

# Determine of Household Food Security Headed by Women



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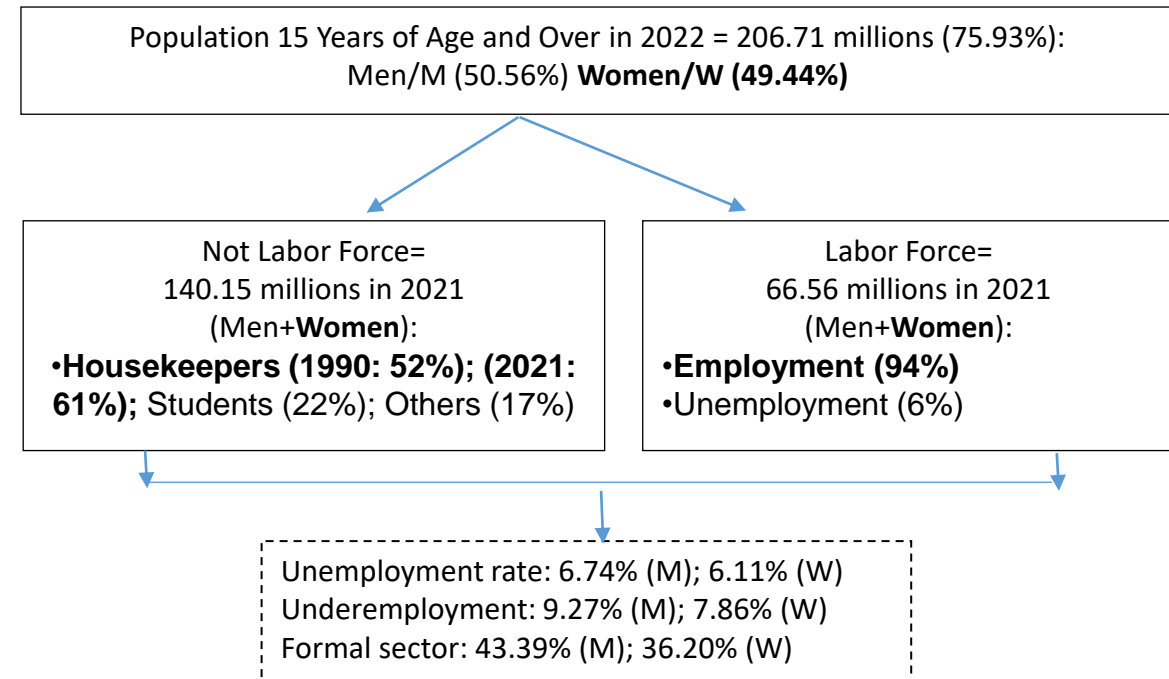
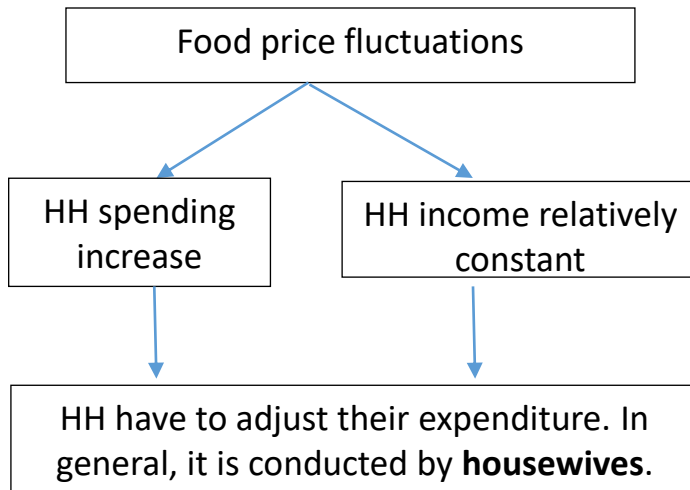
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# Introduction

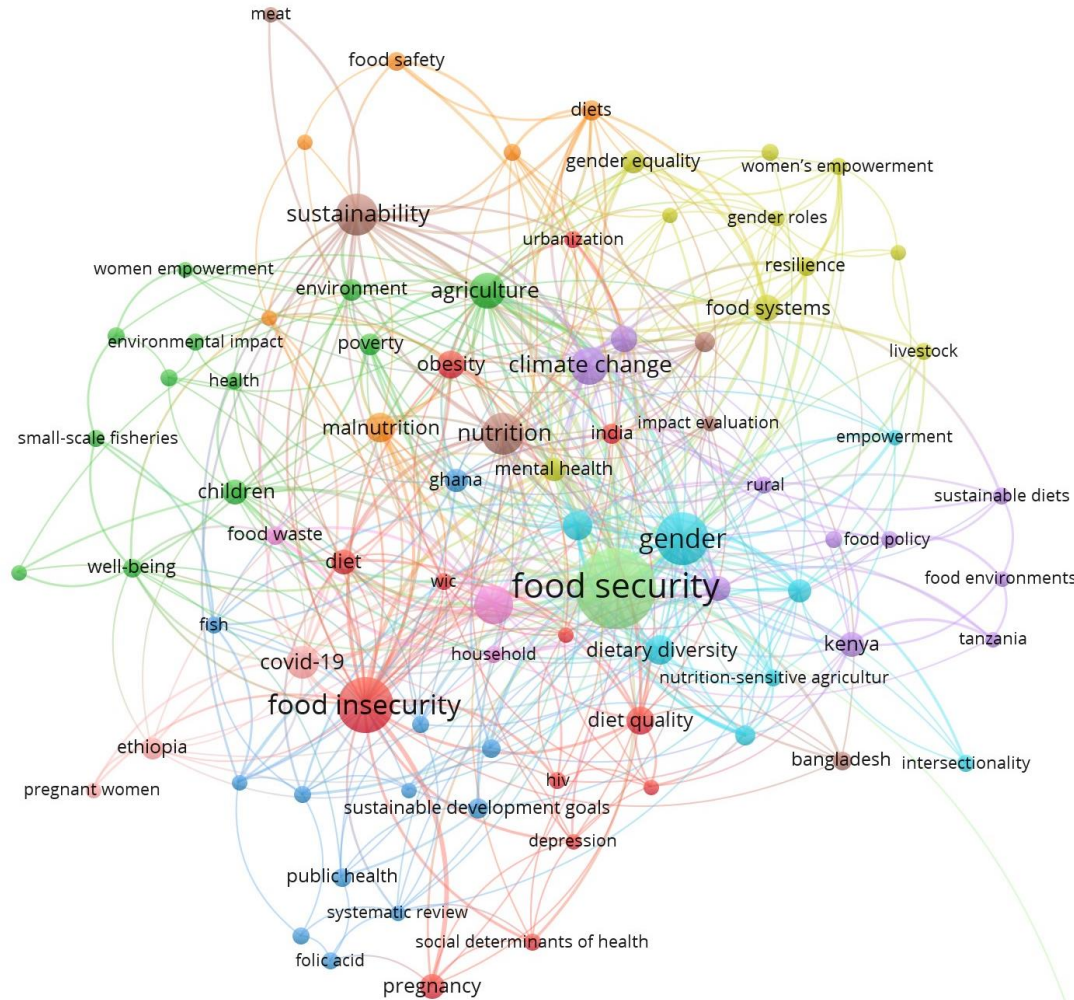
## Food Sustainability Index (FSI) and Global Food Security Index (GFSI) in 2022

Countries	FSI				GFSI				
	Score	Food loss and waste	Sustainable agriculture	Nutritional challenges	Score	Affordability	Availability	Quality and Safety	Sustainability and Adaption
India	62	55	64	65	58.9	59.3	62.3	62.1	51.2
Philippines	60	58	60	60	59.3	71.5	55.2	65.3	41.8
Indonesia	59	51	70	55	60.2	81.4	50.9	56.2	46.3
Nigeria	59	55	60	61	42.0	25.0	39.5	55.6	53.7
Vietnam	58	48	69	58	67.9	84.0	60.7	70.2	52.2

- FSI: Indonesia has abundant resource availability. However, nutritional adequacy is still a problem.
- GFSI: Indonesia's food price affordability is considered quite good. However, several other indicators, such as supply availability, quality and safety, and food sustainability and adaptation, still need to be stronger.
- Food sustainability includes:
  - a. ensures stability, reliability, and affordability for everyone
  - b. developing food systems resilient to climate change and natural disasters → price fluctuations.



- Price fluctuations can affect food access, especially in low-income and unstable households.
- Female labor participation rate was lower than male. Women tend to work in the informal sector, low value-added primary sector, and as voluntary workers.
- These factors can disrupt income and significantly impact expenditure allocation, particularly for women who are breadwinners.
- Any disruption in their income can threaten food security, leading to hunger as they struggle to afford basic needs for all family members.



## Previous studies:

1. Did not focus on women as breadwinners → female labor participation is still low and unstable, and there is a significant role of women in serving food in the household.
2. The determinants are only in terms of respondents' demographics and do not include the influence of government assistance → social security programs such as the Family Hope Program (PKH).

## **The goals:**

- 1) Analyze the pattern of food expenditure, the level of food consumption, and the level of food security headed by a woman.
- 2) Analyze the determinants of the share of food expenditure and the level of food security in households headed by a woman.



# Data and Methodology

- Data: Susenas in 2022.
- Number of respondents of women as household heads: 15,619 who are single (694), married (1,474), divorced (2,532), and widowed (10,919)

## Method for goal no. 1:

$$\text{Share of Food Expenditure (SFE)} = \frac{\text{Food Expenditure} \left( \frac{\text{USD}}{\text{month}} \right)}{\text{Total Expenditure} \left( \frac{\text{USD}}{\text{month}} \right)} \times 100$$



## HH spending of their income on food:

- 75% : very high food insecure
- 65-75%: high
- 50-65%: medium
- < 50%: low.

$$\text{NALE} = \frac{\text{Energy (kcal/capita/day)}}{\text{Nutritional Recommended Intake of Energy (kcal/capita/day)}} \times 100$$

$$\text{NALP} = \frac{\text{Protein Consumption (kcal/capita/day)}}{\text{Nutritional Recommended Intake of Protein (kcal/capita/day)}} \times 100$$

$$\text{NALF} = \frac{\text{Fat Consumption (kcal/capita/day)}}{\text{Nutritional Recommended Intake of Fat (kcal/capita/day)}} \times 100$$

$$\text{NALC} = \frac{\text{Carbohydrates (kcal/capita/day)}}{\text{Nutritional Recommended Intake of Carbohydrates (kcal/capita/day)}} \times 100$$



Table 1. Nutritional Recommended Intake by Ages

Age (years)	Calories/Energy (kcal/capita/day)	Protein (g/capita/day)	Fat (g/capita/day)	Carbohydrates (g/capita/day)
10-12	1,900	55	65	280
13-15	2,050	65	70	300
16-18	2,100	65	70	300
19-29	2,250	60	65	360
30-39	2,150	60	60	340
50-64	1,800	60	50	280
65-80	1,550	58	45	230
>80	1,400	58	40	200

## Categories for NALE/NALP/NALF/NALC:

- NALE ≥100: Good
- 80 ≤ NALE ≤ 99: Medium
- 70 ≤ NALE < 80: Low
- NALE < 70: Deficit.

## HH food security:

- NALE > 80% and SFE < 60%: high
- NALE > 80% and SFE ≥ 60%: marginal
- NALE ≤ 80% and SFE < 60%: low
- NALE ≤ 80% and SFE ≥ 60%: deficient

## Method for goal no. 2:

### OLS:

$$SFE_i = \alpha_i + demography_i + location_i + occupation_i + technology_i + socialsecurity_i + \varepsilon_i$$

### Logit:

$$\left( \frac{P}{1-P} \right) = \alpha_i + demography_i + location_i + occupation_i + technology_i + socialsecurity_i + \varepsilon_i$$

The level of food security is 1 for households categorized as high food security and 0 for others

- Location: rural-urban; West Java, East Java, Central Java, DI Yogyakarta, and Banten.
  - Occupation: type of employment, employment status.
  - Social security: receives social assistance from the government, which is cash that can be used to buy food or food provisions, such as the Family Hope Program (PKH).
  - Technology: access to internet access, mobile phones and laptops.
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# Result

## Independent Sample T-test Result of Household Expenditure by Gender of The Head Household (Household members: 2)

Category	Mean (USD/month)	Sig. (2-tailed)
<b>Food expenditure:</b>		
- Male	113.19	0.00**
- Female	107.43	
<b>Non-food expenditure:</b>		
- Male	120.33	0.06*
- Female	127.54	
<b>Total expenditure</b>		
- Male	233.52	0.76
- Female	234.97	
<b>Food/total expenditure</b>		
- Male	56.14%	0.00**
- Female	52.81%	

- There are significant differences in the household expenditure on food between female and male households.
- The food expenditure of male household heads was higher than female household heads.

## Main Employment Status of Female as The Head Household

Sectors	Main Employment Status (%)						Share Sector/Total
	Own account worker	Employer assisted by temporary worker/unpaid worker	Employer assisted by permanent worker/paid worker	Regular employee	Casual employee	Family worker/unpaid worker	
Paddy and secondary crop agriculture	15.85	52.87	43.55	12.32	61.43	47.34	<b>26.61</b>
Horticulture	1.95	3.72	4.38	1.55	6.55	8.28	<b>2.82</b>
Plantation and forestry	2.52	1.86	2.30	1.59	2.77	6.51	<b>2.27</b>
Fisheries and livestock	4.83	5.25	2.30	1.19	0.50	7.69	<b>3.30</b>
Manufacturing	8.14	5.66	10.37	22.83	4.37	0.59	<b>11.42</b>
Wholesale, retail, repair, transportation	35.82	17.54	13.59	9.61	2.27	14.79	<b>20.99</b>
Accommodation and food and beverage provision	18.16	10.99	12.21	7.44	1.43	8.28	<b>11.89</b>
Education	0.50	0.08	0.23	10.98	0.34	-	<b>3.31</b>
Other Services	12.21	2.02	11.06	32.48	20.34	6.51	<b>17.38</b>
Total	100.00	100.00	100.00	100.00	100.00	100.00	100.00

- The highest absorption: primary agriculture sector, especially paddy and secondary crop agriculture; status: casual employees.
- The second sector: Wholesale and retail; status: own account worker with most small and medium scale enterprises.
- Thus, their income tends to be unstable, while their basic needs, especially for food, must be fulfilled.

# Socioeconomic Characteristics and Household Expenditure per Capita per month

Characteristics	Number Household (%)	Food Expenditure (\$/month)	Non-Food Expenditure (\$/month)	Total Expenditure (\$/month)	Share of Food expenditure/total expenditure (%)
<b>Age (years)</b>					
- 51-65	41.78	109.49	124.12	233.61	52.88
<b>Education</b>					
- elementary school	58.52	91.15	81.60	172.75	55.91
<b>Number of family members (persons)</b>					
- 1-2	65.93	80.30	101.94	182.24	51.96
<b>Marital status</b>					
- Widow	69.91	101.44	113.47	214.91	53.71
<b>Field of main occupation</b>					
- Paddy and secondary crop agriculture	26.61	81.08	59.61	140.69	59.17
<b>Main Employment Status</b>					
- Own account worker	42.01	103.50	115.45	218.94	52.67
<b>Location</b>					
- Urban	60.72	117.91	154.18	272.09	50.01
<b>Provinces</b>					
- East Java	35.30	98.6	107.24	205.84	54.84
<b>Technology</b>					
<b>Internet Access</b>					
- No	63.09	85.90	75.25	161.14	56.70
<b>Mobile phone Access</b>					
- No	52.82	85.43	71.47	156.90	57.61
<b>Computer Access</b>					
- No	94.59	101.56	108.82	210.38	53.86
<b>Social security</b>					
- No	65.59	114.74	149.39	210.38	50.38



# Household Consumption

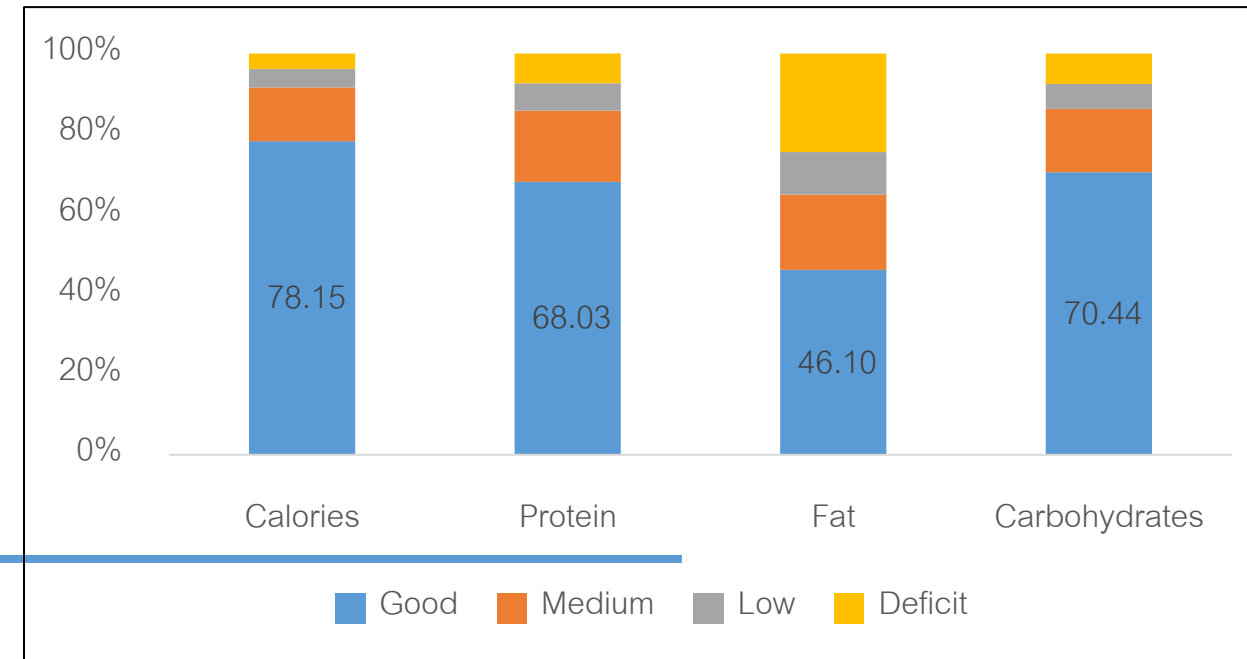
## Average Consumption of Energy, Calories, Protein, and Carbohydrates of Household

Categories	Calories	Protein	Fat	Carbohydrates
Consumption (kcal/capita/day)	2,484.65	75.08	53.51	354.02
Nutritional Recommended Intake (kcal/capita/day)	1,805.84	59.36	50.93	59.36
Nutritional Adequacy Level (%)	<b>140.66</b>	<b>126.56</b>	<b>106.54</b>	<b>126.56</b>

- On average, the number of households headed by women falls into the good nutritional adequacy level category.
- However, there are still households with a medium to deficit status of nutritional adequacy especially for fat consumption (53.90%).

- The nutritional adequacy level for energy, protein, fat, and carbohydrates per capita is good (>100%).
- However, the average fat adequacy is lower than the others at only 106.54%, mainly sourced from beef and cooking oil → imported.

## Number of Households by Nutritional Adequacy Level



# Household Food Security

Number of Households by Food Security Categorize (N=15,619)

Energy Consumption Rate (NALE)			Food Expenditure (SFE)	
			Low (< 60% Total Expenses)	Tall (≥60% Total Expenses)
Sufficient consumption)	(>80%	Energy	<u>High food security</u>	<u>Marginal food security</u>
			9,344 (59.82%)	4,971 (31.83%)
Insufficient consumption)	(≤80%	Energy	<u>Low food security</u>	<u>Very Low food security</u>
			1,003 (6.42%)	301 (1.93%)

- Of the 15,619 respondents, 40.18% of households fall into the vulnerable food security category.
- HH spend more than 60% of their income on food because the price of food is expensive.
- For comparison, the average price of rice in Indonesia is USD1/kg, while in India and Thailand, it is USD0.34/kg and USD0.27/kg, respectively.
- The price of rice remains the most significant contributor to inflation in Indonesia.
- To achieve a sustainable food system through food security in Indonesia, it must pay attention to affordable and stable food commodity prices.

# Determinants of HH Food Expenditure and HH Food Security

Variables	OLS (Coefficient)	Logit (Odds Ratio)
	Share of Food Expenditure	Food Security/Insecurity
<b>Number of family members</b>		
Base: 1-2		
3-4	3.776***	-.904***
5-7	7.133***	-1.625***
8-10	9.48***	-2.525***
<b>Marital status</b>		
Base: Single		
Married	.749	-.083
Divorce	1.036	-.063
Widow	-.369	.09
<b>Age (years)</b>		
Base: >=20		
21-35	.781	.953**
36-50	-2.644	1.443***
51-65	-3.762	1.865***
66-80	-4.058	1.794***
>=81	-2.573	1.551***
<b>Education</b>		
Base: Elementary School		
Junior high school	-1.322***	.281***
Senior high school	-3.418***	.343***
University	-8.084***	.787***
<b>Location</b>		
Base: Rural		
Urban	-2.435***	.254***
<b>Provinces</b>		
Base: West Java		
Central Java	-1.035***	.023
DI Yogyakarta	-3.382***	.14
East Java	.337	-.218***
Banten	-.156	.165

- Factors that significantly affect the share of food expenditure and household food security are:
  - a. number of household members
  - b. level of education
  - c. location of residence
  - d. type of employment
  - e. level of access to technology
  - f. availability of social security for food.
  
- The average share of food expenditure of households with 3-4 members is 3.776% higher than households with 1-2.
  
- As the number of household members increases, the household's probability of being categorized as food secure decreases. For example, for households with 3-4 members, the probability of being in the food secure category is 0.904 times lower than households with 1-2 members.

Variables	OLS (Coefficient) Share of Food Expenditure	Logit (Odds Ratio) Food Security/Insecurity
<b>Field of main occupation</b>		
Base: Paddy and secondary crop agriculture		
Horticulture	-1.747**	.184
Plantation and forestry	-.313	.025
Fisheries and livestock	-.909	.177
Manufacturing	-1.904***	.342***
Wholesale&retail, repair&maintenance	-3.621***	.476***
Accommodation and food and beverage provision	-3.255***	.393***
Education	-.692	.219
Other services	-1.745***	.137*
<b>Main Employment Status</b>		
Base: Own account worker		
Employer assisted by temporary worker/unpaid	.254	.119
Employer assisted by permanent worker/paid worker	-3.422***	.15
Regular employee	2.406***	-.285***
Casual employee	2.958***	-.377***
Family worker/unpaid worker	.579	-.087
<b>Internet Access</b>		
Base: No		
Yes	-3.61***	.318***
<b>Mobile phone Access</b>		
Base: No		
Yes	-2.966***	.428***
<b>Computer Access</b>		
Base: No		
Yes	-5.522***	.676***
<b>Social Security for Food</b>		
Base: No		
Yes	2.76***	-.279***
_cons	62.044***	-1.623***
Observations	8916	8916

- The expenditure share is higher when the head of the household works in the secondary and tertiary sectors compared to the primary sector.
- Families with high incomes tend to spend a lower proportion of their incomes on food, which is consistent with Engel's law.
- Providing PKH significantly affects the share of food security and food security levels, where the probability of those who receive PKH decreases by 0.279% and falls into the food secure category.
- With the provision of PKH, they have the cash to buy food so that their food insecurity is reduced.

# Conclusion

- 1) The average food expenditure for households headed by women has reached an excellent nutritional adequacy level, except for fat consumption.
    - a. The highest consumption is food that contains carbohydrates, especially rice.
    - b. There are still 40.18% in the vulnerable food security category.
  - 2) Factors that significantly influence the share of food expenditure and HH food security headed by women are the number of household members, level of education, location of residence, type of work, level of access to technology, and availability of social security for food.
  - 3) The results of this research have serious policy consequences:
    - a. Women's access to technology must be increased. Likewise, their level of education must be achieved. Even though they can not get formal studies, they can still get training or other informal studies.
    - b. The government should implement policies to address the difficulty of accessing food commodities when prices rise.
    - c. The government can create a market operation policy for the lower middle class or specifically for female-headed households. In addition, assistance should be in something other than cash but directly provide commodities to food-insecure communities that have experienced price increases. What must be prioritized by the government is valid household data so that the assistance provided is genuinely targeted.
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# THANK YOU

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