Gendered differences in nutritional status of fish-dependent households in Kerala, India

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Introduction

Nutritional status

- Diet is a vital determinant of health and nutritional status.

- The dietary habits of people, families and communities vary according to socioeconomic factors, regional constraints and traditions

Nutritional changes

- Changes in the lifestyle of people affecting the demography, food supply, eating patterns and overall health

- Even with dietary and nutrition transition due to technology advancement and increased food supply and availability, still imbalanced in nutritional status

Regional differences in nutritional status

- Nutrition transition is recognized as an emerging crisis in low income countries due to changing health profiles

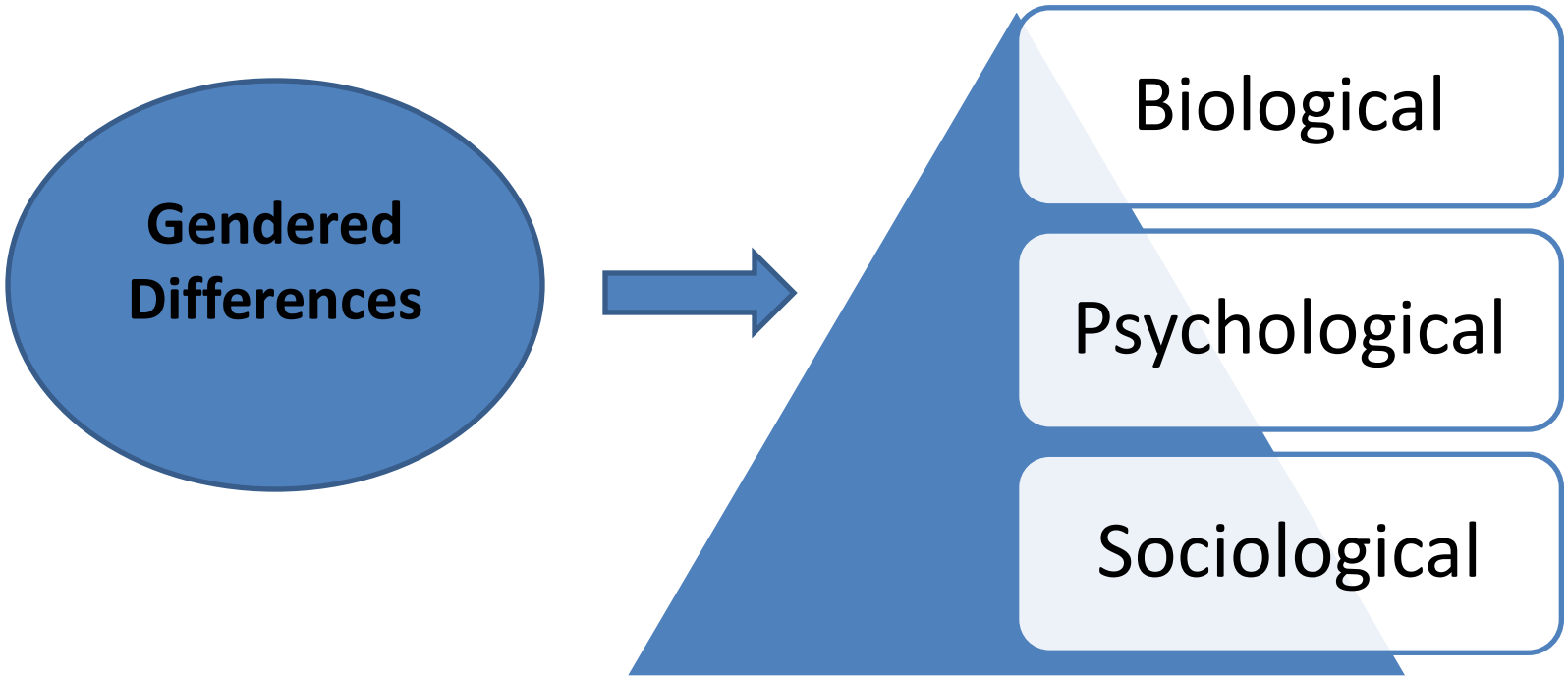
- The problem of undernutrition coexists along with overnutrition in countries such as India

Malnutrition

- Combatting malnutrition in all its forms is one of the greatest challenges all countries are facing
- Today, nearly one in three persons globally suffers from at least one form of malnutrition: undernutrition, vitamin and mineral deficiency, overweight or obesity and diet-related noncommunicable diseases (NCDs)

Gendered differences

- Gender – socio-cultural construct



Questions to be addressed?

- Gendered differences in nutritional status of fish-dependent households?
- Is existence of spatial variation between coastal and land locked regions ?
- Determinants of nutritional status

Methodology

Kerala Fisheries

Marine fishery has a prominent place in the economy of Kerala

Kerala	
Coastline	590km
Continental shelf	3.89 lakh sq. Km
Marine villages	222
Marine population	7.84
Population density (coastal areas)	2168persons/sq. km
Active fishermen	1.83lakh

Study area

- Kollam is the important maritime state of Kerala
- Mostly mechanised crafts
- Mainly trawlers

	South west coast of India
Revenue district	Kollam , Kerala
Latitutes	9◦10’ N and 8◦45’ E
Longitude	76◦25’ and 77◦15’
Sample village	Wadi (CV) Kottarakkara (LLV)
Sampling	Proportional random sampling
Sample size	300 households

* CV – Coastal Village; LLV – Landlocked village

Household (HH)

"persons routinely sharing food from the same cooking pot and living in the same compound or physical location"

Nutritional status is determined by,

- Medical history – Diagnosis
- Social history – education (literacy) and income (economic status)
- Others – Age, sex

Somatic status (Anthropometry)

Adult
- *Male*
- *Female*

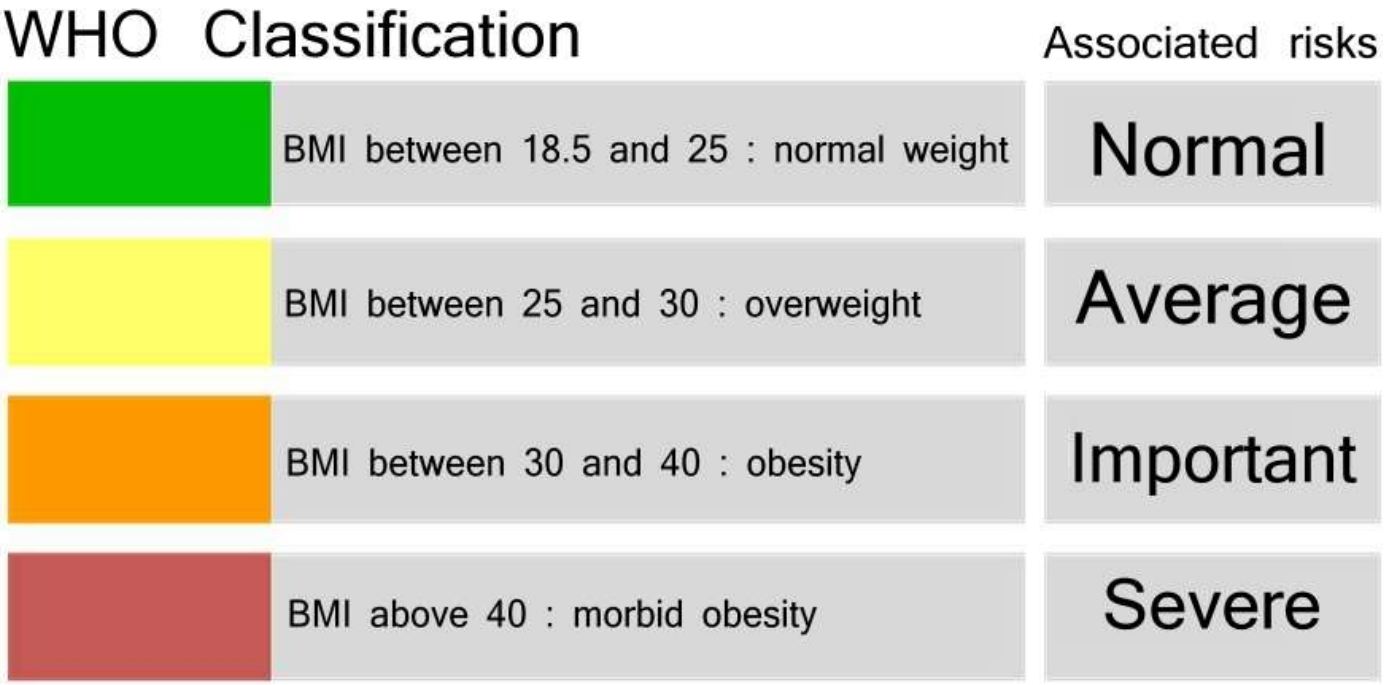
Adolescent
- *Male*
- *Female*

Children
- *Male*
- *Female*

Metric Formula

$$\text{Body Mass Index (BMI)} = \frac{Weight\ (kg)}{Height\ (m^2)}$$

BMI and associated risks



Highly accepted method worldwide

Age and BMI relation

NRC Classification

AGE	BMI
19 - 24	19 - 24
25 - 35	20-25
35 - 44	21 - 26
45 – 54	22-27
55 – 64	23-28
> 65	24-29

VULNERABILITY CHARACTERISTICS

- ❑ Main food source
- ❑ Source income
- ❑ Household income
- ❑ Dependency ratio
- ❑ Health status

Dietary pattern

- Dietary Assessment – Food consumption frequency
- Dietary intake survey – not included (24 hour recall
  - General
  - Fish

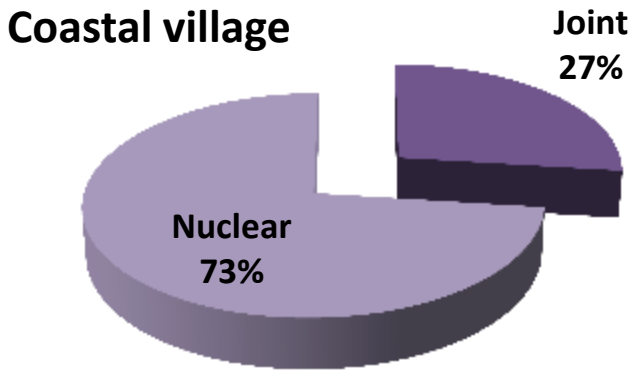
(Prakruthi and Prakash, 2013)

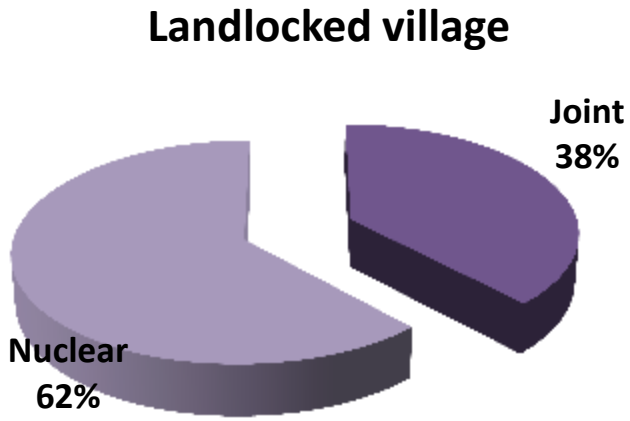
Results and Discussion

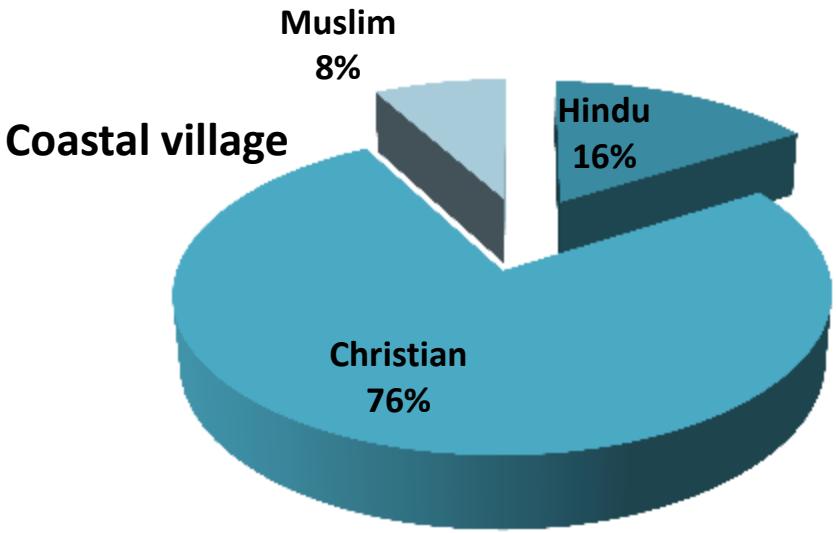
Profile of the household

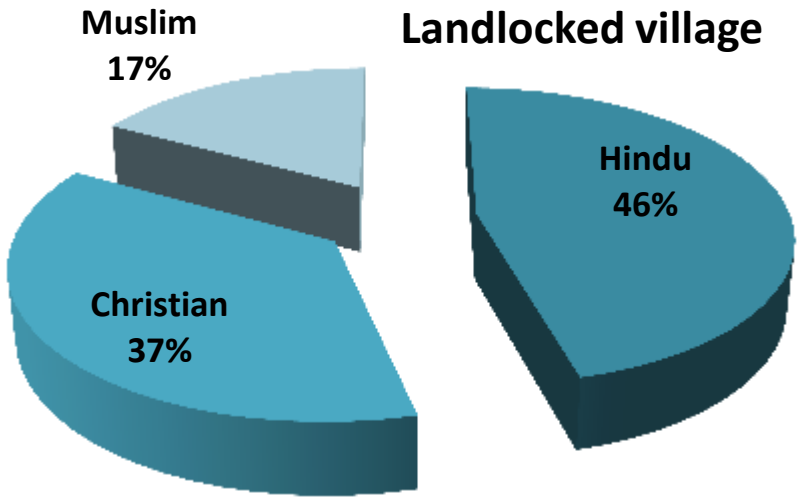
Particulars	Coastal Village	Land locked village
Household size	4.6	4.3
No. of working members	1.64	1.75
Average monthly income (Rs.)	8686.84	7847.29
n	200	100

Household type and religion



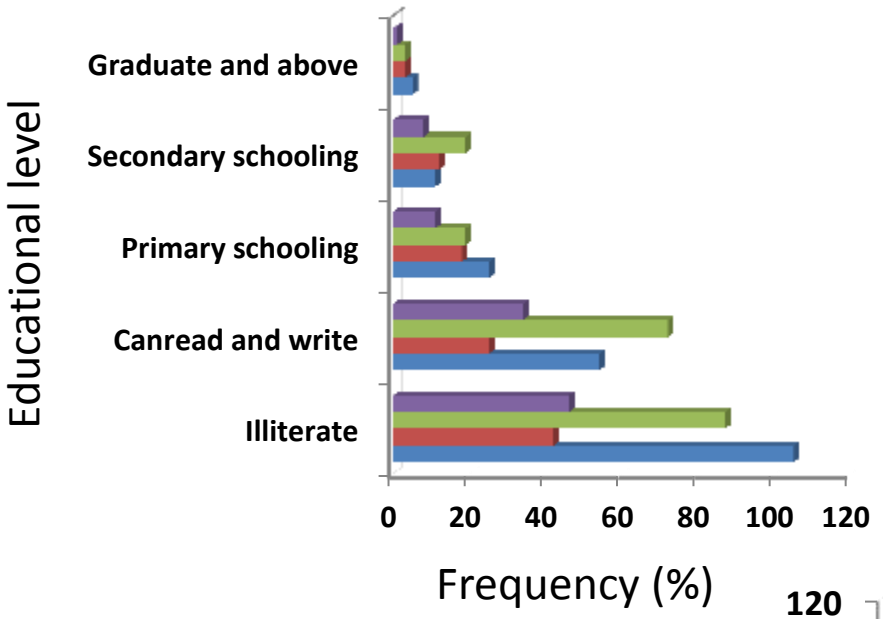






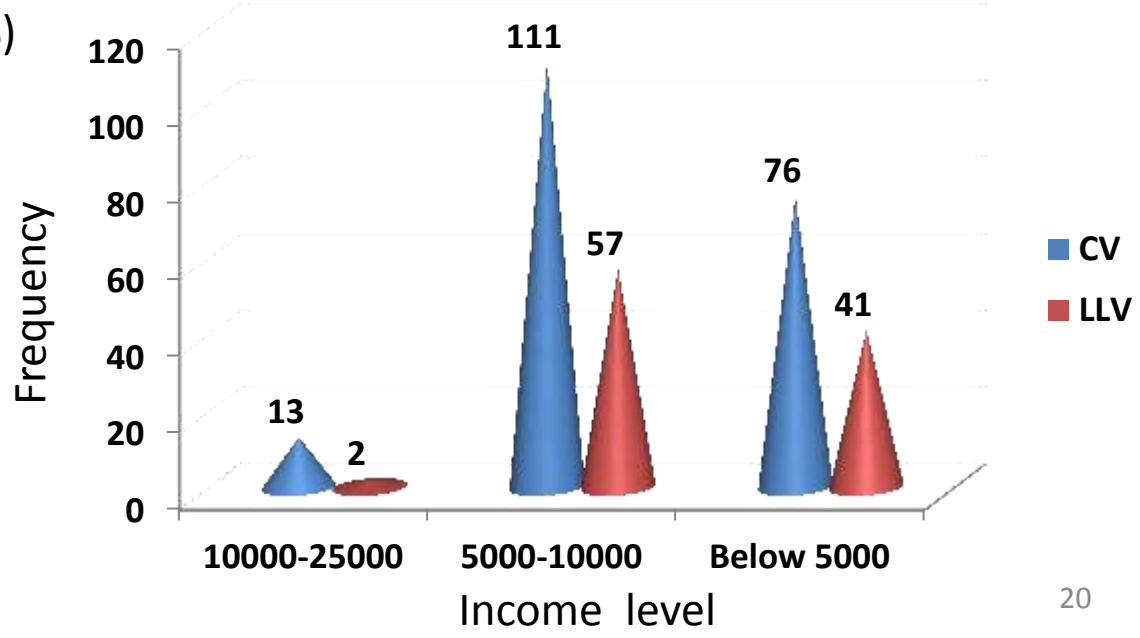
Christians constituted 43% of the fishermen families followed by Hindus (29%) and Muslims (28%). –CMFRI, 2010

Literacy and economic status

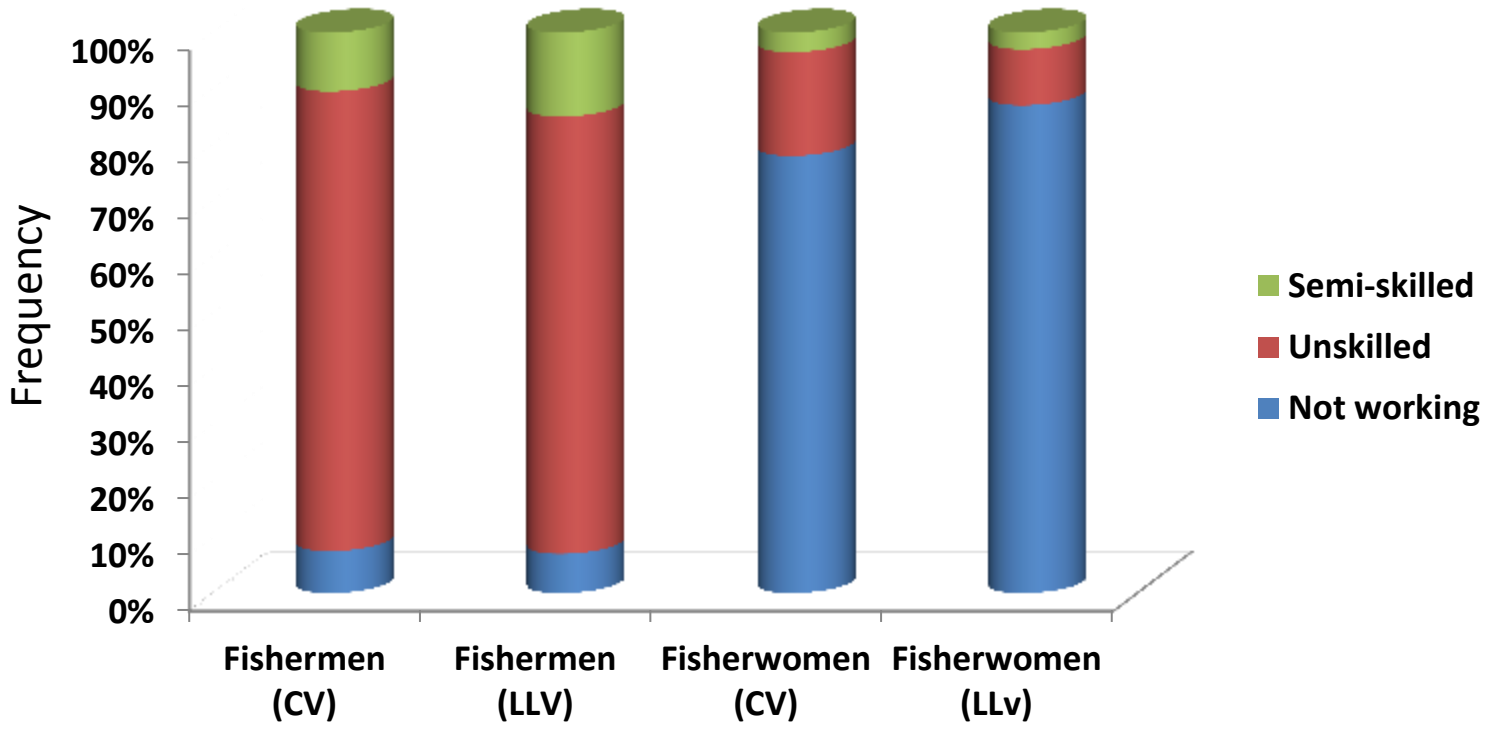


Literacy Status

Economic Status

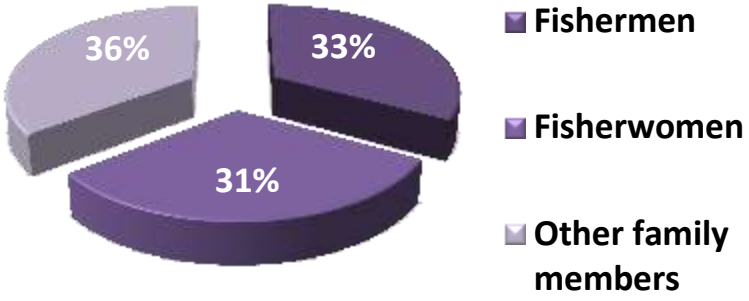


Job status

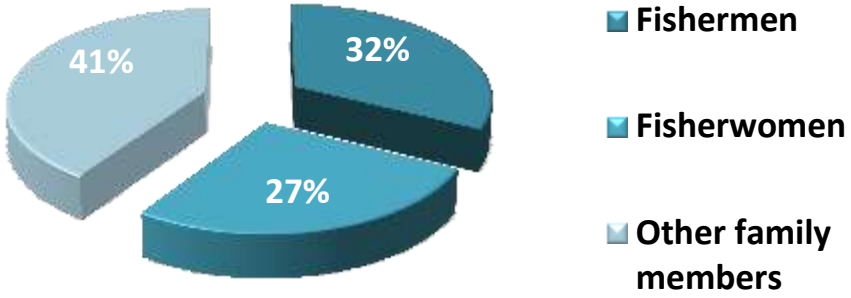

Frequency
100%
90%
80%
70%
60%
50%
40%
30%
20%
10%
0%
Fishermen (CV)
Fishermen (LLV)
Fisherwomen (CV)
Fisherwomen (LLv)
Semi-skilled
Unskilled
Not working

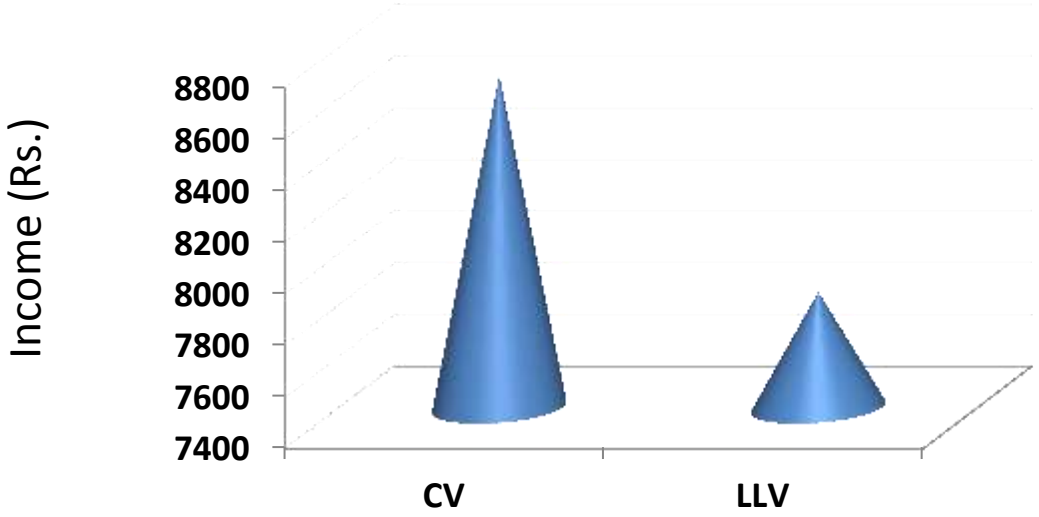
Income status

Coastal village



Landlocked village





Infrastructure facilities

Particulars	Coastal village	Land locked village
Type of house (%)		
i. Concrete	37	52
ii. Tiled	48	39
iii. Hut	15	9
Toilet facility (%)	100	100
Means of transport (%)		
i. Public transport	85	89
ii. Public transport & two wheeler	15	11
Drinking water source (%)		
i. Public tap	79	86
ii. Borewell	21	14

Details of the subjects

Particulars	Coastal village	Non-coastal village	Pooled
Adult_male	648 (49.39)	382 (58.23)	1030 (100.00)
Adult_female	504 (38.41)	294 (29.57)	698 (100.000
Adol_male	56 (4.27)	21 (3.20)	77 (100.00)
Adol_female	29 (2.21)	22 (3.35)	51 (100.00)
Child_male	42 3.20)	27 (4.12)	69 (100.00)
Child_female	33 (2.52)	10 (1.520	43 (100.00)
Total	1312 (100.00)	656 (100.00)	1968 (100.00)

Descriptive statistics of the subjects

Descriptive Statistics

Particulars	Range	Minimum	Maximum	Mean		Std. Deviation	Variance
	Statistic	Statistic	Statistic	Statistic	Std. Error	Statistic	Statistic
Adult_male_ht	44.00	153.00	197.00	166.82	0.63	5.94	35.39
Adult_male_wt	52	28	80	60.28	1.04	9.78	95.65
Adult_female_ht	20	150	170	157.01	0.36	3.24	10.50
Adult_female_wt	42	38	80	51.35	0.85	7.58	57.39
Adol_male_ht	60	105	165	122.27	3.12	14.64	214.40
Adol_male_wt	**104**	16	**120**	34.50	6.28	29.47	868.74
Adol_female_ht	60	100	160	120.70	6.31	19.95	397.79
Adol_female_wt	30	20	50	27.50	3.12	9.86	97.17
Child_male_ht	67	50	117	97.00	4.75	20.13	405.29
Child_male_wt	22	6	28	17.72	1.50	6.34	40.21
Child_female_ht	70	40	110	90.60	8.66	27.37	749.16

Food consumption frequency

Particulars	Coastal village	Land locked village
Frequency of fish consumption	Daily; two times	Daily; two times
Frequency of food intake (per day)	Three times	Three times
Preferred fish	Sardine, Mackerel	Sardine, Seerfish
Average fish consumption per week	500 gm	500gm
Expenditure for fish purchase per day	100	125

- Diet is mainly cereal based with less vegetables and fruits
- Fish is the compulsory component of daily diet

Nutritional status of fish dependent household in Kerala - Adult

- BMI >35 showed health risk

ADULTS

BMI status	Coastal village		Land locked village	
	Male	Female	Male	Female
Underweight	32 (4.94)	**178 (35.32)**	24 (6.28)	**102 (34.69)**
Normal weight	443 (68.36)	239 (47.42)	238 (62.30)	142 (48.30)
Over weight	116 (17.90)	36 (7.14)	85 (22.25)	23 (7.82)
Obese	36 (5.56)	32 (6.35)	19 (4.97)	14 (4.76)
Morbid Obese	21 (3.24)	19 (3.77)	16 (4.19)	13 (4.42)
Total	648 (100.00)	504 (100.00)	382 (100.00)	294 (100.00)

Nutritional status of fish dependent household in Kerala - Adolescent

ADOLESCENTS

BMI status	Coastal village		Land locked village	
	Male	Female	Male	Female
Underweight	27 (48.21)	**16 (55.17)**	11 (52.38)	**14 (63.64)**
Normal weight	24 (42.86)	11 (37.93)	7 (33.33)	7 (31.82)
Over weight	5 (8.93)	2 (6.90)	3 (14.29)	1 (4.55)
Obese	-	-	-	-
Morbid Obese	-	-	-	-
Total	56 (100.00)	29 (100.00)	21 (100.00)	22 (100.00)

Nutritional status of fish dependent household in Kerala - Children

CHILDREN

BMI status	Coastal village		Land locked village	
	Male	Female	Male	Female
Underweight	18 (42.86)	**12 (36.36)**	12 (44.44)	**15 (34.88)**
Normal weight	23 (54.76)	18 (54.55)	11 (40.74)	26 (60.47)
Over weight	2.38 (2.38)	3 (9.09)	4 (14.81)	2 (4.65)
Obese	-	-	-	-
Morbid Obese	-	-	-	-
Total	42 (100.00)	33 (100.00)	27 (100.00)	43 (100.00)

Age and BMI

AGE	BMI	Coastal village		Landloacked village	
		Male (%)	Female (%)	Male (%)	Female (%)
19 - 24	19 - 24	23	**39**	24	**33**
25 - 35	20-25	**27**	35	25	31
35 - 44	21 - 26	12	18	**27**	22
45 – 54	22-27	22	5	18	6
55 – 64	23-28	11	3	5	6
> 65	24-29	5	0	1	2

Factor analysis to determine the nutritional status

Kaiser-Meyer-Olkin and Bartlett's Test	
Measure of Sampling Adequacy	0.54
Test of Sphericity (Chi-Square)	39.78 **

Variance explained by the factor

Parameters	Component	
	1	2
Demographic status	0.12	-0.25
Literacy status	1.28	-0.02
Job status	1.19	0.31
Income status	0.47	0.58
Health status	0.56	0.82
Dietary pattern	0.77	0.53

Component Matrix		
Parameters	Component	
	1	2
Demographic status		0.45
Literacy status		0.68
Job status		0.42
Income status	-0.51	
Health status	0.65	
Dietary pattern	0.87	
Extraction Method: Principal Component Analysis		

Factor analysis contd...

Component Matrix		
	Component	
Parameters	**1**	**2**
Demographic status		0.56
Literacy status		0.75
Job status		
Income status	0.56	
Health status	0.68	
Dietary pattern	0.73	
Extraction Method: Principal Component Analysis		
Rotation Method: Varimax with Kaiser Normalization		

Conclusion

Conclusion

- There is apparent gender differences in the nutritional patterrn of fish dependent households.
- Women in underweight category are more (35%) compared to males in both the villages
- The proportion of underweight is more alarming among adolescent female
- Nearly 35% of children are falling in underweight category

Conclusion contd…..

- Age and BMI relation showed that the BMI is increased over the age in male category
- Income status, dietary pattern and health status are the factors determining the nutritional status of fish dependent household

Good nutrition is our first defence against disease and our source of energy to live and be active

-UN Decade of Action on Nutrition (2016-2025)

Thank you