Janiuay and Lambunao had higher female participation rates: 347 females vs 234 males in Janiuay, and 127 females vs 69 males in Lambunao. Maasin had a near-equal distribution (48 males and 52 females), while Cabatuan had relatively higher female participation (15 females vs 12 males), despite a smaller sample (Figure 4B).

Regarding civil status, the majority of respondents (78%) were married, suggesting that upland rice farming is primarily carried out at the household level. Live-in and single farmers meaningfully contribute to the ongoing supply of farm labor and to the maintenance of farming knowledge. At the same time, widowed and separated farmers may experience additional labour stress and economic vulnerability, which could also affect farm productivity and governance. There were more married farmers in Calinog and Janiuay than in other areas of the same region, with a high percentage of married farmers (Figure 4C).

Religion-wise, the majority of farmers were Roman Catholics (91%), confirming the majority religious tradition. Fewer minority religious groups existed, such as Baptists (8%) and Iglesia ni Cristo and Seventh-Day Adventists, particularly in Janiuay (D). In addition to the rural communities of upland rice farmers, which contribute to cultural diversity through their seasonallifestyle and collective labor practices, a few Muslim farmers can be identified in Cabatuan and Maasin.

Respondents' education level was generally low to moderate, with the majority having incomplete primary education (42.89%, n = 830) or a primary degree (23.15%, n = 448), most of whom were in Calinog and Janiuay (Figure 4E). A minority obtained vocational, tertiary, or graduate-level education,and this was more evident in Lambunao. This educational profile indicates that although farmers possess some literacy and numeracy skills to survive and thrive in traditional farming, access to information, technology, and organizational ability depends organization of literacy and numeracy they possess. The possession of a profile of traditional upland rice farmers across the five municipalities indicates that the majority are subsistence farmers. Approximately 88% of respondents reported earning less than Php 5,000/month, while a minority reported earning more than Php 5,000/month (Figure 4F). The low-income distribution indicates low market penetration, small-scale farms, and reliance on rainfed production systems.

Municipality of Cabatuan

Table 2. Gender-based division of labor in traditional upland rice farming systems in identified TURV Barangays of Cabatuan Municipality.

Farming activities	Janipaan	Janipaan	Jelicoun	Pacatin	Talanghauan	Tiring
Seed system						
Land preparation						
Sowing/Planting						
Fertilizer management						
Weeding management						
Pest management						
Harvesting						
Post-harvesting						
Marketing						

Legend: Blue – Men; Yellow – Women; Green – Shared activities; Violet – Not applicable.

Most farming activities are performed together in the following six identified TURVs barangays in Cabatuan Municipality: Janipaan Este, Janipaan Central, Jelicuon Montinola, Pacatin, Talanghauan, and Tiring. Among these are seed system management, sowing/planting, weeding, harvesting, and postharvest management. The presence of joint participation throughout these phases suggests a labor-sharing relationship in conventional upland rice production systems. On the other hand, land preparation and fertilizer use are primarily men's domain, as shown by male-only participation.

Pest control activities are also male-oriented across the majority of barangays. There is one such example: Barangay Tiring, which is a men's as well as a women's activity in cultural pest management practices. Marketing activities represent more diversity. The barangay of Talanghauan partners only with women. In contrast, the other barangays show men and women working together in the sale and trade of upland rice. Results of these analyses show that there is a highly cooperative labour structure in TURV production, with both men and women participating at all production cycle stages, as well as task specialization in certain TURV products.

Municipality of Calinog

Table 3. Gender-based division of labor in traditional upland rice farming systems in identified TURV Barangays of Calinog Municipality.

Barangays	Farming activities								
	Seed system	Land. preparation	Sowing/ planting	Fertilizer management	Weeding management	Pest management	Harvesting	Post-Harvesting	Marketing
Aglonok									
Binolosan Grande									
Binolosan Pequenio									
Cahigon									
Caratagan									
Garangan									
Guinbonyugan									
Hilwan									
Manaripay									
Marandig									
Masaroy									
Sunpanga									
Tigbayog									

Legend: Blue – Men; Yellow – Women; Green – Shared activities; Violet – Not applicable.

Table 3 shows that the distribution of gender roles in conventional upland rice farming in the Municipality of Calinog varies by production activity and by barangay. The seed system, as in the large majority of barangays, is jointly husband-wife managed, demonstrating that husbands and wives are involved in early-stage decisions about production. Barangay Aglonok differs from this, as seed system management in the barangay is performed solely by women. Across all barangays, men consistently manage the land preparation. A similar pattern holds in pest management, as male involvement occurs throughout the municipality. Sowing or planting, weeding, harvesting, and postharvest activities are shared among all barangays, with men and women working together; this reflects a common approach to participation in production. Among barangays, gender bias in fertilizer application indicates how fertilizer application varies across barangays. In Cahigon, Gfertilizerlwan, Manaripay, Marandig, and Sunpanga, this is mostly men doing it, whilst in every other barangay, it is common. There are relatively few marketing endeavors for upland rice aimed at rural areas. To date, in many barangays, marketing is not happening, or informal marketing is carried out at the household level. The only areas with male and female participation in marketing are Marandig and Masaroy, whereas Barangay Cahigon has male-only participation. The findings indicate that traditional is characterized by a task-specialized, labor-intensive system, with physically demanding tasks.

Municipality of Janiuay

Table 4. Gender-based division of labor in traditional upland rice farming systems in identified TURV Barangays of Janiuay Municipality

Farming activities	Aglobong	Atimonan	Barasalon	Canawilian	Monte-Magapa	Panuran	Quipot
Seed System							
Land preparation							
Sowing/Planting							
Fertilizer management							
Weeding management							
Pest management							
Harvesting							
Post-Harvesting							
Marketing							

Legend: Blue – Men; Yellow – Women; Green – Shared activities; Violet – Not applicable.

The extent of gender participation in TURV farming in the barangays of Janiuay Municipality is also found to be significant and highly variable, with men and women comprising a higher proportion in nearly all farmers' activities. Seed system operations, such as seed selection, storage, and exchange, are collectively handled by men and women in all barangays. As well as sowing or planting, weeding, harvesting, and postharvest processing, these operations are carried out together by both household patriarchy and matriarchy across the world, showing the joint labour in these important stages. In comparison, land preparation is conducted exclusively by men in all barangays.

Trends in fertilizer and pest management indicate gender parity in use and applicability, but reportability varies across barangays. In Barangay Barasalon, these activities are conducted exclusively by women, indicating their active participation in crop care and farm-level decision-making. Conversely, in Atimonan and Quipot fertilizere and pest management were found to be not applicable; fertilizer classification is consistent only with the non-application of chemical inputs, not with the lack of nutrient and pest management practices; for more traditional, low-input or non-chemical methods that make their way into a household's routine farming activity may be employed. Marketing activities are usually limited. Marketing is hardly reported or practised in most barangays. Agbobong and Panuran report joint male and female involvement in marketing activities on traditional upland rice.

Municipality of Lambunao

Table 5. Gender-based division of labor in traditional upland rice farming systems in identified TURV Barangays of Lambunao Municipality

Farming activities	Agsirab	Bagongbong	Caguisanan	Jayubo	Panurun	Tampucao
Seed system						
Land preparation						
Sowing/Planting						
Fertilizer management						
Weeding management						
Pest management						
Harvesting						
Post-Harvesting						
Marketing						

Legend: Blue – Men; Yellow – Women; Green – Shared activities; Violet – Not applicable.

Seed systems have been dominated by women in the Municipality of Lambunao, which are maintained in all barangays. Land preparation occurs exclusively through men in each barangay. During these production stages, both men and women are involved in activities such as sowing/planting, weeding and harvesting, indicating joint labor participation in fertilizers. The application of fertilizer varies among barangays. This is not practiced in Agsirab, Panuran and Tampucao, at least not where fertilizer application is concerned, while in other barangays, where fertilizer is made, that is mainly by men.

Pest management is also inconsistent. In Agrisab, Bagongbong, and Caguisanan, there is no evidence of pest management practice. On the other hand, in Jayubo, Panuran, and Tampucao, men are solely engaged in pest management. It is also noted that marketing activities are not applicable to all barangays. Hence, no commercial selling or trading of upland rice existed in the municipality. A clear gender-based specialization in women-dominant seed systems, with men handling land and input-related activities.

Municipality of Maasin

Table 6. Gender-based division of labor in traditional upland rice farming systems in identified TURV Barangays of Maasin Municipality.

Farming activities	Cabangcalan	Dagami	Panalian	Trangka	Ubian
Seed system					
Land preparation					
Sowing/Planting					
Fertilizer management					
Weeding management					
Pest management					
Harvesting					
Post-Harvesting					
Marketing					

Legend: Blue – Men; Yellow – Women; Green – Shared activities; Violet – Not applicable.

Most of the farming activities in the Municipality of Maasin — like seed system management, sowing or planting, weeding, harvesting, and postharvest activities in upland rice are jointly carried out in all six barangays: Cabangcalan, Dagami, Panalian, Trangka, and Ubian. In all barangays, men chiefly prepare the land and apply fertilizer. Aside from fertilizer pest management is carried out through fertilizer practices; otherwise, it is considered unnecessary. All barangays lack marketing activities, suggesting limited involvement in market-oriented rice production. A subsistence-based production system with shared labor throughout cultivation, with specialization of tasks (laborious and technical).

DISCUSSIONS

Municipality profile

Traditional upland rice variety (TURV) farming in the third District of Iloilo is mainly in rainfed, sloping agroecosystems, with less mechanization and greater indigenous knowledge systems than in irrigated lowland systems (Singh and Nath, 2020). This clustering of TURV farmers in Calinog and Janiuay suggests that upland rice cultivation is embedded in discrete agroecological and cultural niches rather than being uniformly distributed. These zones adopt mixed upland cropping systems that combine rice varieties with corn and vegetables adapted to slopes and rain-fed landscape conditions (Pinon, 2022). Upland rice persistence is powerfully conditioned by the interaction among agroecology, tradition, and gendered labour systems (Nyasimi, 2021; Nagal, 2025).

Weak relations between municipal land area and TURV participation, especially in Lambunao, show that land distribution alone may not lead the community to participate in TURV. Instead, climate, slope, soil quality, labor, male-female power relations, and household decision-making have a stronger impact (Huyer, 2016; Soriano Jr. and Herath, 2020). Labor organizations have a part in organizing gender roles. organizationg these principles under the TURV (Calinog, Janiuay) municipalities, men are assigned physically strenuous laboring (land preparation, field maintenance), and women tend to seed selection, transplanting, and postharvest operations (Caron, 2020; Richardson and Roberts, 2020).

Such functions align with the productive role emphasized in the Gender Role Framework and reflect attitudes and generational knowledge transfer from local elders to younger generations. Another organizational modification is where women do domestic work while men align their jobs with household provisioning (Rietveld et al., 2023). Informal networks for seed exchange and collective labor also signal robust community roles (Arintyas, 2024). Conversely, municipalities with fewer TURV farmers (Cabatuan, Maasin) can share labor more flexibly due to workforce constraints related to migration and small household sizes (Bacud et al., 2021). The spatial and social discrepancies underline that municipal-level, gender-sensitive interventions are required to sustain indigenous upland rice systems and encourage equitable agricultural development (Devkota and Prakuryal, 2017).

Socio-demographic profile of the traditional upland rice farmers

Upland rice farming in the district is largely sustained by middle-aged farmers, reflecting dependence on experienced and physically capable practitioners (L'Erario, 2021). Even so, the lack of youth engagement poses a risk for intergenerational knowledge continuity and long-term sustainability of the system (Conway et al., 2021). This concentration of expertise among older farmers highlights the need for youth engagement and succession planning (Chavanon, 2025; Madende et al., 2023; Pitson et al., 2020; Labadi et al., 2021).

Municipalities vary in their gender participation. Male dominance in Calinog reflects labor-intensive systems and larger farms (Yamauchi, 2021), while stronger female participation in Janiuay and Lambunao reflects women's central roles in seed management, crop establishment, harvesting, and local leadership (Bin Duwa Bin Khoja, 2021). Male out-migration further increases the burdens of women as de facto farm managers (Leder, 2022). Near-balanced gender distribution in Maasin and Cabatuan reflects adaptive labor sharing, influenced by household composition and socio-cultural context (Arintyas, 2024; Rasheed et al., 2020). These dynamics highlight where productive and reproductive responsibilities meet in farming households. Married farmers also enable household-based production systems that are coordinated by each farm's family unit, leading to greater operational efficiency (Emran et al., 2021; Othman et al., 2020).

Farm families with single, widowed, or separated farmers experience even greater labor limitations, compelling them to discover flexible solutions to coordinate both reproduction and production (Borda et al., 2023; Njue and Odek, 2025). Religion, particularly Roman Catholicism, reinforces communal practices including planting rituals, harvest celebrations, and seed conservation, while minority faith groups have cultivated networks for the exchange of labor and collective decision-making (Tanko and Ismalia, 2021; Vasan and Yoganandan, 2024; Adefila et al., 2024).

Education levels are typically primary to secondary level. Farmers with less schooling depend on indigenous knowledge systems, but those with higher education work as intermediaries, combining indigenous knowledge with formal innovations in varietal conservation, climate adaptation, and productivity improvement (Rigg et al., 2020; DeLay et al., 2022; Prajapati et al., 2025).

Income levels suggest that a subsistence-centric system dominates and that the household is usually living below the poverty line (Gali et al., 2024). They limit investments in improved inputs and postharvest technologies, which decreases productivity (Abera and Assaye, 2021). Higher-income, diverse households tend to favor cooperative ventures and community-level activities. This is notable because the municipal disparities indicate that access to resources and institutional support is unequal, most of which is evident in Calinog and Lambunao (Couture et al., 2024; Bojnec and Knific, 2021). Hence, it is increasingly necessary to strengthen value chains, diversify agro-enterprises, and promote equitable access to resources to support productive tasks and the intergenerational continuity of traditional upland rice systems (Lagasca et al., 2024).

Municipality of Cabatuan

In Cabatuan, upland rice farming is a system with strong co-working family cooperation between men and women, including co-management of seed systems, sowing, weeding, harvesting, and postharvest operations; both men and women cooperate in the operation of the plants. This cooperative labor optimizes the productivity and food security in the subsistence economy (Carnegie et al., 2020). In many cases, the practical and health hazards of the work, including the physical work of land preparation, fertilizer application, and pest management, have been predominantly by men in the field considering the physical, technical and health problems resulting from machinery and chemical inputs (Rouf et al., 2025; Sabarmatee et al., 2025; Aung, 2023; Tham et al., 2023). Women's exclusive involvement in marketing, in particular in Barangay Talanghauan, emphasizes their importance in income management and socialized trade, and extends their productive function beyond field work (Zapico et al., 2023).

Municipality of Calinog

Seed management is largely joint across barangays, though female-exclusive management in Brgy. Aglonok. This observation highlights the central role of women in preserving, conserving indigenous varieties, and maintaining seed quality with high genetic purity, as mentioned by Njuki et al., (2023). Male dominance in labor-intensive activities persists, often reinforcing disparities in access to resources and training (Rietveld et al., 2023). Collaborative planting, weeding, harvesting, and post-harvest work reflect strong household interdependence during peak labor periods (Balogbog and Gomez, 2020; Osanya et al., 2020). Variations in fertilization and pest management indicate localized adaptation of fertilization capacity and technical expertise (et al., 2019, 2021). Limited marketing engagement reflects the subsistence and socio-cultural orientation of upland rice production, prioritizing household consumption and seed preservation (Glover and Stone, 2018; Zapico et al., 2020).

Municipality of Janiuay

Labor processes in Janiuay are mainly collaborative, with men and women co-managing seed systems and the important production stages that support varietal continuity and genetic diversity (Lopez et al., 2022). Males are still the dominant gender in land preparation owing to physical and technical work demands (Williams, 2023). Fertilization and pest management are determined by labor, economic capacity, and local norms (Gichungi et al., 2023). Joint participation refers to interdependence between households, and intermittent shared marketing indicates gradual shifts in gendered economic roles (Khanal et al., 2021). Traditional gender roles are still culturally anchored but are responsive to labor capacity and environmental conditions (Nagal, 2025).

Municipality of Lambunao

Female-led seed management in barangays illustrates women's position as guardians of indigenous rice varieties and intergenerational knowledge (Sood et al., 2015). Land preparation is still predominantly male-based because of deeply rooted cultural perceptions concerning the physically demanding labor (Elias et al., 2018), whereas planting, weeding, and harvesting are more collaborative and thus more resilient and labor productive (Van Eerdewijk and Danielsen, 2015; Jost et al., 2016). Fertilizer and pest management choice is influenced by economic factors and perceived productivity advantages (Kumar et al., 2021; Singh et al., 2017). The lack of marketing activities serves to highlight the subsistence nature of production that is oriented towards household consumption and cultural continuity (Manik et al., 2024; Britwum and Demont, 2022).

Municipality of Maasin

Joint male–female engagement and activities conducted in the seed system and key production activities represent a communal, family-based structure and enhance timeliness and productivity (Suess-Reyes and Fuetsch, 2016; Darnhofer et al., 2016). Men dominate land preparation, fertilization, and pest control due to physical demands and fertilization risks (Shisler, 2016; Raj et al., 2025). Pest management includes localized, low-input strategies such as manual removal and localizedl control, reflecting knowledge-driven subsistence practices (Bottrell and Schoenly, 2018; Daraban et al., 2023). Marketing is minimal, though occasional female participation emerges in shifts in economic engagement (Umanailo et al., 2018; Manik et al., 2024).

Comparative gender analysis across municipalities

TURVs farming in households based on household cooperation, subsistence orientation, and IKS across municipalities. Collaboration between male and female participants in planting, weeding, harvesting, and postharvest is uniform across sites, which indicates that productivity and food security rely on collaborative labour (Carnegie et al., 2020; Manalo IV et al., 2025). This is in line with relational/ resilience-based family farming systems in which complementary productive roles sustain livelihoods (Darnhofer et al., 2016; Ha et al., 2023), consistent with the Moser Gender Planning Framework and other evidence on women's adaptive labor contributions (Maynawang et al., 2021; Macusi et al., 2023).

Variation is most evident in seed system governance. For example, the shared management of seeds is the common practice in Cabatuan, Janiuay, and Maasin, and Lambunao has more independent women in seed selection and exchange, emphasizing women in saving the plant genetic resources and emphasizing indigenous knowledge (Sood et al., 2015; Acabado and Kuan, 2021; Makate, 2020). Calinog expresses a negotiated arrangement. The leadership of women in seed systems contributes to the improvement of agrobiodiversity conservation, food security, and adaptive capacity (Njuki et al., 2023; Ramirez-Santos et al., 2023; Gumban and Baladjay, 2025). Land preparation continues to be dominated by men who are culturally encouraged to associate strength and technical ability with men (Elias et al., 2018; Shisler, 2016; Khanal et al., 2021). Fertilizer and pest control follow similar trends, but the fertilizers emerge for resource accessibility and production mode. Lambunao, Janiuay, and Maasin focus on cost-effective and risk-reducing low-input strategies (Kumar et al., 2021), whereas Calinog and Cabatuan exhibit more male input-focused practices and adoption of technological changes (Rietveld et al., 2023; Huyer, 2016). Task-specializationon is also further influenced by education (Addai et al., 2021; Gebre et al., 2021; Maini et al., 2021).

Marketing is sparse, reinforcing subsistence priorities (Glover and Stone, 2018; Umanailo et al., 2018), although female-only or combined marketing in chosen villages represents slow change associated with migration and feminization of agriculture (Bacud et al., 2021; Leder, 202feminization., 2025). In general, a cooperative agrarian base coexists with context-specific gender negotiation that has real import on productivity, seed conservation, and resilience (Ali and Kamraju, 2023). Increasing women's representation in seed systems, promoting equality in extension provision, and promoting gender-aware climate-resilient approaches are crucial for the survival of indigenous upland rice systems (Huyer, 2021; Barooah et al., 2023; Nyasimi, 2021; Britwum and Demont, 2022).

CONCLUSIONS

It highlights the centrality of gender relationships in sustaining TURVs farming systems in the third District of Iloilo. In addition to task allocation, gendered labor arrangements serve as a socio-ecological mechanism that connects agricultural production, IKS, and household food security. By virtue of their complementary roles, these farming households meet labor constraints, environmental variability, and limited external input challenges and are resilient in their agricultural production, confirming the resilience of upland rice-based livelihoods. The results enhance our understanding that indigenous rice systems have been sustained not only by what is commonly referred to as agronomic, but also by socially embedded knowledge, decision-making and cultural processes. The participation of women in seed choosing and management reveals the importance, albeit largely devalued, of women's involvement in on-farm biodiversity preservation and male participation in physical labor and technical work in areas of field-level productivity. The interdependencies show that sustainability in old farming systems is realized by collaboration, not uniform labour participation. In developmental and policy terms, it shows that gender-neutral agriculture interventions risk undermining the very system they intend to improve. Farmers who do not consider differentiated roles, knowledge, and access to resources may inadvertently weaken conservation through seed-saving and food security at home. They can also prevent cultural continuity if they fail to understand the differentiation in role distribution, knowledge, and resource access. Strategies that are responsive to gender at its root can ensure interventions enhance rather than replace existing adaptive capacities.

In practicality, strengthening women's participation in decision-making, ensuring equitable access to extension services and training, supporting low-input, and culturally sensitive production systems can contribute to the long-term viability of traditional upland rice farming. Integrating gender considerations into local agricultural planning promotes equity, conservation, enhances household resilience, and sustains food systems imarginalizeded upland communities.

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DECLARATION

Informed consent statement

The study is conducted under rigorous ethical rules that involve human participants. Prior to data collection, appropriate clearance and permissions were granted by the relevant Local Government Units. All participants were notified to be fully informed about the nature of the study and underwent the process for obtaining prior informed consent (PIC) prior to participating in surveys and community-based consultations. Respondents' participation was completely voluntary, and they had the opportunity to refuse at any time without penalty. Confidentiality was rigorously maintained by not collecting any personally identifiable information, and data was provided only for research purposes. Cultural expectations, norms, and sensitivities were considered in the research process, and measures were taken to avoid any harm, whether physical or psychological.

Conflict of interest

The author declares that there is no conflict of interest between the tripartite parties (author, LGU, and farmer respondents) in regard to the publication of this paper.

AI Desclosure

The authors declare that no Artificial Intelligence (AI) or AI-assisted technologies were used in the preparatin of this manuscript.

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