Gender **Disparities** on **Food Consumption Patterns** among Coastal Community with **Climate Change Experience (CCE)** in Sabak Bernam Selangor

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Climate change as a global challenge

- **Loss of agro-diversity** due to climate change (Shawon et al., 2018) may **threats fisheries industry** (Yin et al., 2025)

- Married rural women are the indicator of not having power (Zainalaludin et al., 2025; Zainalaludin et al., 2022). Thus, a female-headed household may suffer poverty

- Poor female household heads are economically vulnerable (Zainalaludin et al., 2022; Kusakabe & Thongprasert, 2022; Saidi et al., 2021)

- Besides, fisheries activities involve **masculine activities** (Zainalaludin et al., 2023; Saidi et al., 2021).

- Moreover, the vulnerable groups will be poor and marginalized in coastal communities (Dinh et al., 2025), especially **disabled men and poor single mothers** (Saidi et al., 2021)

- **Poor households** may often consume nutrient-poor foods. (Jaafar et al, 2024a; Mirzabaev et al., 2023)

- **Women** prefer **healthier food**, but **income limits actual consumption** for both genders (Jaafar et al., 2020; 2024b)

Research Objectives

- Explore **gender-related** differences in food consumption

(8 food groups) ⟶

- Examine effects of:

  1. **Gender of respondent**

  2. **Gender of household head**

  3. **Gender composition of household**

- Identify **predictors of poor female-headed households**

Carbohydrates:
Cereals, grains, roots, and tubers forming the dietary foundation

Dairy Products
Milk and dairy-based foods contributing to calcium intake

Vegetables & Leaves
Fresh produce providing vitamins and minerals

Oils & Fats
Cooking oils, fats, and butter for food preparation

Legumes & Nuts
Pulses, nuts, and seeds providing plant-based protein sources

Protein Sources
Meat, fish, and eggs essential for complete nutrition

Fruits
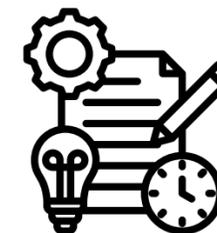Fresh and seasonal fruits for vitamin C and fiber

Sugar & Sweets
Sweeteners and confectionery items in the diet

Methodology

Location

Sabak Bernam, a coastal district in Selangor state located at Malacca Strait of Peninsular Malaysia.

Sampling

- **274** households [n = 226 with (39.2%) with climate change experience (CCE)]
- **Equal Distribution** between male and female

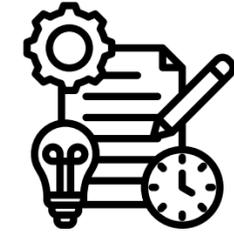| District	Sabak	Pasir Panjang	Sungai Panjang	Bagan Nakhoda Omar	Panchang Bedena	Total
Gender	Male / Female	Male / Female	Male / Female	Male / Female	Male / Female	
Sabak Bernam	30 / 30	30 / 30	30 / 30	30 / 30	30 / 30	150/ 150

Analysis

Independent **t-test** & **ANOVA** (FCS), **Binary Logistic Regression**

Respondent

The respondents who participate in the **SURVEY** do not necessarily have to be directly involved in the **aquaculture or fisheries activities**, but they are **coastal communities** who are assumed to be **vulnerable to the impacts of climate change** in this study. They can be **vulnerable or able-bodied individuals** (i.e., victims of climate change in the SL).

Four (4) vulnerable groups are focused on in this study:

a) **older adults (>59 years old)**

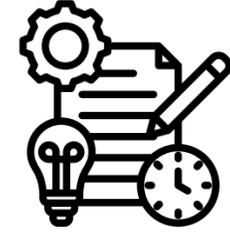b) **handicapped** except mentally retarded, dead, blind, and mute

c) **youth (18-30 year old)**

d) **working in a day-pay job**

Malaysia PLI =

RM2589 (USD613.58) was used to classify the **poor category of household income**.

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Instrument

A: Personal & Household Profile

B: Household Income Profile

C: Living Arrangement

D: Household Expenses

E: Food Consumption Profile

F: KAP

G: Climate Change Adaptation Strategies

H: WEFI & Gender Awareness

I: WHO -5 (Overall wellbeing)

Food Consumption Score (FCS) Questionnaire

	Foods	Number of days eaten in the past 7 day
1	**Cereals, grains, roots and tubers, such as:** Rice, pasta, bread, sorghum, millet, maize, potato, yam, cassava, white sweet potato, plantain	|__|
2	**Pulses/legumes, nuts and seeds, such as:** beans, cowpeas, lentils, soy, pigeon pea, peanuts, or other nuts	|__|
3	**Milk and other dairy products, such as:** milk, yoghurt, cheese, and other dairy products [Exclude margarine/butter or small amounts of milk for tea/coffee]	|__|
4	**Meat, fish and eggs, such as:** goat, beef, chicken, pork, fish, including canned tuna, insects, escargot, and/or other seafood, eggs (meat and fish consumed in large quantities and not as a condiment)	|__|
5	**Vegetables and leaves, such as:** spinach, onion, tomatoes, carrots, peppers, green beans, lettuce, etc	|__|
6	**Fruits, such as:** bananas, apples, lemon, mango, papaya, apricot, peach, etc	|__|
7	**Oil/fat/butter, such as:** vegetable oil, palm oil, shea butter, margarine, and other fats/oil	|__|
8	**Sugar, or sweet, such as:** sugar, honey, jam, candy, cookies, pastries, cakes and other sweet (sugary drinks)	|__|
9	**Condiments / Spices, such as:** tea, coffee, cocoa powder, salt, garlic, spices, yeast/baking powder, tomato paste or sauce, and small amounts of meat, fish, milk or other food items consumed as a condiment	|__|

Adapted from: Food Consumption Score (FCS) World Health Organization (WHO) 2024

Methodology
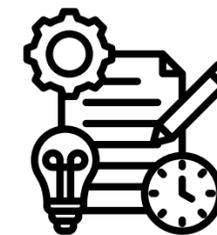
Data Collection

FGD session with keywomen participants, Sabak, Sabak Bernam (17 January 2025)

FGD session with male day-pay workers, Sabak, Sabak Bernam (17 January 2025)

FGD Facilitator and Enumerator in Sabak Sub-distict of Sabak Bernam (17 January 2025)

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RO2(a): Gender Differences on Food Consumption

Food Category	Findings
Vegetables and leaves	Significantly **higher among females (FCS = 6.17) than males (FCS = 5.25)**
Oils, fats, and butter	Significantly **higher among females (FCS = 3.08) than males (FCS = 2.68)**
Fruits	Significantly **lower among males (FCS = 3.27) than females (FCS = 4.10)**
Cereals, grains, roots, and tubers Meat, Fish & Eggs Legumes/pulses, nuts, and seeds Dairy Sugar and sweets	**No significant difference**

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Table 1: Food Consumption Score among Male and Female (*n*=226)

Food Groups	Sex	*n*	Mean	SD	*t*	*p*<0.05
Cereals, grains, roots, and tubers	Male	128	12.9531	3.06327	-0.731	0.465
	Female	98	13.2449	2.85043	-0.738	0.461
Legumes/pulses, nuts, and seeds	Male	128	3.0938	4.71626	-0.987	0.325
	Female	98	3.7959	5.97755	-0.957	0.34
Dairy	Male	128	9.6875	11.07295	-1.601	0.111
	Female	98	12.1633	12.0879	-1.582	0.115
Meat, fish, and eggs	Male	128	23.7813	7.53463	-1.558	0.121
	Female	98	25.3061	6.9585	-1.575	0.117
Vegetables and leaves	Male	128	5.25	2.36443	-3.154	**0.002***
	Female	98	6.1735	1.91589	-3.242	**0.001***
Fruits	Male	128	3.2734	2.60742	-2.467	**0.014***
	Female	98	4.102	2.35722	-2.5	**0.013***
Oils, fats, and butter	Male	128	2.6797	1.28703	-2.54	**0.012***
	Female	98	3.0765	0.98009	-2.631	**0.009***
Sugar and sweets	Male	128	2.625	1.23594	-1.403	0.162
	Female	98	2.8469	1.09922	-1.425	0.156

***p*<0.05

Household-Headship Differences on Food Consumption

Food Category	Findings
Legumes/pulses, nuts, and seeds	Significantly **lower in female-headed** households (FCS = 0.98) compared to male-headed households (FCS = 3.78)
• Cereals, grains, roots, and tubers • Meat, Fish & Eggs • Vegetables and leaves • Fruits • Dairy • Oils, fats, and butter • Sugar and sweets	No significant difference

Male-headed households had **higher legume/nut intake**, while **female-headed households** relied **more on staple proteins** like fish due to resource constraints.

Dietary patterns appear similar across household headship, likely shaped by **affordability, availability, and cultural norms**.

Table 2: The Differences between Heads of Household with Food Consumption Score among Respondents (n=226)

Food Groups	Head of Household	n	Mean	SD	t	p<0.05
Cereals, grains, roots, and tubers	Male Headed	195	13.0974	2.92267	0.225	0.822
	Female Headed	31	12.9677	3.30135	0.206	0.838
Legumes/pulses, nuts, and seeds	Male Headed	195	3.7846	5.55709	2.79	**0.006**
	Female Headed	31	0.9677	1.95762	5.305	**0**
Dairy	Male Headed	195	11.1179	11.68493	1.165	0.245
	Female Headed	31	8.5161	10.67043	1.244	0.22
Meat, fish, and eggs	Male Headed	195	24.2872	7.3161	-0.8	0.425
	Female Headed	31	25.4194	7.34291	-0.798	0.43
Vegetables and leaves	Male Headed	195	5.6667	2.21212	0.274	0.784
	Female Headed	31	5.5484	2.33579	0.264	0.793
Fruits	Male Headed	195	3.6359	2.53953	0.047	0.963
	Female Headed	31	3.6129	2.51234	0.047	0.963
Oils, fats, and butter	Male Headed	195	2.8436	1.17749	-0.261	0.794
	Female Headed	31	2.9032	1.20013	-0.258	0.798
Sugar and sweets	Male Headed	195	2.7538	1.15251	1.041	0.299
	Female Headed	31	2.5161	1.35083	0.928	0.36

*p<0.05

Predictors of poor female-headed households

Predictor	B	p-value	Exp(B)	Interpretation
Legumes & Seeds Consumption (CE2)	-0.341	0.03	0.711	Each **one unit increase in consumption score reduces the likelihood of being poor female-headed household** by 29% (1 - 0.583 = 0.417)
Number of Male Household Members	-0.539	0.022	0.583	Each **additional male household member reduces the likelihood of being a poor female-headed household** by 41.7% (1 - 0.583 = 0.417)

Households that consume **more legumes and seeds** are **less likely to be poor**, as these foods may reflect better nutrition or economic status.

The presence of **more male** household members may support income generation, thereby **reducing the risk of poverty**.

Result

Table 3: Logistic Regression (n=226)

	B	S.E.	Wald	df	Sig.	Exp(B)
Cereals, grains, roots, and tubers	0.018	0.079	0.05	1	0.822	1.018
Legumes/pulses, nuts, and seeds	-0.341	0.157	4.72	1	**0.03**	**0.711**
Dairy	-0.011	0.023	0.239	1	0.625	0.989
Meat, fish, and eggs	0.027	0.045	0.367	1	0.545	1.027
Vegetables and leaves	-0.101	0.113	0.802	1	0.371	0.904
Fruits	0.021	0.099	0.046	1	0.83	1.021
Oils, fats, and butter	0.019	0.257	0.006	1	0.94	1.019
Sugar and sweets	-0.047	0.24	0.038	1	0.845	0.954
Total household member male	-0.539	0.236	5.212	1	**0.022**	**0.583**
Total household member female	0.127	0.187	0.463	1	0.496	1.136
Constant	-0.896	1.294	0.48	1	0.488	0.408

*p<0.05

DV= Poor Female-headed household =1; others =0

Omnibus Tests of Model Coefficients

		Chi-square	df	Sig.
Step 1	Step	21.371	10	0.019
	Block	21.371	10	0.019
	Model	21.371	10	0.019

Omnibus: p<0.05 (p=0.019)

Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	118.407a	0.09	0.196

a. Estimation terminated at iteration number 7 because parameter estimates changed by less than .001.

Variance = 19.6%

Conclusion

Gender Differences in Food Consumption

- **Women** consume **more vegetables and oils** compared to men.
- **Men** consume **fewer fruits** compared to women.
- **Female-headed households** consume significantly **fewer legumes, nuts, and seeds.**
- **No significant gender-related** differences **found** for 1) Cereals, grains, roots, and tubers, 2) Meat, Fish & Eggs, 3) Legumes/pulses, nuts, and seeds 4) Dairy AND 5) Sugar and sweets

Predictors of Poverty in Female-Headed Households

- **Higher legume** consumption **reduces** the **likelihood of being poor**, reflecting better nutrition and economic status.
- **More male household members** indicating their role in income generation and food security.

Policy Implications

- **Gender-responsive nutrition and social protection policies** are needed in climate-affected coastal communities.
- **Targeted interventions for female-headed households** are crucial to reduce poverty and improve food security.

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Thank you for listening!

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