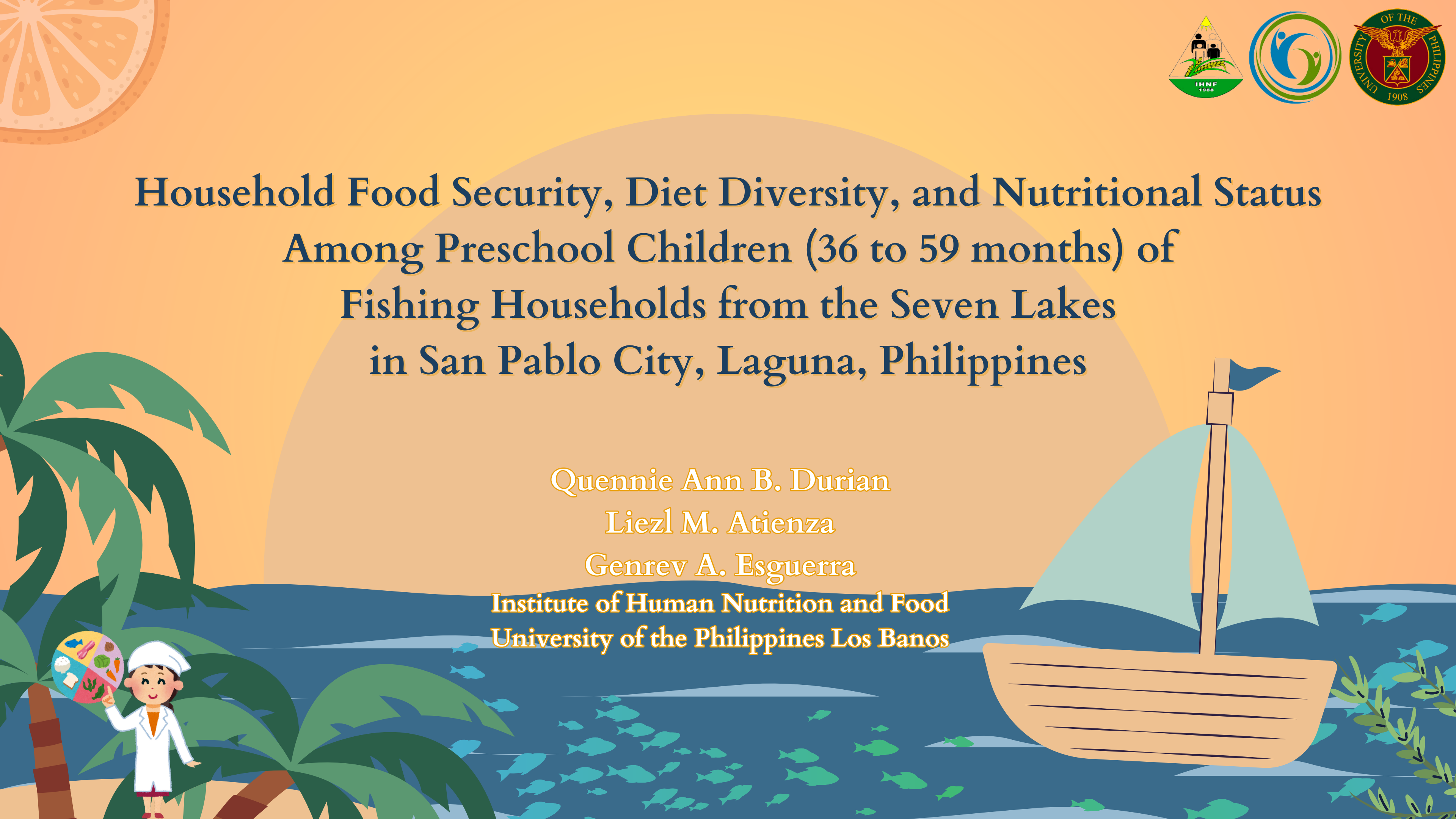# Household Food Security, Diet Diversity, and Nutritional Status Among Preschool Children (36 to 59 months) of Fishing Households from the Seven Lakes in San Pablo City, Laguna, Philippines

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Introduction

Introduction

Food security exists "when all people, at all times, have physical and economic access to sufficient, safe, and nutritious food that meets their dietary needs and food preferences for an active and healthy life."
(World Food Summit, 1996).

According to Hoddinott and Yohannes (2002), diet quality and diversity are strongly correlated with household food insecurity.

Introduction

Global and PH Status of Food Security

2.4 B
people in the world experienced moderate to severe food insecurity in 2022

691 to 783 M
people in the world experienced hunger in 2022

5.3 M
Filipinos were severely food insecure

48 M
Filipinos faced moderate to severe food insecurity

1 in 10

Filipino households
were food insecure,

affecting those from the poorest regions and
those who rely on agricultural livelihoods
(World Food Programme, 2022).

People who experience food insecurity are at higher risk for various forms of malnutrition, such as stunting and growth retardation among children and micronutrient deficiencies and obesity among adults (FAO, 2021).

Introduction

Malnutrition in the Philippines

Top 5 highest prevalence of stunting in East Asia and the Pacific Region

Top 10 highest prevalence of stunting in the world

95 children die of malnutrition everyday

Limited or constrained income can force households to make difficult decisions, potentially resulting in an inadequate food supply (Wight et al., 2014).

Introduction

2 million fishermen in the Philippines

80% small-scale fishermen (SSF)

$240 (Php 12,030)
poverty threshold in the Philippines (PSA, 2022)

$ 167 (Php 8,379)
minimum amount needed to support the basic food needs

$177 (Php 8,916.67)
average monthly income of fishermen in the PH (FAO, 2021)

Significance of the Study

Despite being a global concern, there are very limited studies regarding food insecurity at the local level, specifically those from the agricultural sector like the fishermen. For example, San Pablo City is known for its seven lakes which serve as fishing grounds for many of its residents. However, there are currently no studies available that investigate their nutrition situation. This study seeks to provide valuable insights that can inform targeted interventions, policy development, and programs aimed at improving the nutrition, health, and well-being of individuals from fishing communities.

Research Objectives

This study aims to assess the food security status of the fisherfolk households from the seven lakes in San Pablo City, Laguna, Philippines.

Describe the socioeconomic and demographic characteristics of the fishing household using a structured socio-demographic profile questionnaire;

Evaluate the dietary diversity of the household using Food Consumption Score (FCS);

Determine the prevalence of the different levels of household food insecurity using the Household Food Insecurity and Access Scale (HFIAS);

Assess the nutritional status of the preschool children aged 36 to 59 months in the family of the respondents; and

Analyze the relationship between the food security status and the nutritional status of the preschool children from the family of the fishing households in San Pablo City, Laguna.
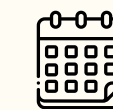
Materials and Methods

MATERIALS AND METHODS

1 RESEARCH DESIGN

A **quantitative, cross-sectional study design** was used to determine the association of household food insecurity status to the nutritional status of preschool children aged 36 to 59 months old from fishing households in San Pablo City, Laguna, Philippines.

2 LOCALE AND POPULATION OF THE STUDY

📅 March to July 2023

📍 San Pablo City, Laguna

👤 86 participants

3 SAMPLING DESIGN

Inclusion criteria

- Fishing as primary source of livelihood
- A household head that oversees the food management and preparation in the house
- A child aged 36 to 59 months old in the household.

MATERIALS AND METHODS

4 DATA COLLECTION

- Endorsement Letter
- Informed Consent Form
- Oplan Timbang Plus Data
- Tri-part interview questionnaire
  - Socio-demographic profile
  - Household Food Insecurity Access Scale (HFIAS)
  - Food Consumption Score (FCS)

5 DATA ANALYSIS

HFIAS
- HFIA-related Conditions
- HFIAS Score
- HFIA Prevalence

FCS
- FCS Group

Nutritional Status
- height-for-age
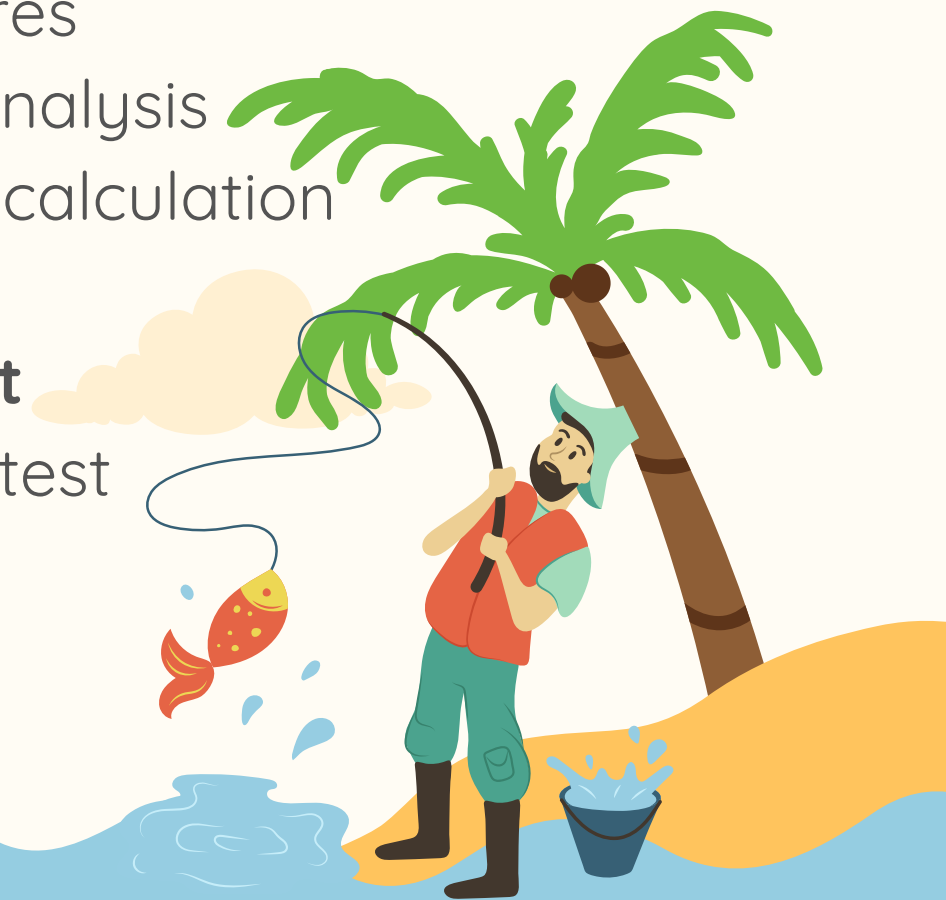- weight-for-age
- weight-for-height

6 STATISTICAL ANALYSIS

Descriptive Statistical Analysis
- mean
- median scores
- frequency analysis
- percentage calculation

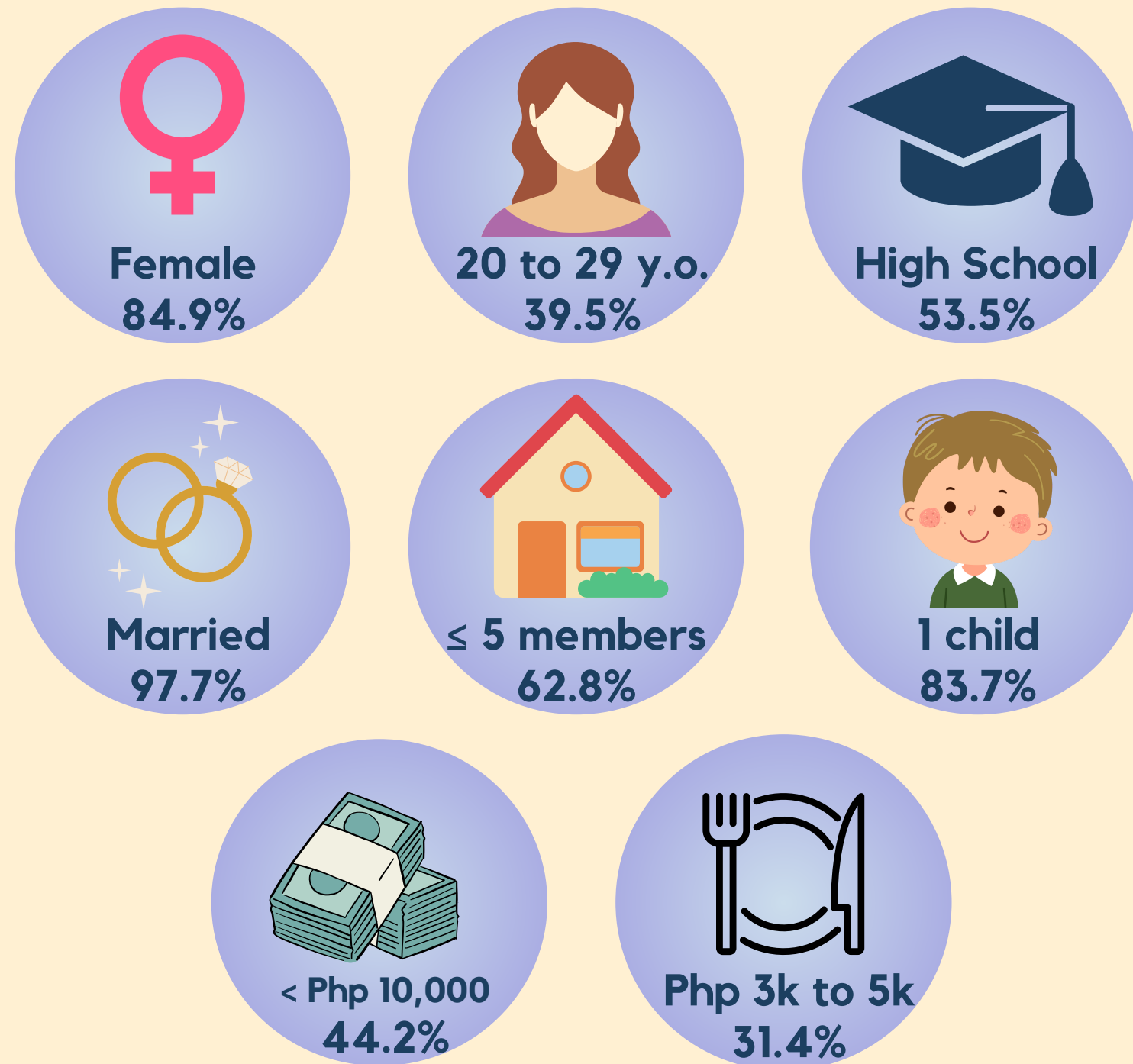**Correlation test**
- Kendall tau test

Results and Discussion

Results & Discussion

Socio-demographic Profile of the Household

Female
84.9%

20 to 29 y.o.
39.5%

High School
53.5%

Married
97.7%

≤ 5 members
62.8%

1 child
83.7%

< Php 10,000
44.2%

Php 3k to 5k
31.4%

Highlight 1

Most of the household heads reached secondary education only and have a low average monthly income which may influence their food security status.
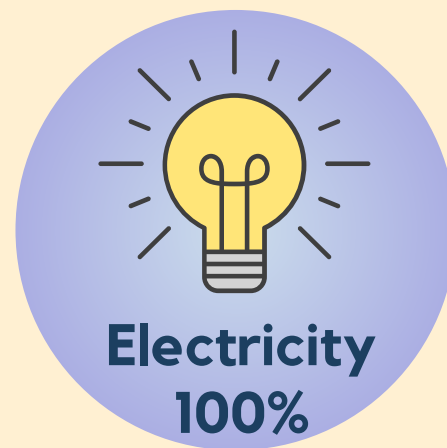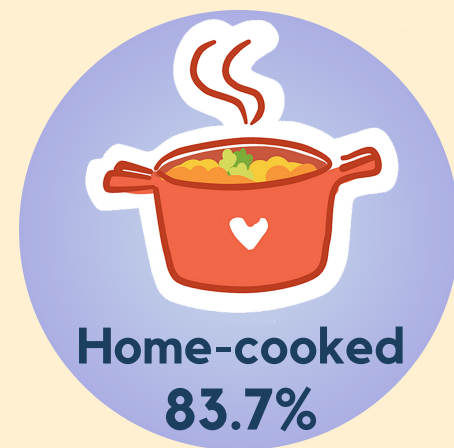
Highlight 2

Majority of the households earn less than $200 which is below the current poverty threshold, $240 (PSA, 2022)

Highlight 3

About three-fourths of the households spend less than $140 on food per month. This is below $167 which was the minimum amount needed to sustain the basic food needs of a family of five (PSA, 2022).

Results & Discussion

Socio-demographic Profile of the Household

Home-cooked 83.7%

Tap water 74.4%

Electricity 100%

> 10 yrs 62.8%

3 to 5 hrs 50%

Own tools 95.3%

No trainings 52.3%

Highlight 1

Majority of the fishermen have been in the fishing industry for more than ten years now

Highlight 2

More than half of the households have not yet attended any fishing-related training and seminars. However, according to Mahmud et al. (2012), the income of fishermen increases significantly as they acquire more training.

Highlight 3

According to the SmartFish Programme Report by the Indian Ocean Commission in 2011, the poor attendance was due to lack of snacks and allowances during training sessions and fishermen would rather go to work than give their time to such activities.

Results & Discussion
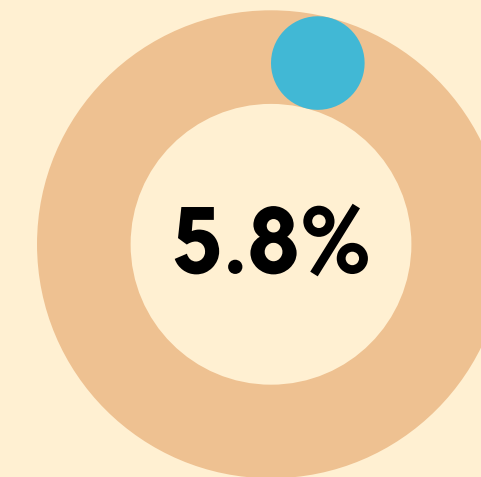
Food security status of the fishing households

1. 1 in every seventeen (17) households were food secure
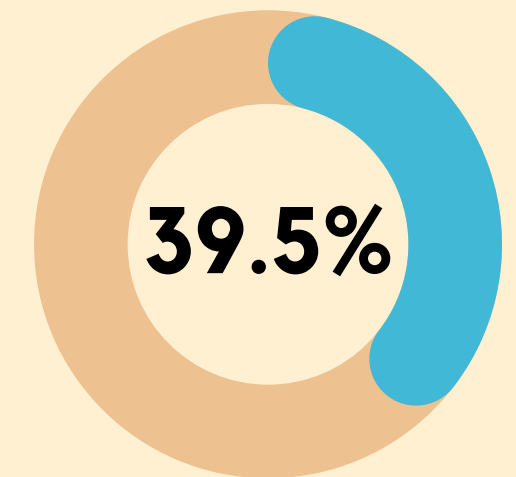
2. Majority of the households were classified as moderately food insecure (45.3%) followed by mildly food insecure with a prevalence of 39.5%.
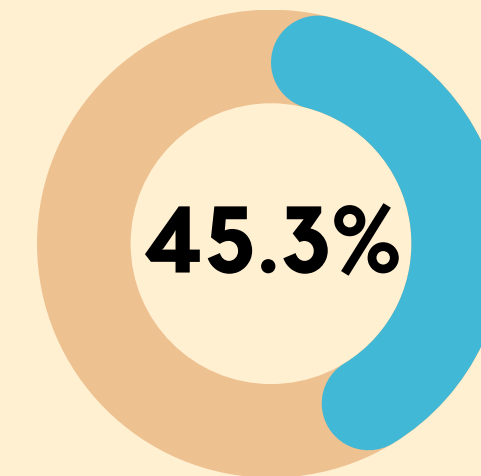
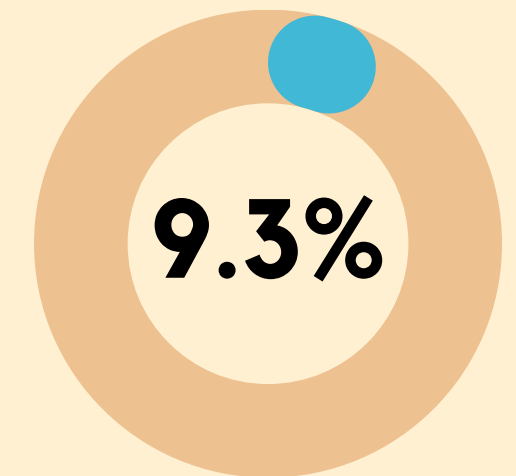**3.** a tenth of the target population was found to be severely food insecure.

5.8%
Food Secure

39.5%
Mildly Food insecure

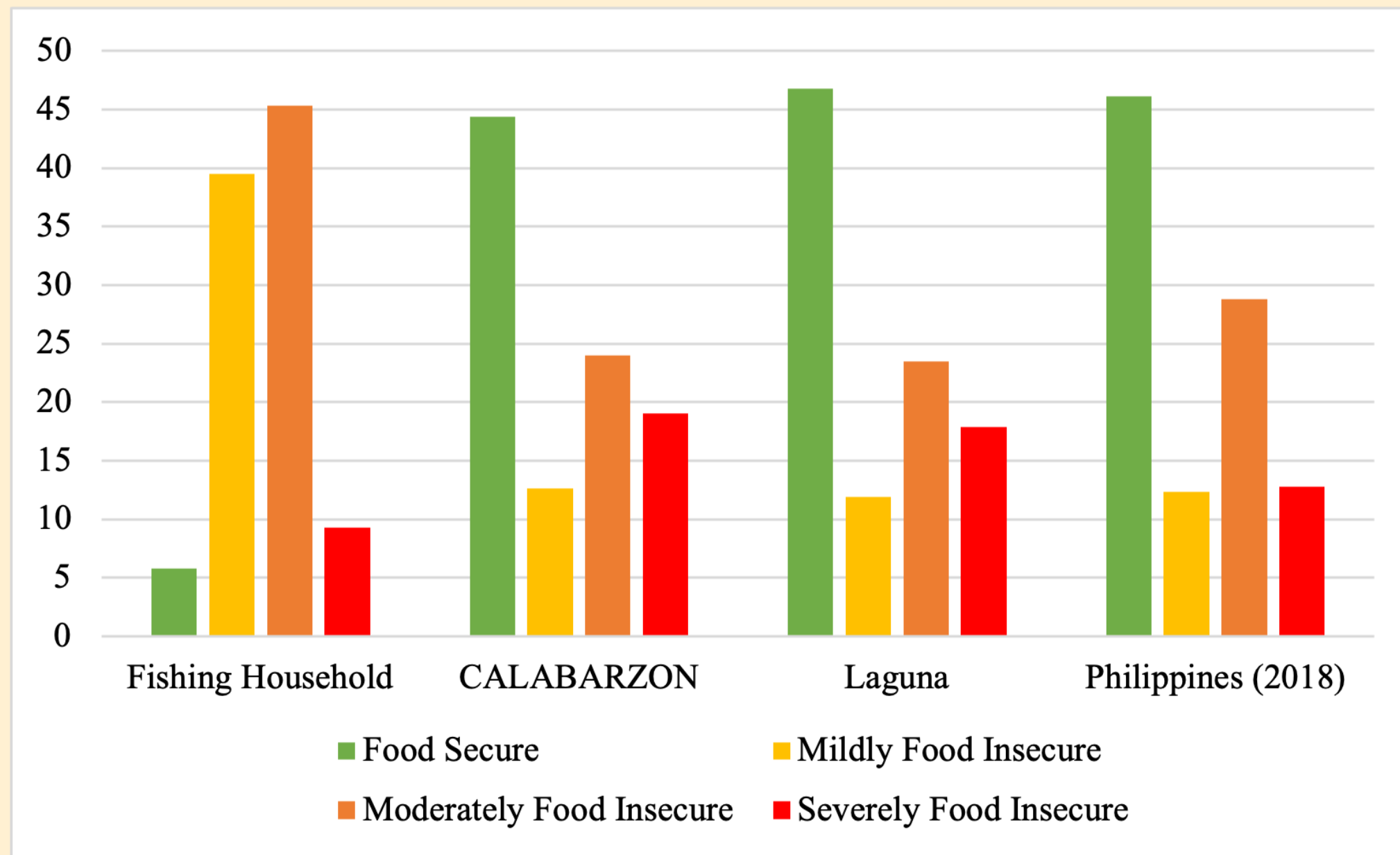**45.3%**
Moderately Food insecure

9.3%
Severely Food insecure

Results & Discussion

## Food security status of the fishing households

According to the Food Security Survey by DOST-FNRI in 2015, CALABARZON had the highest percent distribution of food secure households, whereas Laguna is the province in the region with the highest distribution of food secure households (DOST-FNRI, 2016b)

Results & Discussion

## Dietary diversity and food consumption score of the households

70.9% Acceptable Food Consumption

24.4% Borderline Food Consumption

4.7% Poor Food Consumption
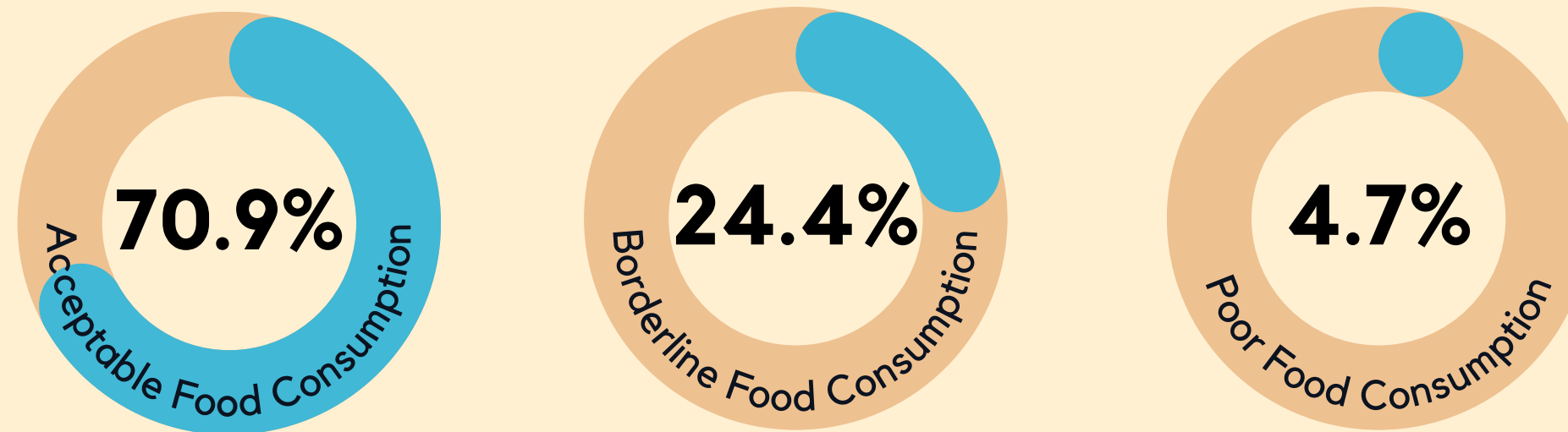
Majority of the households have an acceptable food consumption despite being food insecure.

This is consistent with the findings of DOST-FNRI that diet diversity between the rich and poor was comparable from each other (DOST-FNRI, 2016b).

One possible reason is the inclusion of processed foods into the different food groups. For example, in the guidelines for measuring household and individual dietary diversity by FAO, instant noodles are classified under cereals while processed meats like sausages and hotdogs are grouped under flesh meats (FAO, 2013)

Results & Discussion

## Dietary diversity and food consumption score of the households
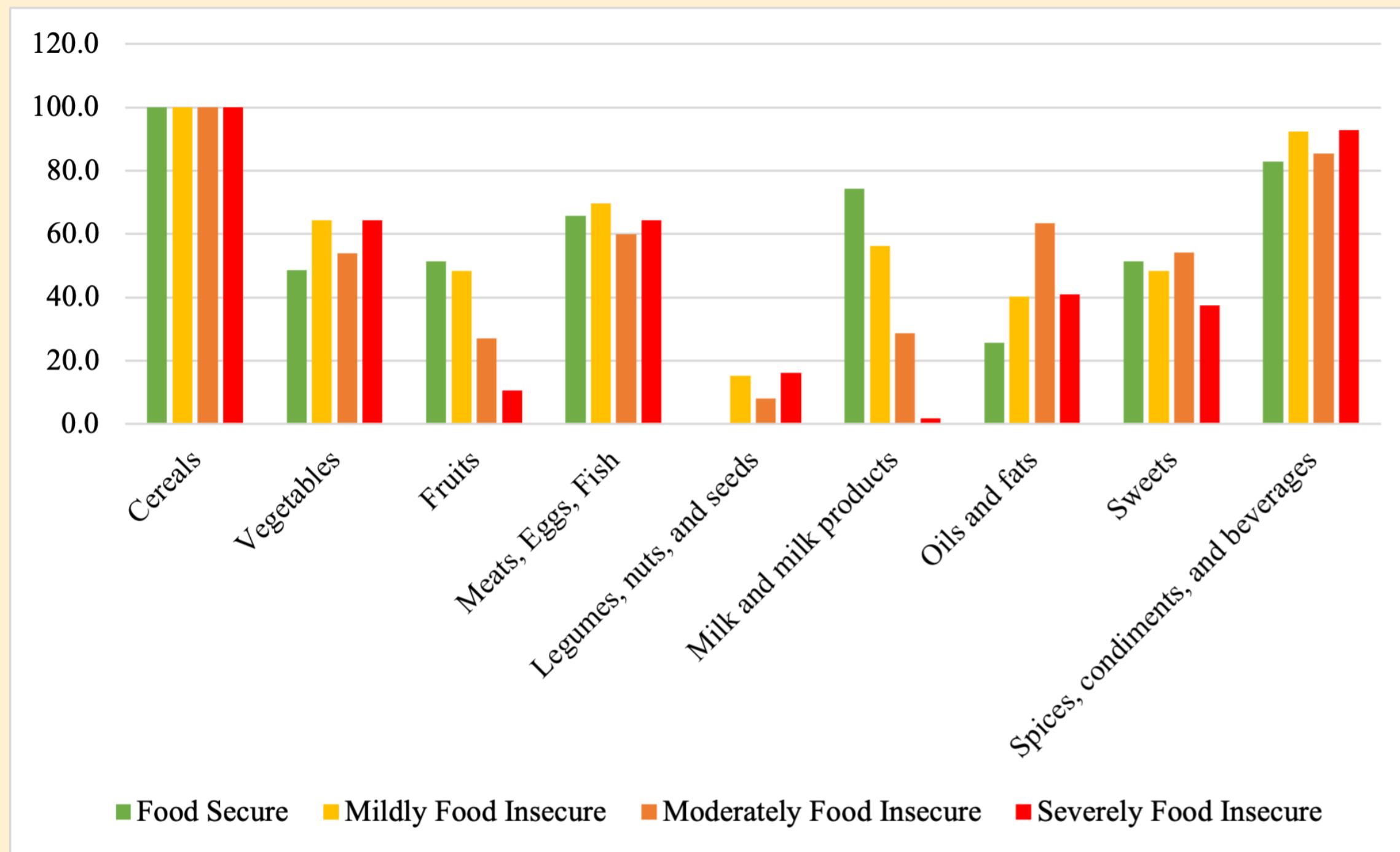
Moderately and severely food insecure households have a significantly low intake of fruits and milk products.

This finding is parallel to the study of Angeles-Agdeppa (2021) which revealed that the diet of food insecure Filipinos were lacking in nutrients such as vitamin A, riboflavin, niacin, calcium, and thiamin which are usually sourced from fruits and milk.
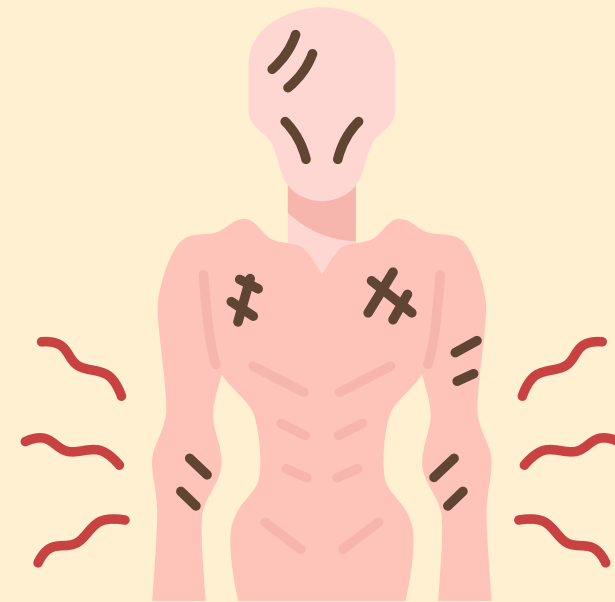
Results & Discussion

Nutritional status of preschool children from fishing households
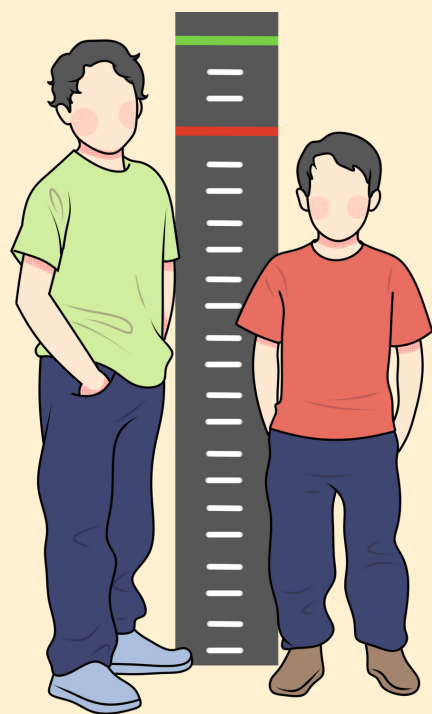
Stunted
45.3%

Underweight
36.1%

Wasted
19.8%

Stunting was the most common form of malnutrition among the surveyed children, affecting **45.3%** of the total population.

This finding is aligned with DOST-FNRI's report that stunting is the most common form of malnutrition among children in the country. Furthermore, children from fishing households exhibited the highest prevalence of stunting, wasting, and underweight among all the occupational groups (Capanzana et al., 2018).

Results & Discussion

Correlation of food insecurity to dietary diversity and HH income

	Food Security Status (HFIAS)	
	p-value	*tau*
Dietary Diversity	0.0040*	0.2902
Household Income	0.0141*	0.2332

Kendall's rank correlation tau test; significant at α=0.05; *significant.

- A positive moderate correlation between FS and DD implies that the household have acceptable food consumption when they are food secure.

- A positive moderate correlation between FS and HH income implies that the higher the household income, the more food secure they are.

Results & Discussion

Correlation of food insecurity and HDD to Nutritional Status

Nutritional Status Indicator		Food Security Status	Food Consumption Score
Height-for-age	*p-value*	$2.11e^{-05}$*	0.0474*
	tau	0.4152	0.2004
Weight-for-age	*p-value*	0.0027*	0.1318
	tau	0.2969	0.1542
Weight-for-height	*p-value*	0.2564	0.0653
	tau	0.1116	-0.0468

Kendall's rank correlation tau test; significant at α=0.05; *significant.

- A positive strong correlation between FS and height-for-age status implies that the child has normal height when the household is food secure.

- A positive moderate correlation between FS and weight-for-age status implies that the child has normal weight when the household is food secure.

- A positive moderate correlation between FCS and height-for-age status implies that the child has normal height when the household has acceptable food consumption.

Results & Discussion

Possible reasons for the lack of correlation between dietary diversity and weight-for-age

1. According to Hoddinott and Yohannes (2002), a greater dietary diversity is associated with a higher caloric availability. However, there was no mention that dietary diversity is equivalent to a better diet quality.

2. Angeles-Agdeppa et al. (2021) revealed that Filipino households experiencing moderate to severe food insecurity have the tendency to consume more calorie-dense foods but significantly low intake of vitamin A, riboflavin, niacin, and total fat as compared to food secure households.

3. Vozoris and Tarasuk (2003) revealed that households experiencing food insecurity tend to have lower dietary quality, even if they have access to a diverse range of foods.
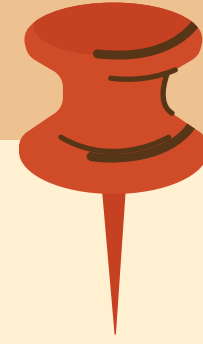
4. Households with limited financial resources might opt for cheaper, energy-dense but nutrient-poor foods, leading to inadequate nutrition despite food diversity. A study by Darmon and Drewnowski (2015) supports this, highlighting the impact of socioeconomic constraints on food choices and nutritional outcomes.

Summary and Conclusion

The fishing households in San Pablo City, Laguna, serve as a microcosm of the greater national setting, highlighting the challenges encountered by fisherfolk communities in terms of food insecurity, diet diversity, and malnutrition. This emphasizes the urgent need for targeted interventions and policies to address these concerns among this vulnerable population

What can we do about it?

RECOMMENDATIONS

Sustainable Fishing Practices

Strengthen programs and training for the fishing sector to help support their livelihood and support the stability of their income.

Community-based Nutrition Programs

Reinforce health and nutrition programs regarding serving budget-friendly nutritious meals at home, starting at the barangay level.

Livelihood Support and Diversification

Establish livelihood support initiatives that enhance the economic stability of fishing households.

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