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Characterization of Agricultural Households Socioeconomic on Javanese and To Pekurehua Ethnic in Central Sulawesi Province

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Abstract: Central Sulawesi is categorized as a food and nutrition insecure area, due to drought, narrow land ownership, high population migration, and the absence of a non-agricultural economic sector. This study aims to analyze socio-economic factors household, namely Javanese and To Pekurehua (Napu valley). This research was conducted in Central Sulawesi Province in 2 sub-districts namely Napu Valley and Java. Sampling using simple random sampling method. Determination of the number of samples using the Slovin formula consisting of 120 respondents. Data collection using in-depth interviews and direct observation. Quantitative data processing by tabulating. Data analysis was conducted by: (1) Descriptive to answer socioeconomic characteristics; (2) Quantitative to answer meal frequency and measure food consumption. For household food security level, Food Expenditure Share calculation was used. The results showed that: The results showed: (1) Household food security is categorized as food resilient, with a share of food expenditure of less than 60%, namely 55.62% for to pekurehua (Lembah napu) and 56.68% for Java; (2) Social and economic factors that influence the ability to access adequate and nutritious food are household income, equitable distribution of food and adequate infrastructure. to pekurehua and Java ethnicities have similar characteristics in meeting food needs.

Keywords: Etnic; Food expenditure; Household; Socioeconomic

Introduction

Food security is a condition of sufficient food availability for everyone at any time and for every individual who has access to obtain it, both physically and economically. The focus of food security is not only on the provision of food at the regional level but also on the availability and consumption of food at the regional and household levels, and even for individuals in meeting their nutritional needs (Shamadiyah & Nasution, 2018; Sihite et al., 2021). This government policy on food security can be analyzed from the issuance of the Law of the Republic of Indonesia Number 7 of 1996 concerning Food. The law states that food security is the condition of fulfilling food for households which is reflected in the availability of sufficient food, both in quantity and quality, safe, equitable and affordable, then strengthened again by the issuance of Presidential Regulation of the Republic of Indonesia Number 83 of 2006 concerning the Formation of a Council Food Security (Arlius et al., 2017; Ritonga et al., 2022).

Vhurumuku (2014), stated that food security can be measured from two sides, namely dietary diversity and food frequency and consumption behaviors. Food diversity and eating frequency have several indicators:

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(1) food consumption score which measures calorie intake and food quality at the household level, (2) household dietary diversity scale, (3) malnutrition (undernourishment) and (4) the proportion of household spending on food (spending on food). Consumption behavior can be measured by: (1) coping strategies index, namely an index to measure what people will do if they cannot access enough food, (2) the household food insecurity and access scale, (3) the household hunger scale), and (4) self-assessed measure of food security.

Poso Regency is one of the areas in Central Sulawesi Province which has a population of 248,345 people with a total of 38,143 households. The status of food security in Poso Regency is included in the category of food and nutrition insecurity, the causal factor is due drought, narrow land ownership, high population migration, the absence of non-agricultural economic sectors and not being targeted by government programs in the context of tackling food and nutrition insecurity.

Food and nutrition problems are complex and interrelated issues and are caused by various factors, one of which is caused by food consumption factors, therefore, studies of socio-economic aspects, eating habits, and nutritional status of toddlers on food security households are very important to do for the development of programs to improve food and nutrition in the community. In this regard, an assessment of a community's food consumption pattern can be used as an effort to describe the state of food and nutrition in that community (Setiawan et al., 2018; Sedlander et al., 2021). According to Park et al. (2005) and Zhafirah et al. (2023), people's food consumption patterns are influenced by socio-cultural, demographic, and lifestyle factors, and are related to the risk of several degenerative diseases. Leyna et al. (2010) added that the pattern of community food consumption is significantly related to the condition of food insecurity or food security of the community.

This study aims to analyze socio-economic factors household, namely Javanese and To Pekurehua (Napu valley) ethnicities in Central Sulawesi Province.

Method

Location, Place and Time of Research

Napu valley District and West Jawa District in Poso Regency were chosen as research locations because there were many of them inhabited by To Pekurehua and Javanese ethnicity. This research was conducted for 10 months (February-November 2023), using a cross-section study. Methods of in-depth interviews/interviews with a number of respondents, traditional leaders and direct observation to look at socio-economic aspects, and food consumption patterns of the community within 6 months.

Sample Method

The population in this study is a total of 209 families in north Lore (Napu valley) and West Pamona sub Districts, totaling 175 families. Sampling was carried out using the Slovin formula using the terms CI = 95%, α = 0.05 (Rianse & Abdi, 2013). The results of using this equation obtained a sample of 79 respondents from north Lore sub-district (representing etnic To Pekurehua) and 41 respondents from west Pamona sub-district (representing etnic Jawa).

Data Collection Method

The data taken in this study includes primary data, namely data obtained directly from respondents. Secondary data, namely data obtained from literature and other sources (Sugiyono, 2014). Quantitative data were obtained from direct interviews with respondents using structured questionnaires. Output from questionnaire is data on household socio-economic characteristics (RT).

Table 1. Types and Research Data Collection Methods

Variable	Methods of data collection
Household socio-economic characteristics	Structured interview using a questionnaire
Age of head of family Age of Housewives Numbers of household members	Respondents: husband and wife
Parents Educational level	
Parents Occupation	
Parents Income	
Household Expenditure (food and non food)	

Qualitative primary data was obtained through interviews with informants consisting of: housewife, head household, heads of RT/village heads, religious leaders, and traditional leaders. Secondary data were obtained from agencies relevant to this research, such as: the Central Bureau of Statistics for Poso Regency, the Livestock Service Office, the Food Security Service, and the Agriculture Office for Poso Regency, as well as the district office. Secondary data collection was conducted to collect data related to topography, food production and availability, access to food for the population.

Analysis Data Method

Quantitative data processing is done by creating a master table. Data that has been collected of entries, then done editing and cleaning. Editing is done on data that is not in accordance with the questionnaire, while cleaning data is done on data that is extreme and not plausible.

Data on household socio-economic characteristics, household food availability, physical access, and socio-cultural nutrition were tabulated and analyzed descriptively. Data regarding food frequency used to analyze food habits and measure food consumption qualitatively is determined using food frequency questionnaire (FFQ). To address the first objective, which is to determine the level of household food security in Napu valley and West Jawa districts using the calculation of the Food Expenditure Share, which is the comparison of food expenditure with the total household expenditure (Maxwell et al., 1992). The Food Expenditure Share can be formulated as follows:

$$PPP = \frac{FE}{TE} X\ 100\% \quad (1)$$

Information:
PPP = Food Expenditure Share (%)
FE = Expenditure on Food (Rp/Year)
TE = Total Household Expenditure (Rp/Year)

Furthermore, Jonsson and Toole categorize household food security based on the calculation of the food expenditure share. There are two categories: (a) A household is classified as food secure if its food expenditure share is less than 60%; (b) A household is classified as food insecure if its food expenditure share is more than 60% (Maxwell et al., 1992).

Result and Discussion

Household Socio-Economic Characteristics
Household Characteristics

Table 2 displays the sociodemographic characteristics of respondents. The average age of fathers is 41.15 ± 13.081, and the average age of mothers is 36.14 ± 12.031, with the highest number found in the To Pekurehua area. Fathers of to Pekurehua ethnicity have the highest number, with 43 people (54.4%) living in the To Pekurehua (rural) area and 35 people (85.4%) living in Jawa (rural). The highest number of mothers of to Pekurehua ethnicity is 42 people (53.2%) living in the to Pekurehua (rural) area, while 36 people (86.7%) of Javanese ethnicity live in Jawa (rural). The highest number of fathers' education levels was found in 42 people (53.2%) living in the to Pekurehua (rural) area and 16 people (39%) in the Jawa (rural) area, while the highest number of mothers' education levels was found in 37 people (46.8%) living in the to Pekurehua (rural) area and 15 people (36.6%) living in the Jawa (rural) area. The highest number of employment status (work status) of family members aged ≥15 years is 64 people (81%) in the to Pekurehua (rural) area and 30 people (73.2%) in the Jawa (rural) area. The highest number of fathers' occupations in the to Pekurehua (rural) area is 64 people (63.6%) as farmers (farm laborers), while the highest number of fathers' occupations in the Jawa (rural) area is farmers with 30 people (73.2%). The highest number of mothers' occupations is 50 people who are not working (63.3%) in the to Pekurehua (rural) area, while the highest number of mothers' occupations in the Jawa (rural) area is 22 people who are not working (53.7%).

Table 2. Sociodemographic Characteristics of the Households in Central Sulawesi

Sociodemographic Characteristics	To Pekurehua (n= 79)	Jawa (n= 41)	Total (n = 120)
Number of household members (person), mean ± SD	3.91 ± 1.221	3.49 ± 1.098	3.77 ± 1.193
Employment status of family members ≤ 15 years of age, n (%)			
- Employed	77 (97.5)	40 (97.6)	117 (97.5)
- Employed, but temporarily laid off	0 (0.0)	0 (0.0)	0 (0.0)
- Unemployed, just recently laid off	2 (2.5)	1 (2.4)	3 (2.5)

Based on the sociodemographic characteristics of the respondents' households, the highest education level of fathers is graduating from high school, with 42 people (53.2%) living in the To Pekurehua (rural) area and 16 people (39%) living in the Jawa (rural) area. The highest education level of mothers is also graduating from high school, with 37 people (46.8%) living in the To Pekurehua (rural) area and 15 people (36.6%) living in the Jawa (rural) area. The highest employment status of family members aged ≥15 years (from employment status) is 64 people (81%) in the To Pekurehua (rural) area and 30 people (73.2%) in the Jawa (rural) area.

The highest number of fathers' occupations in the To Pekurehua (rural) area is farmers/farm laborers, with 64 people (81%), and the highest number of fathers' occupations in the Jawa (rural) area is farmers, with 30 people (73.2%). Meanwhile, the highest number of mothers' occupations in the To Pekurehua (rural) area is not working, with 50 people (63.3%), and the highest

number of mothers' occupations in the Jawa (rural) area is also not working, with 22 people (53.7%).

Table 3. Sociodemographic Characteristics of the Fathers in Central Sulawesi

Sociodemographic Characteristics	To Pekurehua (n= 79)	Jawa (n= 41)	Total (n = 120)
Age (year), mean ± SD	41.15 ± 13.081	42.61 ± 14.55	41.65 ± 13.559
Ethnicity, n (%)			
- Sunda	0 (0.0)	0 (0.0)	0 (0.0)
- Jawa	0 (0.0)	35 (85.4)	35 (29.2)
- Bali	0 (0.0)	1 (2.4)	1 (0.8)
- Bugis	0 (0.0)	0 (0.0)	0 (0.0)
- Kaili	0 (0.0)	0 (0.0)	0 (0.0)
- Dampelas	0 (0.0)	0 (0.0)	0 (0.0)
- Makasar	0 (0.0)	0 (0.0)	0 (0.0)
- Makasar	0 (0.0)	0 (0.0)	0 (0.0)
- Gorontalo	0 (0.0)	0 (0.0)	0 (0.0)
- Minahasa	0 (0.0)	0 (0.0)	0 (0.0)
- Jawa	0 (0.0)	4 (9.8)	4 (3.3)
- Saluan	0 (0.0)	0 (0.0)	0 (0.0)
- Lauje	0 (0.0)	0 (0.0)	0 (0.0)
- Tikato	0 (0.0)	1 (2.4)	1 (0.8)
- Toli-toli	0 (0.0)	0 (0.0)	0 (0.0)
- Bada	1 (1.3)	0 (0.0)	1 (0,8)
- To Pekurehua	43 (54.4)	0 (0.0)	43 (35.8)
- Manado	3 (3.8)	0 (0.0)	3 (2.5)
- Mori	2 (2.5)	0 (0.0)	2 (1.7)
- Napu	21 (26.6)	0 (0.0)	21 (17.5)
- Rampi	2 (2.5)	0 (0.0)	2 (1.7)
- Topo Baria	2 (2.5)	0 (0.0)	2 (1.7)
- Toraja	5 (6,3)	0 (0.0)	5 (4.2)
- Besoa	0 (0.0)	0 (0.0)	0 (0.0)
- Kulawi	0 (0.0)	0 (0.0)	0 (0.0)
- Luwuk	0 (0.0)	0 (0.0)	0 (0.0)
- Seko	0 (0.0)	0 (0.0)	0 (0.0)
Education, n (%)			
- Did not go to school	0 (0.0)	0 (0.0)	2 (1.7)
- Did not finish elementary school	2 (2.5)	0 (0.0)	0 (0.0)
- Graduated from elementary school	9 (11.4)	15 (36.6)	24 (20.0)
- Graduated from junior high school	22 (27.8)	9 (22)	31 (25.8)
- Graduated from senior high school	42 (53.2)	16 (39)	58 (48.3)
- Graduated from vocational school	1 (1.3)	0 (0.0)	1 (0.8)
- Graduated from higher education	3 (3.8)	1 (2.4)	4 (3.3)
Occupation, n (%)			
- Unemployed	2 (2.5)	1 (2.4)	3 (2.5)
- School	0 (0.0)	0 (0.0)	0 (0.0)
- Civil servant	4 (5.1))	2 (4.9)	6 (5)
- Private sector employee	3 (3.8)	4 (9.8)	7 (5.8)
- Entrepreneur	3 (3.8)	2 (4.9)	5 (4.2)
- Farmer	64 (81))	30 (73.2)	94 (78.3)
- Laborer/driver/domestic helper	2 (2.5)	2 (4.9)	4 (3.3)
- Others	1 (1.3)	0 (0.0)	1 (0.8)

A study found that heads of households with an education level above a primary school (SD) diploma have 1.59 times higher food security compared to households whose heads do not have a primary school (SD) diploma (Devi et al., 2020). According to Soekirman (2006) and Taruvinga et al. (2013), the element of education is closely related to knowledge about health and nutrition. Additionally, education can influence an individual's learning process; the higher a person's education level, the easier it is for them to accept existing information. The more information received, the more knowledge gained, including information about health. The average education level of housewives in the study area is mostly graduated (graduated from primary

school, junior high school, and high school), indicating a high education category, which allows housewives to easily access information about nutrition for toddlers.

The type of occupation is dominated by housewives, with 72 people (60%), which can explain that being a housewife provides ample time to accompany and care for their toddlers.

Table 4. Sociodemographic Characteristics of the Mothers in Central Sulawesi

Sociodemographic Characteristics	To Pekurehua (n= 79)	Jawa (n= 41)	Total (n = 120)
Age (year), mean ± SD	36.14 ± 12.031	37.61 ± 13.14	36.64 ± 12.38
Ethnicity, n (%)			
- Sunda	0 (0.0)	0 (0.0)	0 (0.0)
- Jawa	1 (1.3)	36 (87.48)	37 (30.8)
- Bali	0 (0.0)	3 (7.3)	3 (7.3)
- Bugis	2 (2.5)	0 (0.0)	2 (1.7)
- Kaili	1 (1.3)	0 (0.0)	1 (0.8)
- Dampelas	0 (0.0)	0 (0.0)	0 (0.0)
- Makasar	0 (0.0)	0 (0.0)	0 (0.0)
- Gorontalo	0 (0.0)	0 (0.0)	0 (0.0)
- Minahasa	0 (0.0)	0 (0.0)	0 (0.0)
- Jawa	0 (0.0)	2 (4.9)	2 (1.7)
- Saluan	0 (0.0)	0 (0.0)	0 (0.0)
- Lauje	0 (0.0)	0 (0.0)	0 (0.0)
- Tikato	0 (0.0)	0 (0.0)	0 (0.0)
- Toli-toli	0 (0.0)	0 (0.0)	0 (0.0)
- Bada	0 (0.0)	0 (0.0)	0 (0.0)
- To Pekurehua	42 (53.2)	0 (0.0)	42 (35.0)
- Manado	1 (1.3)	0 (0.0)	1 (0.8)
- Mori	0 (0.0)	0 (0.0)	0 (0.0)
- Napu	23 (29.1)	0 (0.0)	23 (19.2)
- Rampi	2 (2.5)	0 (0.0)	2 (1.7)
- Topo Baria	2 (2.5)	0 (0.0)	2 (1.7)
- Toraja	1 (1.3)	0 (0.0)	1 (0.8)
- Besoa	1 (1.3)	0 (0.0)	1 (0.8)
- Kulawi	1 (1.3)	0 (0.0)	1 (0.8)
- Luwuk	1 (1.3)	0 (0.0)	1 (0.8)
- Seko	1 (1.3)	0 (0.0)	1 (0.8)
Education, n (%)			
- Did not go to school	2 (2.5)	0 (0.0)	2 (1.7)
- Did not finish elementary school	0 (0.0)	2 (4.9)	2 (1.7)
- Graduated from elementary school	16 (20.3)	12 (29.3)	28 (23.3)
- Graduated from junior high school	20 (25.3)	10 (24.4)	30 (25)
- Graduated from senior high school	37 (46.8)	15 (36.6)	52 (43.3)
- Graduated from vocational school	0 (0.0)	0 (0.0)	0 (0.0)
- Graduated from higher education	4 (5.1)	2 (4.9)	6 (5)
Occupation, n (%)			
- Unemployed	50 (63.3)	22 (53.7)	72 (60)
- School	0 (0.0)	1 (2.4)	1 (0.8)
- Civil servant	0 (0.0)	7 (17.1)	7 (5.8)
- Private sector employee	5 (6.3)	2 (4.9)	7 (5.8)
- Entrepreneur	1 (1.3)	1 (2.4)	2 (1.7)
- Farmer	20 (25.3)	7 (17.1)	27 (22.5)
- Labourer/driver/domestic helper	1 (1.3)	0 (0.0)	1 (0.8)
- Others	2 (2.5)	1 (2.4)	3 (2.5)

Household Economic Characteristics

Table 5 showed household income and expenditure, with an average income (IDR/person /month) of IDR 2,094,721 in the To Pekurehua (rural) area and IDR 1,815,032.54 in the Jawa (rural) area. In the To Pekurehua (rural) area, the total average expenditure (IDR/person/month) is IDR 3,017,058, with the highest expenditure found in the food expenditure category, amounting to IDR 1,678,224. Meanwhile, in the Jawa (rural) area, the total average expenditure

(IDR/person/month) is IDR 3,431,510.98, with the highest expenditure found in the food expenditure category, amounting to IDR 1,945,004.88. The highest proportion of expenditure in the food category is 46.82% in the To Pekurehua (rural) area and 23.62% in the Jawa (rural) area. Based on the calculation of the food expenditure share, households in To Pekurehua have a share of 55.62% and in West Jawa, 56.68%. Therefore, these households fall into the food secure category as they have a food expenditure share of less than 60% (Maryadi & Dermawan, 2019).

The average income (IDR/person/month) is IDR 2,094,721 in the To Pekurehua (rural) area and IDR 1,815,032.54 in the Jawa (rural) area, with the total average expenditure being IDR 3,017,058, where the highest average expenditure is found in the food category, amounting to IDR 353,526.13 in the To Pekurehua (rural) area. In the Jawa (rural) area, the total average expenditure (IDR/person/month) is IDR 3,431,510.98, with the highest average expenditure found in the food category, amounting to IDR 1,945,004.88. The highest proportion of food expenditure in the To Pekurehua (rural) area is 46.82%, and in the Jawa (rural) area, it is 23.62%.

Another study reported that households with good economic conditions have a better ability to purchase various types of food supplies, even when rice prices in the market increase or when food prices rise. Income has a significant impact on consumption patterns. The influence of income is also explained in demand theory; a person's income affects the demand for goods and services. When income changes, it affects the amount of consumption. According to research by Safia et al. (2018), income positively influences consumption patterns. The higher the income level, the higher and more diverse the consumption patterns (Safia et al., 2018; Sitanaya et al., 2019).

Prices and consumption patterns are interrelated, which aligns with the law of demand. As the price of goods increases, consumers' willingness to purchase those goods decreases (Pindyck & Rubinfeld, 2014; Wahyuni & Fitrayuna, 2020). However, the relationship is different for essential goods because essential and non-essential goods have different utilities and priority scales.

Income has a very strong influence on consumption patterns. With increasing income, people will have more opportunities to improve the quality, quantity, and variety of the goods they purchase.

Table 5. Household Income and Expenditure (IDR/Cap/Month) in Central Sulawesi

Household income and expenditure	To Pekurehua (n= 79)	Jawa (n= 41)	Total (n = 120)
Income (IDR/cap/month), mean ± SD	2,094,721 ± 1,767,428	1,815,032.54 ± 1,364,750.85	1.999.161,12 ± 1,640,531.75
Expenditure (IDR/cap/month), mean ± SD			
Food	1,678,224 ± 771,268	1,945,004.88 ± 658,723.64	1,761,532.13 ± 756,550.11
Non-Food	1,338,834 ± 1,383,666	1.486.606,1 ± 748.302,34	1,389,322.99 ± 1,203,361.23
Total Expenditure	3,017,058 ± 1,785,281	3.431,610.98 ± 1,170,666.86	3,158,697.28 ± 1,608,958.72
Proportion of Expenditure, (%)			
Food	55.62	56.68	55.77
Non-Food	44.38	43.32	43.98

Table 5 shows the details of household expenditure (IDR/Person/Month). The food expenditure category in the To Pekurehua (rural) area ranges from the highest to the third highest as follows: expenditure on food ingredients (rice, corn, flour, etc.) amounting to IDR 436,075, expenditure on cigarettes amounting to IDR 198,253, and expenditure on fish/shrimp/squid/crab amounting to IDR 229,240, with the total average expenditure for the food category being IDR 1,678,224.

Meanwhile, in the Jawa (rural) area, the food expenditure category ranges from the highest to the third highest as follows: expenditure on food ingredients (rice, corn, flour, etc.) amounting to IDR 454,682.93, expenditure on cigarettes amounting to IDR 161,926.82, and expenditure on fish/shrimp/squid/crab amounting to IDR 213,414.63, with the total average expenditure for the food category being IDR 1,945,004.87.

The expenditure share indicates that household food security falls into the food secure category, showing that households spend their entire income on food needs, with a food expenditure share value of less than 60%. The research findings also explain that besides the food expenditure share as one of the indicators determining the level of food security, household food security is also influenced by socioeconomic factors such as the level of education, awareness of healthy living, availability of more diverse foods, and consumption patterns. These factors make it easier for households to choose foods according to nutritional principles, preferences, and the fulfillment of social and taste needs.

Table 6 explains that in the non-food category, the highest average expenditure is for taxes, local contributions (environmental fees), social gatherings, government health insurance (BPJS), loan installments, and loans, amounting to IDR 287,907. The second

highest expenditure is for special occasions (parties, funerals, etc.), amounting to IDR 200,571. The third highest expenditure is for fuel (gasoline, diesel), amounting to IDR 199,518. Thus, the total average expenditure for the non-food category is IDR 1,338,834 in the To Pekurehua (rural) area.

Table 6. Details of Household Food Expenditure (IDR/Cap/Month) in Central Sulawesi

Household food expenditure, mean ± SD	To Pekurehua (n= 79)	Jawa (n= 41)	Total (n = 120)
Grains and cereals	436,075 ± 235,236	454,682.93 ± 131,613.53	442,433.33 ± 205,358.13
Tubers	19,955 ± 45,845	43,048.78 ± 65,008.44	27,845.83 ± 54,029.04
Fish and seafoods	229,240 ± 228,112	213,414.63 ± 283,318.37	223,833.33 ± 247,275.68
Meats	79,283 ± 99,878	92,541.46 ± 87,107.45	83,813.47 ± 95,546.05
Eggs	86,075 ± 89,399	111,560.97 ± 98,992.43	94,783.33 ± 93,166.08
Milk and its processed products	57,746 ± 116,033	170,463.41 ± 189,376.35	96,258.33 ± 154,148.16
Vegetables	65,607 ± 88,243	130,682.92 ± 111,125.47	87,841.67 ± 101,071.73
Legumes	91,240 ± 106,578	118,780.48 ± 96,285.9	100,650 ± 103,603.69
Fruits	48,468 ± 75,527	56,414.63 ± 50,909.71	51,183.33 ± 68,004.19
Cooking oil	81,632 ± 51,023	99,853.65 ± 54,377.64	87,858.33 ± 52,684.77
Beverages	124,303 ± 140,106	104,195.12 ± 124,724.33	117,433.33 ± 134,860.32
Spices	73,886 ± 69,105	81,219.51 ± 58,446.34	76,391.67 ± 65,502.62
Snacks (incl. one dish meal and processed food)	65,987 ± 101,662	49,097.56 ± 46,828.3	60,216.67 ± 87,041.59
Packaged beverages	15,793 ± 42,629	53,073.17 ± 45,611.06	28,530.55 ± 46,964.63
Beverages containing alcohol	4,672 ± 20,850	4,048.78 ± 11,592.99	4,459.43 ± 18,172.13
Cigarette	198,253 ± 248,347	161,926.82 ± 205,840.03	185,841.67 ± 234,452.15
Total food	1,678,224 ± 771,268	1,945.004.87±658,723.63	1,761,532.13 ± 756,550.11

Meanwhile, in the Jawa (rural) area, the highest average expenditure for the non-food category is for taxes, local contributions (environmental fees), social gatherings, government health insurance (BPJS), loan installments, and loans, amounting to IDR 215,400. The second highest expenditure is for transportation and accommodation, amounting to IDR 202,195.12. The third highest expenditure is for fuel (gasoline, diesel), amounting to IDR 201,073.17, with the total average expenditure for the non-food category being IDR 1,486,606.09.

Table 7. Details of Household Non-Food Expenditure (IDR/Cap/Month) in Central Sulawesi

Household food expenditure, mean ± SD (%)	To Pekurehua (n= 79)	Jawa (n= 41)	Total (n = 120)
Housing and household facilities:			
- Rent, maintenance, minor repairs	23,392 ± 93,556	15,853.65 ± 72,834.59	20,816.66 ± 86,793.77
- Electricity	61,291 ± 74,814	93,707.31 ± 79,360.01	72,366.66 ± 77,614.85
- Water	14,734 ± 19,557	16,500 ± 31,586.78	15,337.50 ± 24,223.50
- Fuel	199,518 ± 163,240	201,073.17 ± 136,938.74	200,050 ± 154,175.65
- Gas	110,784 ± 271,975	77,024.39 ± 40,710.86	99,250 ± 222,037.29
- Charcoal, firewood, etc	1,012 ± 6,323	3,195.12 ± 9,550.44	1,758.33 ± 7,612.457540
- Communications	64,075 ± 76,717	75,926.82 ± 52,118.80	68,125 ± 69,301.62
Hygiene and sanitation products:			
- Bath soap, toothpaste, toothbrush, shampoo, laundry soap, etc	80,493 ± 75,013	67,926.82 ± 43,313.04	76,200 ± 65,990.27
- Beauty products (incl. sanitary pads)	37,148 ± 45,230.331	47,700 ± 48,528.34	40,753.75 ± 46,451.92
Health costs (hospital, doctors, medicine)	33,843 ± 7,1456.103	46,560.97 ± 55,420.23	38,188.60 ± 66,451.95
Education costs	101,822 ± 160,855	144,553.65 ± 142,606.95	116,422.5 ± 155,594.65
Transportation and accommodations	29,354 ± 93,429	202,195.12 ± 360,614.14	88,408.33 ± 237,085.15
Wage of domestic helpers	16,210 ± 60,083	35,823.17 ± 116,080.39	22,911.8 ± 83,562.81
Clothing and footwear	77,670 ± 121,997	55,385.36 ± 43,201.64	70,056.64 ± 102,447.42
Taxes, levies, loans, instalments	286,907 ± 983,464	215,400 ± 294,418.32	262,475.82 ± 815,021.88
Special expenses (party, ceremony, funeral, etc)	200,571 ± 434,194	187,780.48 ± 320,440.29	196,201.36 ± 397,646.92
Total	1,338,834 ± 1,383,666	1,486,606.09 ± 748,302.33	1,389,322.99 ± 1,203,361.23

Conclusion

Household Food Security in To Pekurehua and West Jawa based on the share of food expenditure is in the food secure category, with the food expenditure share being less than 60%, namely 55.62% for To Pekurehua District and 56.68% for Jawa District. Social and economic factors such as household income,

equitable food distribution, and adequate infrastructure affect individuals' ability to access sufficient and nutritious food. Ethnic differences in food security, both To Pekurehua and Javanese ethnic groups, have almost the same characteristics in fulfilling food needs. Household food security exists in all ethnicities and is influenced by cultural interactions with gender, family, and decision-making factors. Household size, food expenditure, father's non-employee job, working mother, low maternal education, energy adequacy, protein adequacy, mother/daughter eating last, menu decision-making, individual decision-making regarding the amount of food, individual decision-making regarding food costs, have no relation to the determinants of household food and nutrition insecurity in Central Sulawesi Province.

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Author Contributions
R.A.R., L.D., E.R. and A.R.: Conceptualization, developing ideas, analyzing, writing, reviewing, responding to reviewers' comments; C.A.S., S.R.M., H.S.: analyzing data, overseeing data collection, reviewing scripts, and writing; M.K.: analyzing data, reviewing scripts, and writing.

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Conflicts of Interest
The authors declare no conflict of interest.

References

Arlius, A., Sudargo, T., & Subejo, S. (2017). Hubungan Ketahanan Pangan Keluarga Dengan Status Gizi Balita (Studi Di Desa Palasari Dan Puskesmas Kecamatan Legok, Kabupaten Tangerang). *Jurnal Ketahanan Nasional*, *23*(3), 359–373. https://doi.org/10.22146/jkn.25500

Devi, S., Warasniasih, N. M. S., Masdiantini, P. R., & Musmini, L. S. (2020). The Impact of COVID-19 Pandemic on the Financial Performance of Firms on the Indonesia Stock Exchange. *Journal of Economics, Business, & Accountancy Ventura*, *23*(2), 226–242. https://doi.org/10.14414/jebav.v23i2.2313

Leyna, G. H., Mmbaga, E. J., Mnyika, K. S., Hussain, A., & Klepp, K. I. (2010). Food insecurity is associated with food consumption patterns and anthropometric measures but not serum micronutrient levels in adults in rural Tanzania. *Public Health Nutrition*, *13*(9), 1438–1444. https://doi.org/10.1017/S1368980010000327

Maryadi, A., & Dermawan, E. S. (2019). Pengaruh Ukuran Perusahaan, Financial Leverage, Dan Liquidity Terhadap Kinerja Keuangan. *Jurnal Paradigma Akuntansi*, *1*(3), 572–579. https://doi.org/10.24912/jpa.v1i3.5560

Maxwell, S., & Frankenberger, T. R. (1992). *Household food security: Concepts, indicators, measurements. A technical review*. UNICEF/IFAD.

Park, S. Y., Murphy, S. P., Wilkens, L. R., Yamamoto, J. F., Sharma, S., Hankin, J. H., Henderson, B. E., & Kolonel, L. N. (2005). Dietary patterns using the food guide pyramid groups are associated with sociodemographic and lifestyle factors: The multiethnic cohort study. *Journal of Nutrition*, *135*(4), 843–849. https://doi.org/10.1093/jn/135.4.843

Pindyck, R. S., & Rubinfeld, D. L. (2014). *Microeconomics* (8th ed). Erlangga.

Rianse, U., & Abdi. (2013). *Metodologi Penelitian Sosial dan Ekonomi-Teori dan Aplikasi* (1st ed.). Alfabeta.

Ritonga, A. A., Rahmadani, N., Ramdhani, R., & Melisa, W. (2022). Peran Ibu Dalam Menjaga Ketahanan Pangan Keluarga. *Abdi Cendekia*, *1*(3), 76–82. https://doi.org/10.61253/abdicendekia.v1i3.78

Safia, L. S., Suyadi, B., & Ani, H. M. (2018). Pengaruh Pendapatan Terhadap Pola Konsumsi Petani Padi Pada Kelompok Tani Ngudi Rejeki Di Desa Wonorejo Kecamatan Kencong Kabupaten Jember. *Jurnal Pendidikan Ekonomi: Jurnal Ilmiah Ilmu Pendidikan, Ilmu Ekonomi Dan Ilmu Sosial*, *12*(1), 75–81. https://doi.org/10.19184/jpe.v12i1.7590

Sedlander, E., Talegawkar, S., Ganjoo, R., Ladwa, C., DiPietro, L., Aluc, A., & Rimal, R. N. (2021). How gender norms affect anemia in select villages in rural Odisha, India: A qualitative study. *Nutrition*, *86*, 111159. https://doi.org/10.1016/j.nut.2021.111159

Setiawan, E., Machmud, R., & Masrul, M. (2018). Faktor-Faktor yang Berhubungan dengan Kejadian Stunting pada Anak Usia 24-59 Bulan di Wilayah Kerja Puskesmas Andalas Kecamatan Padang Timur Kota Padang Tahun 2018. *Jurnal Kesehatan Andalas*, *7*(2), 275–284. https://doi.org/10.25077/jka.v7i2.813

Shamadiyah, N., & Nasution, P. P. P. A. (2024). Peran Perempuan Dalam Ketersediaan Pangan Rumahtangga (Studi Kasus Pada Masyarakat Petani Padi Di Gampong Blang Pala, Kecamatan Banda Baro, Kabupaten Aceh Utara, Provinsi Aceh). *Agrifo: Jurnal Agribisnis Universitas*

Malikussaleh, 3(2), 45-54. https://doi.org/10.29103/ag.v3i2.1105

Sihite, N. W., Nazarena, Y., Ariska, F., & Terati, T. (2021). Analisis Ketahanan Pangan dan Karakteristik Rumah Tangga dengan Kejadian Stunting. *Jurnal Kesehatan Manarang*, *7*(Khusus), 59–66. https://doi.org/10.33490/jkm.v7ikhusus.550

Sitanaya, F., Aspatria, U., & Boeky, D. L. A. (2019). Hubungan Faktor Sosial Ekonomi Dengan Ketahanan Pangan Rumah Tangga Pedagang Sayur Eceran di Pasar Oeba. *Timorese Journal of Public Health*, *1*(3), 115–123. https://doi.org/10.35508/tjph.v1i3.2138

Soekirman. (2006). *Hidup Sehat Gizi Seimbang dalam Siklus Kehidupan Manusia*. Primamedia Pustaka.

Sugiyono. (2014). *Metode Penelitian Pendidikan Pendekatan Kuantitatif, Kualitatif, dan R&D.* Alfabeta.

Taruvinga, A., Muchenje, V., & Mushunje, A. (2013). Determinants of rural household dietary diversity: The case of Amatole and Nyandeni districts, South Africa. *International Journal of Development and Sustainability, 2*(4), 2233-2247. Retrieved from https://www.isdsnet.com/ijds-v2n4-4.pdf

Vhurumuku, E. (2014). Food security Indicators. In *Workshop on integrating nutrition and food security programming for emergency response: Food and Agriculture Organization (FAO)*. Retrieved from https://www.fao.org/fileadmin/user_upload/food-security-capacity-building/docs/Nutrition/NairobiWorkshop/5.WFP_IndicatorsFSandNutIntegration.pdf

Wahyuni, D., & Fitrayuna, R. (2020). Pengaruh sosial ekonomi dengan kejadian stunting di desa kulau tambang kampar. *Preportif : Jurnal Kesehatan Masyarakat*, *4(*1), 20–26. https://doi.org/10.31004/prepotif.v4i1.539

Zhafirah, H. D., & Muniroh, L. (2023). Hubungan Berat Badan Lahir Dan Tingkat Kecukupan Zat Gizi Makro Dengan Status Gizi Balita. *Jurnal Kesehatan Tambusai*, *4*(4), 5948–5957. https://doi.org/10.31004/jkt.v4i4.19688