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DIVERSIDADE E CONHECIMENTO TRADICIONAL SOBRE PLANTAS ALIMENTÍCIAS NÃO CONVENCIONAIS E SUBUTILIZADAS: PERCEPÇÃO, USOS E TRANSMISSÃO DE SABERES EM NAMPULA, NIASSA E ZAMBÉZIA, MOÇAMBIQUE

DIVERSITY AND TRADITIONAL KNOWLEDGE OF UNCONVENTIONAL AND UNDERUTILISED EDIBLE PLANTS: PERCEPTIONS, USES AND THE TRANSMISSION OF KNOWLEDGE IN NAMPULA, NIASSA AND ZAMBÉZIA, MOZAMBIQUE

DIVERSIDAD Y CONOCIMIENTO TRADICIONAL SOBRE PLANTAS ALIMENTICIAS NO CONVENCIONALES E INSUFICIENTEMENTE APROVECHADAS: PERCEPCIÓN, USOS Y TRANSMISIÓN DE CONOCIMIENTOS EN NAMPULA, NIASSA Y ZAMBÉZIA, MOZAMBIQUE

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Resumo

As Plantas Alimentícias Não Convencionais (PANCs) constituem um importante património biocultural, com elevado potencial para a diversificação alimentar, valorização da agrobiodiversidade e resiliência dos sistemas agroalimentares. Este estudo analisou o conhecimento tradicional, a percepção de ocorrência, os canais de transmissão de saberes e as barreiras socioculturais associadas às PANCs nas províncias de Nampula, Niassa e Zambézia, Moçambique. Adoptou-se uma abordagem de métodos mistos convergente, inquirindo 420 participantes via KoboCollect, complementada por 44 grupos focais e caminhadas etnobotânicas. A idade média dos inquiridos foi de 38,5 ± 13,05 anos (60,0% homens; 40,0% mulheres). Destacaram-se seis espécies de referência com elevada frequência de reconhecimento comunitário nas três Provincias: *Amaranthus spp.*, *Bidens pilosa* L., *Talinum sp.*, *Tamarindus indica* L., *Adansonia digitata* L. e *Annona senegalensis* Pers., reconhecidas por 94,8% da amostra (398/420). A transmissão do conhecimento ocorre predominantemente por via familiar (76,1%; 316/415). Contudo, observaram-se variações provinciais estatisticamente significativas (Monte Carlo RxC, $p < 0{,}001$): no Niassa (88,4%) e na Zambézia (92,6%) predominou a aprendizagem familiar, enquanto Nampula apresentou maior equilíbrio entre o núcleo familiar (53,8%) e as redes de vizinhança (41,3%). Não se observou diferença significativa na idade entre províncias (ANOVA, $F = 2{,}858$; $p = 0{,}058$). Análises qualitativas revelaram barreiras socioculturais persistentes, sobretudo entre os jovens, que associam o consumo de PANCs à pobreza e à "comida de fome". Conclui-se que as PANCs constituem recursos bioculturais estratégicos, cujo aproveitamento requer o fortalecimento da transmissão intergeracional, educação nutricional e desmistificação do estigma associado ao seu consumo. A integração destes conhecimentos nas políticas públicas e estratégias de conservação afigura-se fundamental para a sustentabilidade e soberania alimentar regional.

Palavras-chave: PANCs; plantas subutilizadas; conhecimento tradicional; transmissão de saberes.

Abstract

Non-conventional food plants (PANCs) constitute an important biocultural heritage, with high potential for dietary diversification, the enhancement of agrobiodiversity and the resilience of agri-food systems. This study analysed traditional knowledge, perceptions of occurrence, channels for knowledge transmission and the sociocultural barriers associated with PANCs in the provinces of Nampula, Niassa and Zambézia, Mozambique. A convergent mixed-methods approach was adopted, surveying 420 participants via KoboCollect, supplemented by 44 focus groups and ethnobotanical walks. The mean age of the respondents was 38.5 ± 13.05 years (60.0% men; 40.0% women). Six reference species stood out with a high frequency of community recognition across the three provinces:

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Amaranthus spp., Bidens pilosa L., Talinum sp., Tamarindus indica L., Adansonia digitata L. and Annona senegalensis Pers., recognised by 94.8% of the sample (398/420). Knowledge is transmitted predominantly through the family (76.1%; 316/415). However, statistically significant provincial variations were observed (Monte Carlo RxC, p<0.001): in Niassa (88.4%) and Zambezia (92.6%), learning within the family predominated, whilst Nampula showed a more balanced distribution between the family unit (53.8%) and neighbourhood networks (41.3%). No significant difference in age was observed between provinces (ANOVA, F=2.858; p=0.058). Qualitative analyses revealed persistent sociocultural barriers, particularly amongst young people, who associate the consumption of PANCs with poverty and 'food for the hungry'. It is concluded that PANCs constitute strategic biocultural resources, the utilisation of which requires strengthening intergenerational transmission, nutrition education and the demystification of the stigma associated with their consumption. The integration of this knowledge into public policies and conservation strategies appears to be fundamental for regional food sustainability and sovereignty.

Keywords: PANCs; underutilised plants; traditional knowledge; knowledge transmission.

Resumen

Las plantas alimenticias no convencionales (PANC) constituyen un importante patrimonio biocultural, con un elevado potencial para la diversificación alimentaria, la valorización de la agrobiodiversidad y la resiliencia de los sistemas agroalimentarios. Este estudio analizó los conocimientos tradicionales, la percepción de su presencia, los canales de transmisión de conocimientos y las barreras socioculturales asociadas a las PANC en las provincias de Nampula, Niassa y Zambézia, en Mozambique. Se adoptó un enfoque de métodos mixtos convergentes, encuestando a 420 participantes a través de KoboCollect, complementado con 44 grupos focales y paseos etnobotánicos. La edad media de los encuestados fue de 38,5 ± 13,05 años (60,0 % hombres; 40,0 % mujeres). Destacaron seis especies de referencia con una elevada frecuencia de reconocimiento por parte de la comunidad en las tres provincias: Amaranthus spp., Bidens pilosa L., Talinum sp., Tamarindus indica L., Adansonia digitata L. y Annona senegalensis Pers., reconocidas por el 94,8 % de la muestra (398/420). La transmisión de conocimientos se produce predominantemente a través de la familia (76,1 %; 316/415). Sin embargo, se observaron variaciones provinciales estadísticamente significativas (Monte Carlo RxC, p < 0,001): en Niassa (88,4 %) y en Zambézia (92,6 %) predominó el aprendizaje familiar, mientras que Nampula presentó un mayor equilibrio entre el núcleo familiar (53,8 %) y las redes de vecinos (41,3 %). No se observaron diferencias significativas en la edad entre las provincias (ANOVA, F = 2,858; p = 0,058). Los análisis cualitativos revelaron barreras socioculturales persistentes, sobre todo entre los jóvenes, que asocian el consumo de PANC a la pobreza y a la «comida de hambre». Se concluye que los PANC constituyen recursos bioculturales estratégicos, cuyo aprovechamiento requiere el fortalecimiento de la transmisión intergeneracional, la educación nutricional y la desmitificación del estigma asociado a su consumo. La integración de estos conocimientos en las políticas públicas y las estrategias de conservación resulta fundamental para la sostenibilidad y la soberanía alimentaria regional.

Palabras clave: PANC; plantas infrautilizadas; conocimiento tradicional; transmisión de conocimientos.

1. Introduction

Contemporary food and nutritional security faces the paradox of the increasing simplification of global food systems. Although the planet is home to thousands of edible plant species, human nutrition depends, to a large extent, on a few large-scale

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crops. This over-reliance on exogenous monocultures increases vulnerability to climatic and economic shocks a reality felt acutely in northern and central Mozambique, particularly in the provinces of Nampula, Niassa and Zambézia, where prolonged droughts in the interior and tropical cyclones along the coast repeatedly jeopardise essential crops such as maize and cassava (FAO, 2023; PADULOSI et al., 2013). As highlighted in a global assessment published in Nature Food (JONES et al., 2021), local agrobiodiversity remains underutilised in national food systems, undermining the resilience of rural communities.

Against this backdrop, the recovery and promotion of local food crops are directly aligned with the Sustainable Development Goals (SDGs), ranging from the eradication of hunger (SDG 2) and the promotion of good health (SDG 3), to sustainable production (SDG 12), climate action (SDG 13) and the protection of life on land (SDG 15). The theoretical basis for this approach rests on the convergence of two fundamental concepts: Non-Conventional Food Plants (PANCs) and Neglected and Underutilised Species (NUS).

The concept of NFP (KINUPP, 2007) carries a strong socio-cultural and geographical dimension, defining any edible species or part thereof whether native, exotic, wild or cultivated that is not part of the dominant commercial circuits or the prevailing daily diet of a region. This status also encompasses the non-conventional use of traditional crops, such as the use of cassava leaves (*Manihot esculenta Crantz*) to prepare matapa or pumpkin leaves (*Cucurbita moschata*). Furthermore, the concept of NUS (FAO, 2018; PADULOSI et al., 2013) has an agronomic and political basis, referring to species marginalised by scientific research and public investment, despite their nutritional richness and resilience to poor soils and water scarcity. In Mozambique, this intersection is evident in fruit and oil-bearing plants from the Miombo woodlands, such as the baobab (*Adansonia digitata* L.) and the canhoeira (*Sclerocarya birrea*), the exploitation of which remains predominantly extractive, with limited processing and little integration into formal markets (KINUPP & LORENZI, 2014).

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Beyond their agricultural value, these plants form the core of rural communities' biocultural heritage (TOLEDO & BARRERA-BASSOLS, 2008), representing a vast body of knowledge, local names and harvesting and preparation practices preserved over generations, in which women stand out as guardians of biodiversity. However, this heritage faces an imminent risk of biocultural erosion. The transmission of this traditional knowledge is not static: it is shaped by demographic dynamics, neighbourhood networks and sociocultural attitudes. The advance of urbanisation and the emergence of prejudices linking the consumption of these plants to poverty, desperation or 'starvation food'particularly amongst young people impose complex barriers to their perpetuation (NDLOVU et al., 2021).

Building on this premise, the overall aim of this study was to analyse the sociocultural dynamics and conservation potential of plant heritage in northern and central Mozambique, addressing three key objectives: to map the perceived presence and sociocultural diversity of PANCs and underutilised plants with the highest level of community recognition in the provinces of Nampula, Niassa and Zambézia; to understand the pathways of intergenerational transmission of traditional knowledge by assessing the mediating role of the family unit and neighbourhood networks in local learning; and to identify the sociocultural barriers, stigmas and gaps in valuation that constrain the acceptance of their consumption, thereby providing input for future public strategies on food security and biodiversity conservation.

2. Literature Review

2.1. Conceptual and Theoretical Framework: PANCs, NUS and Biocultural Memory

The approach to local food plants is based on the complementarity between two perspectives: the cultural perspective, defined by the concept of Non-Conventional Food Plants (PANCs) (KINUPP, 2007), referring to species or edible parts outside the dominant commercial circuits and the usual diet of a region; and the agronomic perspective, represented by Neglected and Underutilised Species (NUS) (FAO, 2018; PADULOSI et al., 2013), which encompasses hardy genetic resources with high

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nutritional value that have been marginalised by scientific research and agricultural extension. In sub-Saharan Africa and Mozambique, there is a direct overlap between these categories, where native and wild species such as *Amaranthus* spp. (Amarantus-Enhewe) and *Bidens pilosa* L. (Tuthuli) play a central role in community nutrition (NDLOVU et al., 2024; TADESSE et al., 2024).

The conservation of these species is underpinned by the theory of biocultural memory (TOLEDO & BARRERA-BASSOLS, 2008), which posits an inseparable link between biodiversity and human cultural heritage (beliefs, vernacular names and local knowledge). As emphasised by VIJAYAN et al. (2022) and KUHNLEIN & CHOTIBORIBOON (2022), the resilience of African ecosystems depends entirely on the continuity of these traditional knowledge systems, since the erosion of language and community-based management leads directly to the abandonment and disappearance of plant species in local habitats.

2.2. Food Security and Climate Resilience

The rural production system in Mozambique, particularly in the provinces of Nampula, Niassa and Zambézia, is characterised by a high dependence on a small number of subsistence and cash crops (such as maize and cassava), which are extremely vulnerable to extreme climate shocks (FAO, 2023). In the Miombo ecosystem, the recurrent occurrence of prolonged droughts in the interior and tropical cyclones along the coast severely compromises conventional agricultural production (CAMPBELL et al., 2007; SHACKLETON & GUMBO, 2010). In this unstable environment, wild agrobiodiversity and wild plants act as crucial ecological and social buffers, reducing the socio-economic vulnerability of rural households (JONES et al., 2021).

Native fruit and leafy plants serve as ‘nutritional bridges’ during the lean season preceding the main harvests (SHACKLETON & GUMBO, 2010). Studies show that hardy, wild leafy species such as *Amaranthus spp*. (Enhewe/Tseke), provide high levels of micronutrients (iron, calcium, provitamin A and vitamin C) that are vital for mitigating chronic child malnutrition and ensuring community food sovereignty (KINUPP & LORENZI, 2014; NDLOVU et al., 2024).

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Recent laboratory studies from northern Mozambique reinforce the need to distinguish perceived food value from measured composition. Cassava varieties cultivated in Nampula differed in carotenoid content and other physicochemical parameters (ROSA et al., 2026b), while dried cassava leaves from Anchilo contained nutritionally relevant minerals and low cyanide concentrations under the processing and analytical conditions tested (CHICOVELA et al., 2025). Carrots produced in different localities of Ribáuè likewise showed significant variation in β-carotene content (ROSA et al., 2026a). Although these crops are not among the six focal vernacular units, the findings demonstrate that nutritional value and safety are species-, variety-, locality-, and processing-specific and therefore require direct laboratory verification.

2.3. Social Dynamics and Knowledge Transmission

The retention of ethnobotanical knowledge in rural communities takes place through two key channels: vertical transmission (within the household, from parents to children) and horizontal transmission (through community and neighbourhood networks) (Reyes-García et al., 2013).

The ethnobotanical literature in Southern Africa emphasises the significant gender dimension in the selection, collection and management of native plant resources (HOWARD, 2003; Price, 2006). In Mozambique, rural women have established themselves as the primary custodians of agrobiodiversity and biocultural heritage, being responsible for the identification, harvesting, processing and culinary preparation of leafy plants and small wild fruit-bearing plants within the context of the domestic economy and food security (HOWARD, 2003;). In contrast, men's knowledge of the local flora focuses predominantly on large tree species used for construction, for clearing agricultural fields (machambas) and for the extraction of non-timber forest products of commercial value (PRICE, 2006; SHACKLETON & GUMBO, 2010).

3. Methodology

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3.1. Study Area and Geographic Mapping

Fieldwork covered nine selected districts in three provinces of central and northern Mozambique: Malema, Angoche, and Rapale in Nampula; Cuamba, Mecanhelas, and Mandimba in Niassa; and Alto Molócuè, Gilé, and Ile in Zambézia (Figure 1).

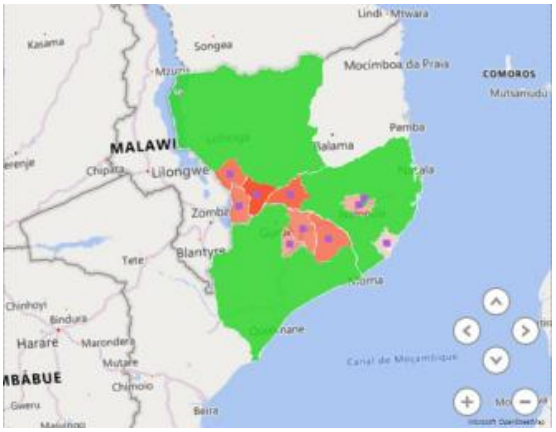


Figure 1. Geographic map of the study area covering the nine sampled districts in Nampula, Niassa, and Zambézia Provinces, Mozambique.

3.2. Procedures, Data Collection, and Analysis

A convergent cross-sectional study using mixed methods was conducted between September 2025 and April 2026. Quantitative and qualitative data were collected in parallel and integrated during the analysis and interpretation, by comparing patterns of recognition and sources of learning with the themes that emerged from the focus groups.

The target population consisted of residents aged between 16 and 76 from rural households, including farmers, community leaders and local experts on native plants. Nampula, Niassa and Zambézia, as well as the nine districts, were selected using non-probabilistic convenience sampling to cover the savannah agroecological zones, whilst also taking geographical accessibility into account. Communities were selected based on agroecological similarity and accessibility. Eligible participants had lived in the community for at least one year, were aged ≥16 years and participated voluntarily; temporary visitors and individuals unable to complete the questionnaire due to cognitive impairment were excluded. Recruitment combined convenience sampling and quotas at community level. The sample comprised 420 participants: 161 in

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Nampula, 148 in Niassa and 111 in Zambézia. The unequal sizes of the provincial samples reflected the relative population density of the selected rural areas, as well as the availability and accessibility of participants during fieldwork.

Trained interviewers, fluent in Portuguese and the local languages Emakhuwa, Elomwe and Cinyanja, administered the structured questionnaire digitally using KoboCollect. The questionnaire was developed in Portuguese and pre-tested with 20 participants in the district of Nampula to assess clarity, completion time and linguistic appropriateness; the pre-test data were excluded from the final analysis. During the interviews, the questions were translated orally into the participant's local language. Perceived recognition was assessed using a list of six vernacular names that stood out due to their high frequency of recognition and familiarity across the three provinces; in this study, these were considered the most common reference species in terms of community knowledge, such as: *Amaranthus spp.* (Enhewe), *Bidens pilosa* L. (Pega-pega/Thuthuli), *Talinum sp*. (Thethe), *Tamarindus indica* L. (Tamarinho/Wepa), *Adansonia digitata* L. (Imbondeiro/Malambi) and *Annona senegalensis Pers*. (wild Ata), accompanied by field photographs. Recognition was considered positive when a participant recognised the vernacular name and mentioned at least one traditional food use. The six priority plants were selected on the basis of their frequency of mention in the regional ethnobotanical literature.

3.3. Qualitative Component and Ethnobotanical Walks

Forty-four focus groups were conducted: 17 in Nampula-Malema (n = 6), Angoche (n = 6), and Rapale (n = 5); 15 in Niassa-Cuamba (n = 5), Mecanhelas (n = 5), and Mandimba (n = 5); and 12 in Zambézia-Alto Molócuè (n = 4), Gilé (n = 4), and Ile (n = 4). Each group included six to eight participants, for approximately 300 qualitative participants aged 16-76 years, including young people, women, community leaders, elders, and farmers. Sessions lasted 45-60 minutes and were held in schools, village administrative centres, or outdoor community spaces. The principal investigator moderated the sessions with an observer responsible for field notes. With authorization, audio recordings and analytical notes were produced; the material was transcribed, translated into Portuguese, and anonymized. Hybrid

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content analysis combined deductive and inductive categories with support from NVivo 12 Plus. Thematic sufficiency was reached when additional groups no longer generated new categories. Ethnobotanical walks were conducted in the selected communities with local experts to record vernacular names, occurrence environments, photographs, and plant parts reported as edible.

3.4. Botanical Identification

Vernacular units in Emakhuwa and Ciyao were provisionally linked to taxonomic identifications by cross-referencing local names with Mozambican ethnobotanical literature and examining field photographs. Because no voucher specimens were formally deposited, voucher codes were not assigned. Future collection of botanical material is recommended for expert confirmation and herbarium deposition. Vernacular names and botanical species were therefore not treated as automatically equivalent.

3.5. Quantitative Analysis

Data were analyzed using IBM SPSS Statistics, version 26.0. Frequencies, means, standard deviations (SD), standard errors (SE), and 95% confidence intervals (95% CIs) were calculated. For sample planning, Cochran's formula for an unknown population, $n = Z^2p(1-p)/e^2$, was applied with $Z = 1.96$, $p = 0.50$, and $e = 0.05$, yielding $n = 384.16$, rounded up to 385 participants; the target was increased to 420 to allow for possible data loss (Cochran). Because recruitment was non-probabilistic, the confidence and error parameters guided planning but do not ensure statistical representativeness. For the sparse table of the main learning source by province, an exact test for an R × C table was performed using Monte Carlo simulation with fixed margins, 200,000 replicates, and seed 20260812; Cramér's V was also calculated.

4. Results and Discussion

4.1. Participant Profile and Territorial Distribution

Table 1. Descriptive analysis of participant age by province.

Province	N	Mean (years)	Standard deviation (SD)	Standard error	Minimum	Maximum	95% CI (lower–upper)
Nampula	161	39.57	11.027	0.869	17	75	37.86–41.29

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Niassa	148	36.45	14.832	1.219	16	72	34.04–38.86
Zambézia	111	39.68	13.004	1.234	17	76	37.24–42.13
Overall	420	38.50	13.050	0.637	16	76	37.25–39.75

The sample included 420 participants, with an overall mean age of 38.50 years (SD = 13.05) and a range of 16-76 years (Table 1). Mean ages were similar in Nampula (39.57 years), Niassa (36.45 years), and Zambézia (39.68 years), with greater age variability in Niassa (SD = 14.83). This age range strengthens the study by incorporating the perspectives of younger, middle-aged, and older participants on underutilized food plants. Similar provincial means suggest that observed contrasts are unlikely to be attributable exclusively to age, although they do not demonstrate equivalence among samples or intergenerational transmission.

Table 2. One-way ANOVA of participant age across provinces.

Source of variation	Sum of squares	Degrees of freedom (df)	Mean square	F statistic	p value
Between groups	965.040	2	482.520	2.858	0.058
Within groups	70391.960	417	168.806	—	—
Total	71357.000	419	—	—	—

The one-way ANOVA did not detect a statistically significant difference in mean age across the three provinces ($F(2, 417) = 2.858$, $p = 0.058$, $\eta^2 = 0.014$; Table 2). The small effect size indicates that province accounted for a limited proportion of age variation. This finding supports descriptive comparison but does not demonstrate sample equivalence.

Table 3. Sample distribution by sex, province, and district.

Province / district	Women (n)	Women (%)	Men (n)	Men (%)	Total (N)
Nampula	75	46.6%	86	53.4%	161
Angoche	43	44.8%	53	55.2%	96
Malema	10	30.3%	23	69.7%	33
Rapale	22	68.8%	10	31.2%	32
Niassa	49	33.1%	99	66.9%	148
Cuamba	17	30.4%	39	69.6%	56
Mandimba	10	21.3%	37	78.7%	47
Mecanhelas	22	48.9%	23	51.1%	45
Zambézia	44	39.6%	67	60.4%	111

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Alto Molócuè	19	41.3%	27	58.7%	46
Gilé	16	40.0%	24	60.0%	40
Ile	9	36.0%	16	64.0%	25
Overall	168	40.0%	252	60.0%	420

The sample included 252 men (60.0%) and 168 women (40.0%), with male predominance in Niassa (66.9%) and Zambézia (60.4%). Nampula showed a more balanced distribution, although Rapale had a higher proportion of women (68.8%). Including both sexes broadens the range of documented experiences; however, compositional differences among districts, particularly the high proportion of men in Mandimba (78.7%), should be considered when interpreting provincial contrasts (Table 3).

4.2. Knowledge and Perceived Occurrence

Among participants, 398/420 (94.8%) reported recognizing the local occurrence of at least one plant included in the study. Table 4 summarizes six vernacular units that were frequently cited or observed. A recent systematic review documented high richness of wild edible plants in Ethiopia, but its diversity assessment relied on taxonomic inventories and verification against botanical databases, illustrating why perceived recognition should not be equated with botanical diversity (TADESSE et al., 2024).

Table 4. Highlighted vernacular units and provisional taxonomic identifications.

Local name and family	Provisional taxonomic identification	Reported/observed occurrence environment	Reported edible part
Amaranthus–Enhewe (Amaranthaceae)	*Amaranthus spp. (A. viridis L. / A. spinosus L.)*	Ruderal/spontaneous herb in fallow land and cultivated fields	Leaves and tender shoots
Pega-pega–Tuthuli (Asteraceae)	*Bidens pilosa L.*	Spontaneous/weedy herb in cultivated agricultural soils	Leaves and young shoots
Thethe (Talinaceae)	*Talinum sp.*	Spontaneous/subsucculent herb in sandy soils and fallow land	Leaves and fleshy shoots
Tamarind–Wepa (Fabaceae)	*Tamarindus indica L.*	Underutilized perennial tree in savannas and woodland edges	Fruit pulp and young leaves

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Baobab–Mulapa (Malvaceae)	*Adansonia digitata L.*	Large underutilized tree in dry forests	Fruit, young leaves, and bark
Mayepe–Wild custard apple (Annonaceae)	*Annona senegalensis Pers.*	Native underutilized shrub or small tree in savannas	Ripe fruit pulp

4.3. Learning Sources for Traditional Knowledge

Table 5. Main reported learning source by province (n = 415).

Province	Family (n; %)	Neighbours (n; %)	Observation (n; %)	Own experience (n; %)	Other (n; %)	Total
Nampula	86 (53.8%)	66 (41.3%)	0 (0.0%)	4 (2.5%)	4 (2.5%)	160 (100%)
Niassa	130 (88.4%)	14 (9.5%)	0 (0.0%)	2 (1.4%)	1 (0.7%)	147 (100%)
Zambézia	100 (92.6%)	4 (3.7%)	2 (1.9%)	0 (0.0%)	2 (1.9%)	108 (100%)
Overall	316 (76.1%)	84 (20.2%)	2 (0.5%)	6 (1.4%)	7 (1.7%)	415 (100%)

Among 415 valid responses, family was the main reported learning source (316/415; 76.1%), followed by neighbours (84/415; 20.2%); five participants did not respond. This pattern describes social learning pathways associated with knowledge transmission. However, the 'family' category does not identify the generation or kinship relationship of the person who taught the participant and therefore does not, by itself, demonstrate intergenerational transmission. The distribution of the main learning source differed across provinces in the exact R × C test with Monte Carlo simulation ($p < 0.001$; 200,000 replicates); Cramér's V was 0.320.

The findings indicate broad perceived occurrence of the studied plants and strong family involvement in knowledge transmission, particularly in Niassa and Zambézia (Table 5). In Nampula, the greater proportional contribution of neighbours suggests more community-based circulation of knowledge. This contrast is descriptive rather than causal and may reflect recruitment, sex and age composition, district, community, or local social networks. Recent literature shows that agrobiodiversity remains underused in food systems and that neglected species face stigma, fragmented research, and limited policy support (JONES et al.; NDLOVU et

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al.). Valorization should therefore combine participatory documentation, botanical identification, food-safety assessment, and conservation, avoiding the interpretation of perceived recognition as evidence of nutritional composition or dietary impact.

Complementary evidence from Mozambique also illustrates the importance of analytical validation. Honey samples from Nampula, Sofala, Manica, and Zambézia differed in their phenolic and flavonoid profiles and antioxidant activity (TANLEQUE-ALBERTO et al., 2020), while ethanolic extracts of *Lippia alba* collected in Nampula and Murrupula displayed phytochemical constituents and in vitro antifungal activity (ROSA et al., 2025). These products and biological outcomes fall outside the scope of the present survey and cannot be extrapolated to the six focal plants; rather, they show why community-reported value should guide, but not replace, species-specific nutritional, toxicological, and bioactivity assays.

5. Conclusion

Among participants in the selected communities, perceived recognition of food plants was widespread, and family was the main reported learning source. Nampula showed a proportionally greater contribution of neighbours, suggesting different social pathways of knowledge transmission without permitting causal attribution or demonstrating intergenerational transmission.

Six vernacular units were highlighted in the survey and assigned provisional taxonomic identifications. These records document culturally relevant knowledge but do not constitute a botanical inventory or permit estimates of frequency, richness, or diversity.

Qualitative accounts suggest the coexistence of perceived value and symbolic associations with poverty or scarcity. Recommendations for extension, school feeding, or public policy should be conditional on botanical confirmation, safety and nutritional-composition assessments, sustainable availability, and community participation.

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