

Addressing dietary imbalances through food based approach in Odisha

Gopinath R
M S Swaminathan Research Foundation
Chennai

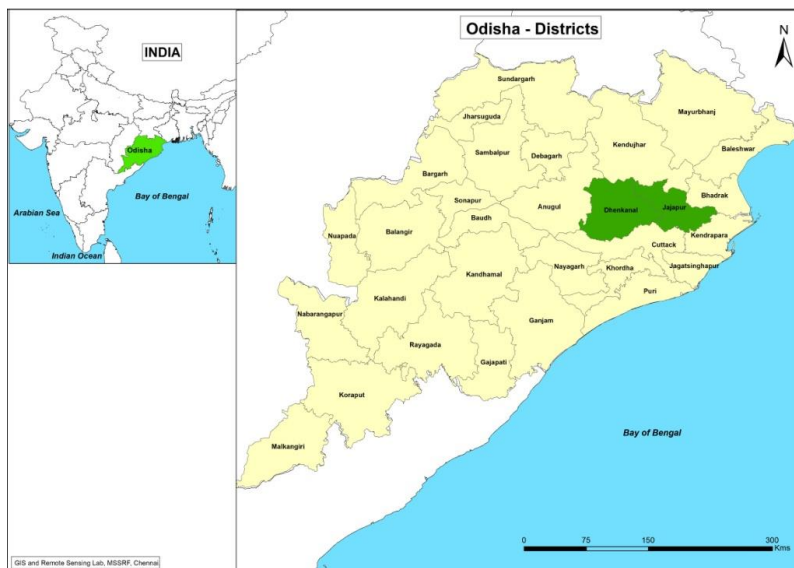


OBJECTIVE OF THE STUDY

- To understand the underlying causes of malnutrition, agricultural conditions (agro-ecological, water availability etc.), production systems and practices in Rengali irrigation project areas in Odisha, with a view to develop strategies to mainstream nutrition goals and promote nutrition sensitive agriculture**

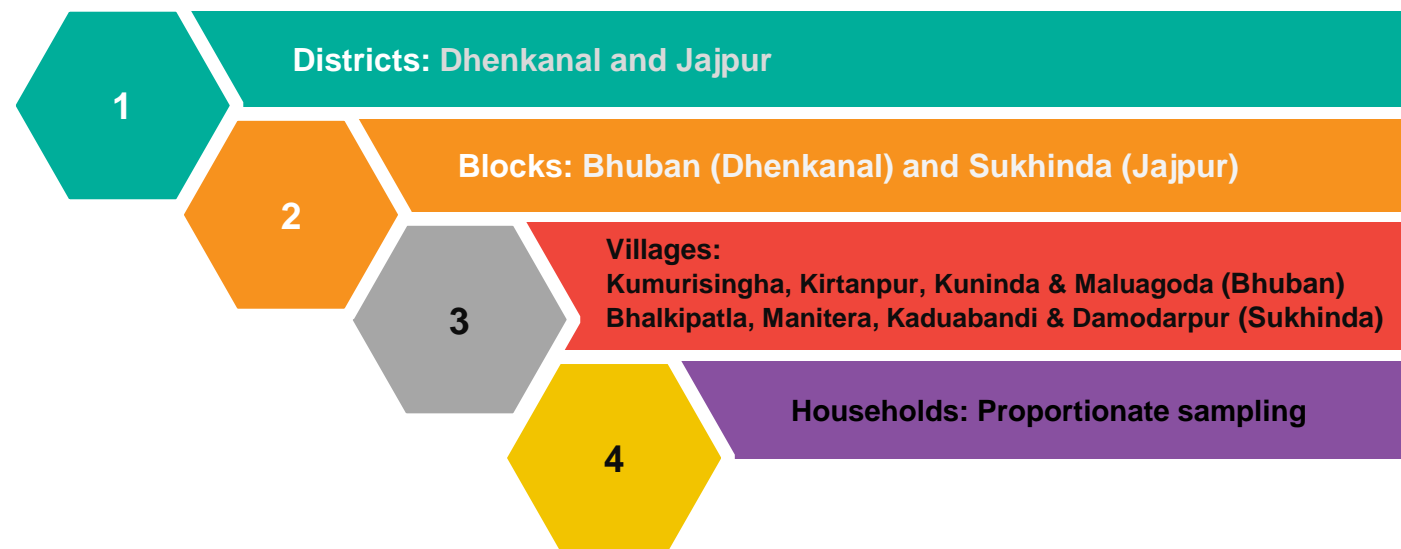
METHODOLOGY

- Four villages in each district were selected based on the list of indicators pointing to nutritional vulnerabilities
- Systematic stratified random sampling method was used to identify the study households in each village



Details of Identified Sample Villages in Odisha

District	Block	Villages
Dhenkanal	Bhuban	Kumurisingha, Kirtanpur, Kuninda and Maluagoda
Jajpur	Sukhinda	Bhalkipatla, Manitera, Kaduabandi and Damodarpur



Details of Samples studied in Odisha

Activity	Nos.
Household Survey	164
Nutrition Survey	164
Key Informant Interviews (KII) at village level	46
Focus Group Discussion at village level	40
KII at block & district level	15

METHODOLOGY

Dietary Assessment

- **Assessment of Nutrient Adequacy**
- **Dietary Diversity Score (DDS)**
- **Dietary Serving Score (DSS)**
- **Assessment of Dietary Diversity**
- **Nutrient Adequacy Ratio (NAR)**
- **Mean Adequacy Ratio (MAR)**

- ❑ **A detailed household survey with 328 households, 61 key informant interviews (village, block / district) and 40 focus grouped discussions were conducted in the selected areas.**

- ❑ **Prevailing agricultural production systems, nutritional assessments were examined and analysed using appropriate indices.**

Distribution of the Population based on the Body Mass Index Classification and Waist-Hip Ratio

BMI Classification	BMI (kg/m ²)	Percentage	
		Male	Female
Under-weight	18.5	8.06	24.84
Normal or lean BMI	18.5–22.9	61.29	10.97
Overweight	23.0 –24.9	24.19	38.06
Obese	≥25	6.45	26.13
Waist Hip Ratio		0.88	0.92

Food groups of cereals, pulses, vegetables and meat-based items produced in the villages.

- Cereals** : Paddy
- Pulses** : Black gram, green gram and horse gram
- Vegetable** : Drumstick, brinjal, ladies finger, pumpkin, ridge gourd, bitter gourd, amaranthus, tomato, chilly, and yam
- Meat** : Country chicken, goat / sheep
- Milk** : Indigenous cow

Other Food Groups consumption in the study

Food groups	Frequency	Period / season
Vegetables – Tomato, brinjal, ridge gourd, bhendi, bitter gourd, onion, pumpkin, chillies, yam, radish	Weekly	February to August
Vegetables – Beans, cucumber, carrot, cabbage, cauliflower, potato, mushroom	Weekly	Throughout the year
Pulses – Red gram, bengal gram and groundnut	Weekly / monthly	Throughout the year
Fruits – Guava, lemon, apple, pomegranate, grapes, banana	Monthly	Throughout the year
Cereals – Wheat	Monthly	Throughout the year
Meat – Fish and chicken	Weekly / monthly	Throughout the year

Food Consumption Pattern

Gender/ Food Composition	Cereals	Pulses, legumes & animal protein	Leafy vegetables	Other vegetables	Roots and tubers	Fruits	Milk and Milk products	Fats and oils
Male	432.43 ±32.23	97.22 ±12.33	14.94 ±2.34	68.45 ±1.56	21.48 ±9.12	6.10 ±1.2	52.56 ±9.89	10.58 ±1.2
RFC	275.00	80.00	100.00	200.00	100.00	150.00	300.00	25.00
Percentage Excess / Deficit	(+)57.25	(+)21.52	(-)85.06	(-)65.77	(-)78.52	(-)95.93	(-)82.48	(-)57.66
Female	303.39 ±24.34	50.96 ±10.21	13.90 ±1.23	76.97 ±1.44	24.21 ±3.43	4.92 ±1.3	52.88 ±6.34	7.05 ±1.02
RFC	300.00	90.00	100.00	200.00	100.00	150.00	300.00	20.00
Percentage Excess/ Deficit	(+)1.13	(-)43.38	(-)86.1	(-)61.52	(-)75.79	(-)96.72	(-)82.37	(-)64.77

Gender/ Nutrients	Energy* (KCal)	Protein (g)	Fat (g)	CHO (g)	Vit A (µg)	Thiamine (mg)	Riboflavin (mg)	Niacin (mg)	Iron (mg)	Zinc (mg)	Folate (µg)	Calcium (mg)
Male	2341 ±10.32	46.13 ±2.34	27.92 ±1.34	476.23 ±11.56	403.08 ±10.22	0.5 ±0.02	0.9 ±0.01	2.3 ±0.01	24.88 ±1.23	10.41 ±0.91	164.95 ±2.34	223.64 ±15.34
RDA	2110	65.00	25.00		1000.00	1.4	2.0	14	19.00	17.00	300.00	1000.00
Percentage Excess / Deficit	(+) 10.95	(-)29.21	(+)11.67		(-)59.69	(-)64.29	(-)55	(-)83.57	(-)30.92	(-)38.77	(-)45.02	(-)77.64
Female	1578 ±9.23	30.05 ±2.12	22.62 ±1.12	313.76 ±9.23	338.07 ±9.12	0.7 ±0.01	0.5 ±0.01	3.2 ±0.02	22.47 ±1.15	10.13 ±1.23	111.07 ±3.32	230.00 ±12.54
RDA	1660	55.00	20.00		900.00	1.4	1.9	11	29.00	13.20	220.00	1000.00
Percentage Excess / Deficit	(-)4.94	(-)45.37	(+)13.10		(-)62.44	(-)50	(-)73.68	(-)70.91	(-)22.52	(-)23.26	(-)50.48	(-)23.00

* EAR (ICMR, 2020)

Dietary Diversity Score

Food Groups	Male	Percent-age	Fem-ale	Percent-age
Starchy Staples	62	100.00	21	100.00
Dark green leafy vegetables	45	72.58	18	85.71
Other Vitamin a rich in vegetables and fruits	56	90.32	20	95.24
Other Fruits and Vegetables	12	19.35	10	47.62
Organ meat and fish	13	20.97	6	28.57
Eggs	16	25.81	10	47.62
Legumes, nuts, and seeds	53	85.48	19	90.48
Milk and milk products	57	91.94	19	90.48
Oil and Oil-based items	62	100.00	21	100.00

Mean Dietary Serving Score

Food Groups	No. Serving		Assigned Score
	Male	Female	
Starchy Staples	4	4	4
Legumes, nuts and seeds	2	1	2
Vegetables	1	1	4
Fruits	1	1	4
Organ meat and fish	2	1	2
Milk and milk products	1	1	4
Total	11	9	20

Distribution of Nutrition Adequacy Ratio and Mean Adequacy Ratio (MAR)

Nutrients	Male	Female
Energy (Kcal)	1	0.95
Protein (g)	0.71	0.54
Fat (g)	1	1.00
Vitamin A (mcg)	0.40	0.38
Iron (mg)	1	0.77
Zinc (mg)	1	0.77
Folate (mcg)	0.55	0.50
Calcium (mg)	0.22	0.23
Thiamine (mg)	0.36	0.50
Riboflavin (mg)	0.45	0.26
Niacin	0.16	0.29
Mean	6.86	6.20
MAR	0.62	0.56