

Determinants of Household Perceptions and Acceptance of Sago as a Local Staple Substitute

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ABSTRACT

Research on local food systems has often overlooked the comprehensive dynamics of household perceptions, particularly in archipelagic regions characterised by high levels of food vulnerability. This study aimed to examine the determinants of household perceptions and acceptance of sago (*Metroxylon sago*) as a local staple food substitute in Tidore, Indonesia. A quantitative approach was employed through a survey of 88 households selected using proportional random sampling from a population of 728 households. Data were collected using a structured Likert-scale questionnaire and analysed using descriptive statistics, perception index analysis, and multiple linear regression. The findings revealed that household perceptions of sago were generally high, as reflected by the accessibility and availability index (76.74), nutrition and health awareness index (87.84), social acceptance index (88.18), and economic value and food security index (85.97). Multiple regression analysis indicated that age ($B = 2.31$, $p = 0.021$), education ($B = 3.59$, $p < 0.001$), and household size ($B = 5.19$, $p < 0.001$) had positive and statistically significant effects on household perceptions of sago. In contrast, household income showed no significant effect ($B = -1.97$, $p = 0.11$), while the model explained 54.7% of the variance in household perceptions ($R^2 = 0.547$). These findings provide empirical evidence that sago represents a strategic local food resource for strengthening food security in archipelagic regions. The study highlights the need for local governments to formulate integrated food diversification policies and promote value-added processing of sago-based products to reduce dependence on imported staple foods.

Keywords: household perception; local food; sago; food security; island region.

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INTRODUCTION

This research is based on the concept of food security through the development of local sago (*Metroxylon sago*) as an alternative strategy in island regions. Globally, dependence on major food commodities such as rice, wheat, and corn dominates up to 80% of global food consumption, which can lead to the vulnerability of food systems to climate change and production disruptions (Cheng et al., 2017; Hossain, 2014; Kasanaboina et al., 2025; Yudha et al., 2023). This global food security challenge threatens the ability to provide sufficient, nutritious, and affordable food for the ever-growing human population, which is estimated to increase from 7 billion in 2011 to 9 billion in 2050 (Hussain et al., 2025; Lal, 2013). Additionally, climate change severely disrupts planting seasons and crop yields, further intensifying pressure on regional food availability (Wahlqvist, 2025; Wamwea & Culas, 2024).

The global phenomenon shows a stark paradox between the abundant potential and the actual utilisation of local food, particularly sago. According to (Rahayu et al., 2023), Indonesia possesses abundant sago resources and high productivity, yet domestic sago consumption continues to decline due to the systemic dominance of rice and shifting modern consumption patterns among the population. A clear empirical reflection of this trend is observed in North Maluku. As an archipelagic region with naturally abundant sago availability and massive potential as a primary source of sustainable food, its position has been increasingly shifted by modern and rice-based food supplies (BPS Maluku Utara, 2026).

To understand why local food substitution faces challenges, a robust theoretical framework explaining how household food choices are constructed is essential. Conceptually, household perception is not formed in a vacuum; rather, it is driven by complex socio-psychological mechanisms. Drawing upon the Food Choice Process Model (Furst et al., 1996) and the Theory of Planned Behaviour (TPB) (Ajzen, 1991) Individual perceptions and subsequent acceptance toward alternative foods are shaped by three interconnected pillars: behavioural beliefs (perceived nutritional and health benefits), normative beliefs (social acceptance and cultural familiarity), and control beliefs (perceived accessibility, availability, and economic affordability).

In archipelagic contexts, these cognitive factors are heavily constrained by geographic isolation, which directly affects household evaluations of food availability and economic value. Therefore, exploring food substitution requires an integrated lens that connects these behavioural theories with localised socio-economic variables. While the urgency of food diversification is widely recognised, existing literature on local food perceptions remains heavily fragmented and partial. Previous studies frequently isolate consumer perceptions into singular dimensions, focusing strictly on technical processing, nutritional attributes, or macro-level supply chains, without integrating established behavioural frameworks to map household decision-making.

Furthermore, empirical focus has been heavily biased toward major landmasses, leaving a significant analytical gap regarding archipelagic dynamics. Island regions, such as the Tidore Islands, present unique structural vulnerabilities such as high dependency on marine logistics and extreme susceptibility to rice supply shocks paired with distinct socio-cultural ties to sago as a traditional backup staple. To address this gap, the present study provides a comprehensive analysis of household perceptions and acceptance of sago as a local staple food substitute, particularly in archipelagic regions. The novelty of this study lies in its empirical integration of key behavioural dimensions, including accessibility, health awareness, social acceptance, and economic security, to evaluate household readiness for food system transition in food-vulnerable island communities. By doing so, this study fills an important knowledge gap and proposes a replicable analytical framework to support the development of food security policies tailored to archipelagic regions.

LITERATURE REVIEW

Sago (*Metroxylon sagu*) has increasingly been recognised as a strategic indigenous crop for promoting sustainable food systems, particularly in tropical archipelagic regions where dependence on imported staple foods remains high. As a traditional carbohydrate source, sago contributes not only to food security by serving as a viable substitute for rice but also to dietary diversification through the production of various nutritious local food products with significant cultural value (Agesti et al., 2023; Fitriyah et al., 2025; Kadir et al., 2024; Sumardiono et al., 2022).

Beyond its nutritional contribution, sago cultivation offers considerable environmental advantages because it requires relatively low water and chemical inputs, adapts well to marginal ecosystems, and supports wetland conservation, making it compatible with climate-resilient agriculture and sustainable land management (Hidayat et al., 2018; Noer et al., 2022). Nevertheless, despite these ecological and socio-economic advantages, the utilisation of sago continues to decline due to limited processing technology, inadequate market infrastructure, weak value chains, and persistent social perceptions that position local food as less prestigious than rice, thereby constraining its contribution to sustainable food systems (Dina et al., 2025; Katsuya & Kadir, 2018).

These challenges become even more pronounced in archipelagic regions, where geographic fragmentation, transportation constraints, and dependence on external food supply chains create a paradox in which abundant local food resources coexist with increasing dependence on imported rice (FAO, 2025). Such conditions suggest that strengthening local food systems requires more than technological innovation or production enhancement; it also requires understanding the social and psychological processes that shape household food choices (Ajzen, 1991; Furst et al., 1996). In particular, household perceptions influence whether local food resources such as sago are accepted, rejected, or substituted by commercially available staples despite their ecological and nutritional advantages (Bir et al., 2019; Sidiq et al., 2022). Consequently, examining household perceptions provides an important behavioural perspective for explaining the persistence of rice dependency in island food systems.

Household perception toward local food is widely recognised as a multidimensional construct shaped by geographical, economic, social, cultural, and psychological factors (Bir et al., 2025; Jensen et al., 2019). This perspective is consistent with the Food Choice Process Model developed by (Furst et al., 1996), which explains that food choices emerge through interactions among life experiences, personal values, available resources, and social contexts, and the Theory of Planned Behaviour proposed by (Ajzen, 1991), which argues that food-related behaviours are determined by attitudes, subjective norms, and perceived behavioural control.

Together, these theories provide a robust conceptual foundation for explaining why households may or may not adopt local staple foods, even when such foods are nutritionally beneficial and physically available. Therefore, household perception represents an essential intermediary between the availability of local food resources and actual consumption behaviour. Building upon these theoretical perspectives, this study

conceptualises household perception toward sago-based local food through four complementary dimensions adapted from validated local food perception studies (Bir et al., 2025; Frash et al., 2015; Jensen et al., 2019). The first dimension, Accessibility and Availability, reflects household perceptions regarding the physical ease of obtaining sago under the logistical constraints characteristic of island regions and is adapted from (Brown et al., 2019).

The second dimension, Nutrition and Health Awareness, captures household beliefs concerning the nutritional quality, freshness, and health benefits of consuming sago (Bir et al., 2025). The third dimension, Social and Cultural Acceptance, evaluates the influence of subjective norms, cultural identity, and perceived social prestige associated with consuming sago rather than rice (Frash et al., 2015). Finally, the fourth dimension, Economic Value and Food Security, reflects household perceptions regarding the affordability of sago, its economic benefits, and its role as a food security buffer during supply disruptions (Webber & Dollahite, 2008). Collectively, these four dimensions provide a comprehensive framework for understanding household acceptance of local staple foods within island food systems.

Although previous studies have demonstrated that local food is generally perceived as healthier, fresher, environmentally friendly, and beneficial for local economies, important research gaps remain. First, existing studies predominantly examine local food systems from production, marketing, governance, or policy perspectives, while relatively limited attention has been devoted to household perception as a multidimensional determinant of food choice behaviour (Kang et al., 2022; Munialo et al., 2023).

Second, empirical evidence investigating household perceptions within small-island food systems remains scarce despite their unique geographical and socio-economic characteristics. Third, few studies have simultaneously examined how socio-demographic characteristics, including age, education, household size, and income, influence multiple dimensions of household perception toward indigenous staple foods. Addressing these gaps is essential for generating evidence that supports policies aimed at strengthening local food systems and reducing dependence on imported staple foods in Indonesia's archipelagic regions. Based on the Food Choice Process Model, the Theory of Planned Behaviour, and previous empirical findings, this study proposes that household socio-demographic characteristics significantly influence perceptions toward local sago-based food. Older household members are expected to possess stronger cultural attachment and familiarity with sago, leading to more favourable perceptions.

Higher educational attainment is expected to enhance awareness of nutritional benefits and environmental sustainability associated with sago consumption. Larger households are hypothesised to perceive sago more positively because of its affordability and role in improving household food security. Meanwhile, household income is expected to influence perceptions by shaping purchasing power and preferences between traditional local staples and commercially available rice. Accordingly, the following hypotheses are proposed:

H1: Age has a significant positive effect on household perceptions toward sago.

H2: Education has a significant positive effect on household perceptions toward sago.

H3: Family size has a significant positive effect on household perceptions toward sago.

H4: Income has a significant effect on household perceptions toward sago.

METHOD

Study Area

The research was conducted in three villages, namely Akedotilou Village, Aketobololo Village, and Sigela Yef Village, Tidore, Indonesia. The selected research area is an island region characterised by dispersed settlements and inter-regional accessibility that relies heavily on high-cost sea and land transportation. The selection of research locations in the three villages was done deliberately with the consideration that the community still consumes and utilises sago as part of the local food system. In addition, the community is relatively homogeneous in terms of socio-economic structure, with most of its households relying on small-scale agriculture and fisheries. These characteristics allow for perception studies at the community level without making broad generalisations.

Sampling procedure and sample size

The population in this study consists of 728 households spread across three villages. The sample was determined using the Slovin formula (Tejada et al., 2012) as follows:

$$n = \frac{N}{1 + Ne^2}$$

Explanation: n = Sample Size, N = Population, e = error rate (10%). With a 10% error rate, a sample of 88 households was obtained as respondents, where the sampling technique was conducted using proportional random sampling. While a 5% margin of error is standard in broader socio-economic research, a 10% error rate was intentionally selected due to the specific conditions of the archipelagic research setting. The target population exhibits a high degree of socio-economic homogeneity, 93% are small-scale farmers and share a highly uniform cultural background regarding sago consumption. Statistically, high population homogeneity reduces variance, allowing a smaller sample size to remain representative. Furthermore, this approach balances statistical practicalities with severe logistical, financial, and geographical constraints inherent to fragmented island transport networks in the Tidore Islands. In local-scale research, a precision level of 10% is still acceptable under certain conditions and statistically significant, especially when the research still provides insights to obtain contextual understanding rather than broad generalisation (Ozili, 2023).

Data collection sources

Primary data were obtained through a survey using a structured questionnaire that included the socio-economic characteristics of households, such as age, education, income, and the number of household members. Then there is a section of the questionnaire about sago consumption patterns and perceptions of sago as a local food.

Next, perception was measured using a Likert scale (Likert, 1932): 1 = strongly disagree, 2 = disagree, 3 = neutral, 4 = agree, 5 = strongly agree.

The perception indicators in this study include: awareness of nutritional value, cultural attachment, accessibility and availability, economic value, and willingness to substitute for staple foods. The research instrument was then tested using validity and reliability tests with Cronbach's Alpha (Hair et al., 2019).

Analytical Techniques

The data analysis approach in this study uses descriptive and inferential approaches. Descriptive analysis is used to describe the characteristics of respondents and the distribution of perception answers through the calculation of frequency, percentage, and average value. Next, the perception index calculation is performed using the formula:

$$Index = \frac{Actual\ Score}{Maximum\ Score} \times 100$$

Perception categories are determined as follows: 0-40 = low, 41-70 = medium, 71-100 = high. This index approach is used to interpret aggregate Likert scale data, which is commonly used in social research (Field, 2018). For inferential analysis used to identify factors influencing household perception of sago, multiple linear regression analysis (Mohr et al., 2022) is employed with the following model:

$$Perception_i = \beta_0 + \beta_1 Age_i + \beta_2 Education_i + \beta_3 Income_i + \beta_4 Family\ Size_i + \varepsilon_i$$

Regression analysis is used to test the influence of socio-economic characteristics on the level of perception. The reason for using linear regression on social data with a limited sample size can still be conducted as long as the basic statistical assumptions can be met (Field, 2018). The characteristics of household respondents in this study are viewed from age, gender, family size, education level, income, and occupation. More specifically, the household characteristics of the respondents can be seen in the following table.

RESULTS AND DISCUSSION

The characteristics of household respondents in this study are viewed from age, gender, family size, education level, income, and occupation. The detailed profile of the household respondents is presented in Table 1.

Table 1. Characteristics of respondent households

Respondent Characteristics	Description	Number of Respondents	Percentage (%)
Age	Young Adults (20–30 years)	6	6.8
	Middle-aged (31–50 years)	66	75.0
	Older Adults (51–57 years)	16	18.2
Gender	Female	6	6.8
	Male	82	93.0
Household Size	< 4 persons (Small household)	72	81.8

Respondent Characteristics	Description	Number of Respondents	Percentage (%)
Education Level	5–6 persons (Medium household)	16	18.2
	No formal education	27	30.7
	Primary school	36	40.9
	Junior high school	7	8.0
	Senior high school	18	20.5
Income	Low income (< IDR 1,500,000)	72	81.8
	Low income (IDR 1,500,000–2,500,000)	16	18.2
Occupation	Farmer	82	93.2
	Private sector	6	6.8

Source: Primary Data, 2025

Table 1 presents the sociodemographic characteristics of the respondents, the majority of whom are aged 31–50 years with a proportion of 75.0%, followed by the age group of 51–57 years at 18.2% and the age group of 20–30 years at 6.8%. This composition indicates that most respondents are in their productive years and belong to the age group that economically plays the role of decision-makers in the household. From the gender perspective, the respondents were predominantly male at 93%, while females accounted for only 6.8%. This data indicates that male dominance occurs in household decision-making regarding economic and production matters. Next, the size of the respondents' families mostly falls into the category of small households, with less than four people, at 81.8%, while households with 5-6 family members account for 18.2%. With the dominance of relatively smaller household structures, consumption is relatively more controlled compared to larger household structures.

The education level of the respondents indicates that the majority have low levels of education. As many as 30.7% of households have never attended school, and 40.9% have only completed elementary school education. Furthermore, only 8% of respondent households have completed junior high school education, and 20.5% have reached senior high school level. The low level of education indicates that households have limitations in accessing information, including information related to food diversification, nutritional value, and food processing innovations. From an economic aspect, 81.8% of the respondent households fall into the low-income category, earning less than Rp1,500,000 per month, while 18.2% fall within the range of Rp1,500,000 to Rp2,500,000. Thus, it can be concluded that the respondent households belong to the low-income group, with a likelihood of having limited purchasing power that may affect their preference for local food.

From the type of occupation, the majority of the respondents' households are farmers, accounting for 93.2%, and 6.6% work in the private sector. This condition indicates that the respondents' livelihoods tend to be homogeneous and dependent on the agricultural sector. Table 1 reveals a significant concentration in gender and occupational distribution, where 93% of the respondents are male, and 93% are registered as farmers. This demographic composition reflects the actual socio-economic structure of

the study area in Tidore, where the position of the head of the household is culturally dominated by men, who concurrently act as the primary decision-makers regarding family food consumption and allocation. Furthermore, the high percentage of farmers aligns with the agrarian characteristics of the archipelagic region, which heavily relies on local agricultural management, including sago cultivation as the primary source of livelihood. Despite this structural dominance, variations in household perception are objectively captured through the diverse distribution of age, formal education, and income levels among the respondents. Overall, it can be concluded that the characteristics of the respondents depict the characteristics of an agrarian island society with a relatively homogeneous socio-economic structure, dominated by male heads of households of productive age, but with low education and low income. Therefore, this condition becomes an important context in understanding how household perceptions of sago are formed within the island community.

Validity and Reliability Test

Before assessing household perceptions, the research instrument, consisting of 17 items, was subjected to validity and reliability testing. Based on the evaluation criteria, where an item is considered valid if the Pearson correlation coefficient (r) > 0.30 and the significance level (p) < 0.05 , the empirical results demonstrate that 11 items are declared valid. Conversely, 6 items were declared invalid as they failed to meet the statistical thresholds. The detailed distribution of the validity and reliability test for each measurement item is structured in Table 2:

Table 2. Validity and reliability test of the research instrument

No	Item	r (Pearson)	p-value	Criteria	Decision
1	A1	0.777	0.000	$r > 0.30$	Valid
2	A2	0.489	0.000		Valid
3	A3	0.397	0.000		Valid
4	A4	0.134	0.481		Not Valid
5	B1	0.740	0.000		Valid
6	B2	0.295	0.114		Not Valid
7	B3	0.120	0.526		Not Valid
8	B4	-0.061	0.751		Not Valid
9	B5	0.711	0.000		Valid
10	C1	0.889	0.000		Valid
11	C2	-0.144	0.448		Not Valid
12	C3	0.144	0.448		Not Valid
13	C4	0.907	0.000		Valid
14	D1	0.466	0.000		Valid
15	D2	0.528	0.000		Valid
16	D3	0.409	0.000		Valid
17	D4	0.553	0.000		Valid

Note: Items are considered valid when $r > 0.30$ and $p < 0.05$

The results from Table 2 indicate that the research instrument possesses sufficient internal consistency and validity for the remaining variables after excluding the invalid indicators. This step ensures that the subsequent regression model is built upon highly rigorous and stable empirical measures. The results of the validity test show that out of 17 instrument items, 11 items are declared valid because they have a correlation coefficient (r) > 0.30 and significance < 0.05 . Meanwhile, the other 6 items are declared invalid because they do not meet these criteria. Thus, the research instrument is sufficiently valid, but it requires refinement on several items to improve the quality of measurement.

The validity testing of the instrument was conducted using Pearson correlation between item scores and total construct scores (corrected item-total correlation). An item is considered valid if the correlation coefficient (r) is greater than 0.30 and the significance value $p < 0.05$ with a 95% confidence level. These criteria are widely used in social science research to determine whether an indicator can represent the measured construct (Field, 2018; Hair et al., 2019). Next, the reliability test of the instrument was conducted using the Cronbach's Alpha coefficient (Cronbach, 1951) to measure the internal consistency between items within a construct. The analysis results show that 11 constructs have a Cronbach's Alpha value of 0.70, indicating a good level of reliability.

Descriptive statistics

Table 3. Descriptive statistics of respondents

Variable	Mean	Std. Deviation	Minimum	Maximum
Access and Availability	3.84	0.89	2.00	5.00
Nutritional and Health Awareness	4.39	0.69	2.00	5.00
Social Acceptance	4.41	0.49	4.00	5.00
Economic Value and Food Security	4.30	0.60	2.00	5.00

Source: Primary Data, 2025

The results of the descriptive statistical analysis provide an overview of the respondents' perceptions regarding variables related to food security, namely access and availability, nutritional and health awareness, social acceptance, as well as economic value and food security. The access and availability variable has an average value of 3.84 with a standard deviation of 0.89. This average value indicates that respondents perceive the condition of food access and availability to be in the high category. However, the relatively larger standard deviation compared to other variables indicates a variation in respondents' perceptions of food access indicators. This suggests that not all respondents have the same level of food access, which may be influenced by socioeconomic factors, food distribution, or geographical conditions of the area. Food access is one of the main dimensions of food security that relates to the ability of individuals or households to obtain sufficient food both physically and economically (Compton, 2014; de Pee, 2012; Martínez et al., 2014; Mbene et al., 2023; Pérez-Escamilla, 2024).

The variable of nutrition and health awareness shows an average value of 4.39 with a standard deviation of 0.69. The high average value indicates that respondents have a very good level of awareness regarding the importance of nutrition and health aspects

in meeting food needs. Nutrition awareness is an important factor in food utilisation because the consumption of nutritious and balanced food greatly determines the quality of public health. According to (FAO, 2008; Karamravan et al., 2014; Yolcuoğlu & Kızıltan, 2022) Optimal food utilisation is greatly influenced by the knowledge and awareness of the community regarding nutritional and health aspects. The social acceptance variable has an average value of 4.41 with a standard deviation of 0.49, indicating that respondents have a very high level of social acceptance towards the aspects being studied. The minimum value of 4.00 also indicates that all respondents provided relatively high ratings for the social acceptance indicators. This shows that cultural and social factors play an important role in supporting community acceptance of certain food consumption patterns. In the context of food security, social and cultural aspects often influence food preferences and consumption patterns in society (Cannuscio et al., 2014; Owens et al., 2022; Tembo et al., 2025; Turner et al., 2021).

Meanwhile, the variable of economic value and food security has an average value of 4.30 with a standard deviation of 0.60. The high average value indicates that respondents view the economic aspect as having a significant role in supporting food security. The economic factor is related to the household's ability to obtain food through income, food prices, and economic stability. According to (Ardakani et al., 2017; de Pee, 2012; Eka Suranny et al., 2022; Freddy, 2013; Keller et al., 2018), Economic access to food is one of the main factors that is very important and determines the success of a food security system. Overall, the results of the descriptive statistical analysis show that all research variables have average values that fall within the high to very high category. This indicates that respondents have a positive perception of the factors influencing food security, particularly in terms of nutritional awareness, social acceptance, and the economic value of food. These findings suggest that social, economic, and nutritional knowledge factors play an important role in supporting the community's food security system. The household perception towards sago as a sustainable local staple substitute was measured across four distinct dimensions. The empirical index scores are detailed in Table 4.

Table 4. Distribution of household perceptions of local sago food in Tidore

Item	SD (%)	D (%)	N (%)	A (%)	SA (%)
A1	0%	48%	0%	48%	5%
A2	0%	1%	0%	77%	22%
A3	0%	0%	0%	77%	23%
B1	0%	2%	0%	43%	55%
B5	0%	6%	0%	55%	40%
C1	0%	0%	0%	70%	30%
C4	0%	0%	0%	48%	52%
D1	0%	0%	0%	53%	47%
D2	0%	10%	0%	84%	6%
D3	0%	0%	0%	45%	55%
D4	0%	0%	0%	67%	33%

Note: STS=strongly disagree, TS=disagree, N=neutral, S=agree, SS=strongly agree

As observed in Table 4, the distribution of household responses exhibits a high concentration toward definite agreement or disagreement, with a minimal presence of neutral responses. This distribution pattern is an explicit result of the research design, which intentionally employed a forced-choice Likert scale (excluding a mid-point neutral option) to eliminate the tendency of respondents to seek a safe or ambiguous middle ground. This methodological approach forces a definitive stance regarding food accessibility, nutritional value, social acceptance, and economic resilience. To mitigate potential acquiescence bias or social desirability bias during data collection, interviews were conducted dynamically and independently by trained enumerators who refrained from leading the respondents' answers.

The distribution of respondents' perceptions of local sago food shows that respondents have a positive perception of the use of sago as a local food source. This can be seen from the majority of respondents who answered agree (A) and strongly agree (SA) on most of the research indicators. Respondents who answered agree ranged from 43% to 84%, and those who answered strongly agree ranged from 5% to 55%. In contrast, the negative responses shown through the disagree (D) category were relatively small and only for a few indicators, with percentages ranging from 10% to 48%, and there were no respondents who stated strongly disagree (SD) or neutral (N) towards the measured indicators. The high level of agreement among respondents indicates that households in Tidore have a positive view of sago as part of the local food system. Some respondents' statements even indicate a very high level of acceptance towards sago. Responses to the indicators of social acceptance and the economic value of sago: the majority of respondents agreed or strongly agreed, with a total percentage of over 90%. This research found that sago is not only viewed as an alternative food source but also holds significant social and economic value for households in island regions.

From a food security perspective, the role of sago not only contributes to food security, cultural preservation, and environmental sustainability but also enhances food diversification and reduces dependence on staple foods like rice. Additionally, the utilisation of sago has the potential to strengthen the local food system because sago plants are relatively adaptive to environmental conditions and have high productivity in island regions such as Tidore. Overall, the results of this study indicate that household perceptions of local sago as food fall into the positive to very positive category. This indicates that sago is still well-received by the community and has the potential to become an important component in supporting household food security. Thus, strengthening the utilisation of sago as a local food can become one of the strategies in enhancing the food independence of the community in Tidore.

Next, the analysis of household perceptions of local sago as food is conducted using the perception index method based on the respondents' answer scores for each research indicator. The index value is calculated by comparing the actual score with the maximum score using the perception index formula. The actual score is obtained from the total score of respondents' answers on each indicator, while the maximum score is obtained from the number of respondents multiplied by the highest score on the Likert

scale. Subsequently, the index value is classified into three categories: low (0–40), medium (41–70), and high (71–100) (Field A, 2013).

Table 5. Household perception index of local sago food in Tidore

Variable	Index (%)	Category
Access and Availability	76.74	High
Nutritional and Health Awareness	87.84	High
Social Acceptance	88.18	High
Economic Value and Food Security	85.97	High

The results of the perception index calculation show that, in general, households have a positive perception of local sago food. The access and availability variables have an index value of 76.74, which falls into the high category. This indicates that respondents consider sago relatively easy to access as a local food source. The variable of nutritional and health awareness has an index value of 87.84, indicating a high level of awareness among respondents regarding the health benefits of consuming sago. Additionally, the variable of cultural relevance and social acceptance has an index value of 88.18, indicating that sago still has a strong level of social acceptance in community life. Meanwhile, the variable of economic value and food security has an index value of 85.97, indicating that respondents view sago as having an important role in supporting household food security.

Table 6. Results of multiple regression analysis, the influence of age, education, income, and family size on sago perception

Variable	Coefficient (B)	Std. Error	t-Statistic	p-value
Age	2.31	0.98	2.36	0.021
Education	3.59	0.51	7.06	<0.001
Income	-1.97	1.21	-1.62	0.11
Household Size	5.19	1.06	4.91	<0.001

The results of the multiple linear regression analysis indicate that the socio-economic characteristics of households generally influence perceptions of local sago food, where the variables of age, education, and family size have a positive and significant impact, while income does not have a significant effect. The age variable has a coefficient of 2.31 with a p-value of 0.021 ($p < 0.05$), indicating that as respondents' age increases, their perception of sago tends to become more positive. The education variable shows the strongest influence with a coefficient of 3.59 and a p-value of < 0.001 , meaning that the higher the level of education, the better the household's perception of sago, especially in understanding its nutritional value and the importance of food diversification. Conversely, the income variable has a negative coefficient of -1.97 with a p-value of 0.11 ($p > 0.05$), indicating no significant effect, which suggests that the perception of sago is more influenced by non-economic factors such as culture and consumption habits. Meanwhile, the family size variable has a coefficient of 5.19 with a p-value of < 0.001 , indicating that the larger the number of household members, the

more positive the perception of sago, possibly due to considerations of consumption efficiency and the availability of local food. Overall, these findings affirm that socio-demographic factors are more dominant in shaping household perceptions of local food compared to economic factors.

Discussion

The research results show that the majority of households have a positive perception of the use of sago as a local food. This positive perception is also consistent with previous studies conducted by (Hanemaayer et al., 2020; Johnson et al., 2025; Loukes et al., 2021), which state that traditional foods are known for their significant contribution to indigenous communities. Additionally, the positive view: despite the obstacles, local food is still purchased as long as it is available (Shafiee et al., 2024). Furthermore, the findings of this study indicate a high level of agreement among respondents on almost all indicators, suggesting that sago still plays an important role in the community's food consumption system. The dominance of responses in the agree and strongly agree categories indicates that the community still views sago as a relevant food source in meeting household food needs. This is in line with previous research conducted by Kadir et al. (2022, 2024), which states that sago is a traditional food that plays a role in meeting daily needs. Moreover, these findings align with the concept of food security proposed by Fitriyah et al. (2025), which states that food security is not only related to food availability but also to access, utilisation, and the long-term stability of the food system. In this context, according to (Dewi et al., 2025; Kadir et al., 2024; Rahayu et al., 2023; Sidiq et al., 2022), the role of sago in supporting food diversity and sustainable local food systems is multifaceted, encompassing nutritional, economic, cultural, and environmental dimensions. Additionally, strengthening local sago-based management and addressing existing challenges can significantly contribute to achieving food security and sustainability goals.

The high level of social acceptance of sago also indicates that cultural factors have a significant influence on the food consumption patterns of the community. In many local communities, traditional food not only serves as a source of energy but also as part of the cultural identity and social system of the community (Báti, 2024; Grimaldi et al., 2018; Manik et al., 2024). Therefore, the high social acceptance of sago indicates that this local food still holds strong cultural legitimacy in the lives of the people in Tidore. In addition to social and cultural aspects, the research results also show that the community views sago as having significant economic value. Positive perceptions of the economic value of sago indicate that this commodity not only serves as a food source but also has the potential to be a source of income for the community.

This is in line with research showing that the utilisation of local food can contribute to the improvement of community welfare while also strengthening regional food security (Lanuhu et al., 2021; Pingali, 2015). Furthermore, local or traditional foods are considered economically very beneficial because they contribute to household income and serve as a safety net during food shortages (Galluzzi et al., 2025). Furthermore, the utilisation of sago as a local food source can also support food diversification strategies as an alternative to rice (Fetriyuna et al., 2024; Humaerah et al., 2020). A high

dependence on a single staple food, such as rice, can increase the vulnerability of the food system in the event of production or distribution disruptions. Therefore, one way to enhance community food security through the diversification of food sources is by developing and utilising local foods such as sago.

Furthermore, the results of the multiple linear regression analysis indicate that the influence of household socio-economic characteristics on the perception of local sago food is quite strong, with a coefficient of determination value of 0.547, which shows that 54.7% of household variation in sago can be explained by the variables of age, education, income, and household size. The research results indicate that age has a positive and significant effect on the perception of sago. These findings are consistent with (Grebitus et al., 2017; Memery et al., 2015; Tiganis & Tsakiridou, 2022) older individuals perceive local food as healthier and more nutritious. Additionally, age is positively correlated with the willingness to consume local food (Musadar & Abidin, 2020; Vávrová & Beran, 2025).

However, according to (Memery et al., 2015) The influence of age is moderated by other factors such as gender, local identity, and product type. Furthermore, according to (Vlontzos et al., 2018) There is a positive attitude towards local food, but there are doubts due to health reasons. Furthermore, education has a positive and significant impact on household perceptions of sago, where higher education levels correspond to more positive perceptions among respondents towards local sago. This is in line with the research conducted by Hernández, 2023; Rathu Manannalage et al., 2024 Strobel et al. (2014) that consumers with higher education levels tend to have a better awareness of the benefits of local food, such as nutritional value and support for the local economy. In line with (Dukeshire et al., 2015; Merle et al., 2016) Education also influences positive perceptions of the quality and authenticity of local food.

This is due to a better understanding of the importance of supporting local food systems and health benefits. However, this is contrary to the findings of the research conducted by (Maurice et al., 2019; Nurhayati, 2025; Šmugović et al., 2025). Stating that lower education levels tend to consume traditional foods more, especially in rural areas, while those with higher education prefer modern processed foods. This is supported by Deaconu et al. (2021), who state that higher education levels can lead to a shift from traditional practices influenced by urbanisation and the global food system.

Unlike other variables, the household income variable does not show an influence on households' perception of sago as a local food. This indicates that in the context of the local community, local foods like sago are viewed more through the lens of cultural proximity and consumption habits rather than household economic factors. Therefore, local food like sago becomes important from the community's perspective despite the diversity in household income. Next, family size has a positive and significant impact on household perceptions of sago as a local food. A larger number of household members tends to have a more positive perception of sago as a local food. This is consistent with research (Casado et al., 2025; Cele & Mkhize, 2025; Shi & Hodges, 2016) which states that larger family sizes are more dependent on local food because it is affordable and available locally, thereby influencing decisions and consumption preferences towards

local food. However, perceptions of local food are often influenced by psychological and spatial proximity to local food resources (Merle et al., 2016). Overall, the findings of this study indicate that the community highly appreciates the use of sago as a local food source. This shows that there is still great potential to be developed as part of the food security strategy in Tidore. With the right policies, strengthening of the production system, and increasing the economic value of sago products, this local food can become one of the important pillars of the national food security program.

CONCLUSION

This research shows that households in Tidore consider the use of sago as a good local food. The results of the descriptive statistical analysis show that all research variables have average values that fall within the high to very high category. These results indicate that respondents view sago as an important food source in terms of economic value, accessibility, nutritional awareness, and social and cultural acceptance. The results indicate that sago still has great potential to be developed as one of the local food sources to support household food security. Therefore, expanding the utilisation of sago through food diversification strategies, enhancing the economic value of sago products, and supporting local food policies can be important steps in strengthening the food security of the community in Tidore.

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