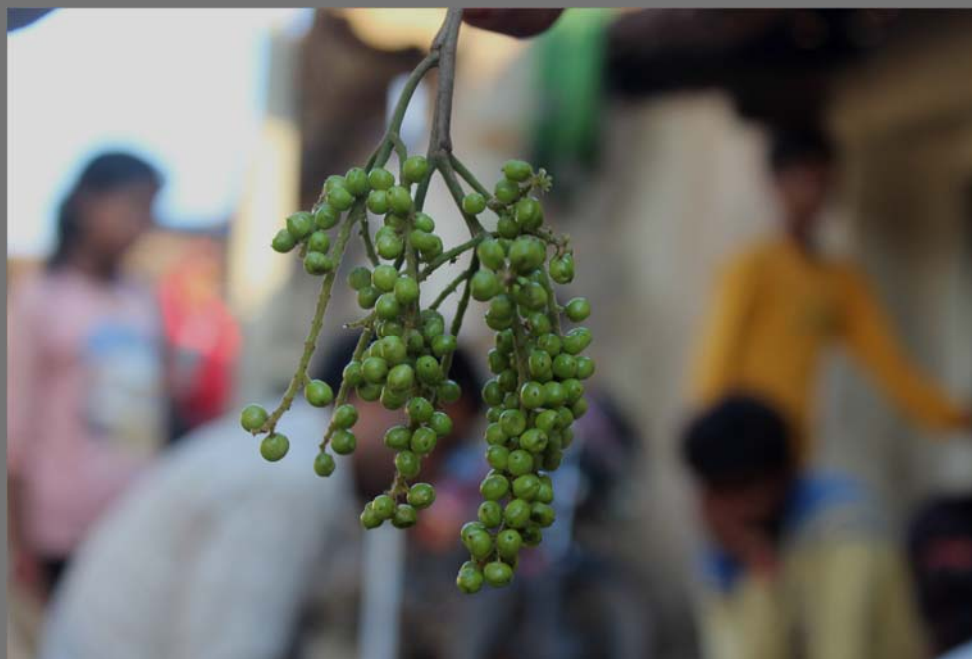
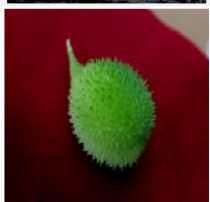
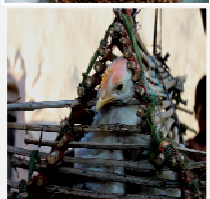


2019

Community Traditional Food Resource Mapping Study

CTFRM Research

A seek through to community traditional food resources



Farhat N.

For Vikas Samvad Samiti

12/7/2019



Abbreviations and Acronyms

AAy	Antyodaya Anna Yojana ANM
ANM	Auxiliary Nurse Midwife APL
ASHA	Accredited Social Health Activist
AWC	Anganwadi center AWW
AWW	Anganwadi Worker
BMI	Body Mass Index
BPL	below the poverty line
CBO	community-based organization
cm	centimeter
CRP	Community Resource Person
FAO	Food and Agriculture Organization
FGD	focus group discussion
FNS	food and nutrition security
FPS	Fair Price Shop
FRA	Forest Rights Act
FRC	Forest Rights Committee
FY	financial year
gms	gram
Gol	Government of India
ha	hectare
HCR	head count ratio
ICDS	Integrated Child Development Scheme
ICMR	Indian Council of Medical Research
IEC	Information, Education and Communication
IFA	Iron Folic Acid
IFR	Individual Forest Right
IHD	Institute of Human Development
IYCF	infant and young child feeding
IYCN	Infant and Young Child Nutrition
JSY	JananiSurakshaYojana
kg	kilogram
MDM	Mid-Day Meal
MGNREGA	Mahatma Gandhi National Rural Employment Guarantee Act MGNREGS
MoHFW	Ministry of Health and Family Welfare
NDCC	Nutrition Day Care Center NFHS
NFHS	National Family Health Survey NFSA
NFSA	National Food Security Act
NGO	nongovernmental organization
NIN	National Institute of Nutrition
NMR	neonatal mortality rate

NNMB	National Nutrition Monitoring Bureau
NRHM	National Rural Health Mission NRLM
NSSO	National Sample Survey Organization OBC
OBC	Other Backward Class
ODF	Open Defecation Free
PDS	Public Distribution System
PLA	Pregnant Lactating and Adolescent
PRI	Panchayat Raj institution
RDA	recommended dietary allowance
RMNCH+A	Reproductive, Maternal, Child and Adolescent Health
SC	Scheduled Caste
SHG	self-help group
SRLM	State Rural Livelihood Mission
ST	Scheduled Tribe
TABA	tribal and backward area
TSC	Total Sanitation Campaign
VHND	Village Health and Nutrition Day WASH
WASH	Water, Sanitation and Hygiene
WHO	World Health Organization

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Executive and Statistical Summary

Consumption of micronutrients may prevent micronutrient deficiencies and even can eliminate it, further ameliorate the nutritional status. Different strategies to tackle micronutrient deficiencies are supplementation of micronutrients to targeted populations, dietary diversification, nutrition education, along with other public health measures including WASH programmes, deworming, support to breastfeeding, and vaccination programmes. Over the past few years, government of India has already invested into number of programmes to expand the coverage and enhance the nutrition security situation with a special focus to improve current micronutrient deficiencies. However, all approaches fall of tracks rooting dearth of programs that targets in fulfilling the longing nutritional needs of the vulnerable groups and masses.

Alleviating malnutrition and bettering up the nutritional status, is a step towards achieving SDG 2.0 i.e. zeros hunger. The global nutrition targets as adopted by WHO laid emphasis on MIYCN, diminishing all forms of malnutrition including stunting wasting and reducing one third of premature mortality. One optional advent could be embracing an ecosystem approach in farming and rural management with an importance on traditional and native coping strategies.

Petite and trivial families in rural areas in India countenance a divergent shift in food and nutritional practices. Current food habits are by and large related with Public Distribution System, cultivation and other agriculture surroundings in the vicinity and market driven forces. With the advent of Green Revolution in India, wheat turned out to be a major staple food on small and marginal families' plate. Earlier the nutrition transition, local grains and millets including *maize, bajra, kodo, kutki, bavta, kang, barley, brown rice*, were obtained for conventional meals and recipes as a common practice in traditional cooking.

Multifarious of traditional foods resources including both from plant as well as animals have been documented to have been rich with high food, nutrition and medicinal value. Howbeit, the nutrient contents of these food resources is still a missing link and are under documented respite of several studies on food systems in various parts of India focusing on traditional food system. Thus, the present study is undertaken in the larger context to revive back the nutrition sensitive agriculture and food system to propose the policy idea to be adopted for the community emphasizing on use of locally/traditional food.

It involves documenting and mapping traditional food resources, with its identification and taxonomic classification (if required), followed by nutrient composition analysis, nutritive value, consumption pattern by population and vulnerable groups including IPLA (Infant, Pregnant and Lactating mothers and Adolescents) and elders, existing and traditional diets, comparison with RDA, missing links and revisionary plan for policies.

The objectives is to gather relevant pieces of information to identify gaps and needs in the community and analyzing the services, resources and systems that can be further utilized to fulfill those gaps and meeting the nutritional requirement. This would help in understanding –

1. Status of community people
2. Availability of community traditional food resources
3. Capacity of the available resources

The study has some limitations such as-

- Data collected is based on tribal's information regarding consumption of food, availability of traditional foods, use of wild cultivation and NTFPs, which varied individual to individual and community to community even on similar notions. This could lead to data imprecision. Researcher crosschecked the data to make it reliable and precise.
- The study cannot be oversimplified and implied for other locations because of its pertinence to a particular location especially to tribal confined zones which has drastic difference than any other community belonging to same village or hamlet
- The study focused on the availability of traditional food, in particular and their consumption and storage pattern, which is however is influenced by the seasonal impact. The same set of data could be different for different seasons.

This study was consumed as a step ahead to “study on 1000 days cycle of child” that concluded on carrying out a full-fledged intensive research on the availability and use of the local foods, vegetables and fruits across the villages in the project districts(Panna, Satna, Rewa and Umaria). So that, it could appropriate food, fruit and vegetable groups keeping the needs for energy intake as well as that of the essential micronutrients as part of essential diet plan, both for the women of the reproductive age-group of 15 to 49 years, pregnant women, lactating mothers and children upto 2 years.

Thus the proposed geography for the present study was conducted in five districts of Madhya Pradesh namely -

1. Umaria (Baghelkhand region)
2. Satna (Baghelkhand region)
3. Rewa (Baghelkhand region)
4. Panna (Bundelkhand region) and
5. Niwari (Bundelkhand region)

The key findings are cross checked with NFHS- data for Madhya Pradesh to have an insight of where the study area dictates. Major findings are –

- Poor Consumption and insufficient dietary diversity are blockades to nutrition outcomes for Tribals
- tribal children and PLA adult come much below the Recommended Dietary Allowances set by the Indian Council of Medical Research, meticulously deficient in protein, energy and other important micronutrients like iron, calcium, vitamin A
- STs leads in few indicators of Maternal health including EBF, EIB etc but are lag behind in other indices
- Most Scheduled Tribes face gap in WASH and Sanitation facilities, that play crucial role in nutrition.
- The trends of Undernutrition both in PLAs and Infants are at rising alerts compared to that of NFSA.
- The major livelihood problems have given rise to migration which has its own implication on health of mother and child.
- ~~Information on regular consumption expenditure by the households from NSSO 66th round reveals a significant difference in food expenditure between tribal and nontribal groups~~
- The key findings in stats are laid down in Table 1

Statistical Summary

Table 0.1: Statistical Summary of Key Findings

SN	Health Indices	Niwari	% age against Normal values	Panna	% age against Normal values	Rewa	% age against Normal values	Satna	% age against Normal values	Umaria	% age against Normal values	All	% age against Normal values	Where n =
1	Demographical stats													
A	Overall													
i	Male	134.0	10%	114.0	8%	152.0	11%	153.0	11%	125.0	9%	678.0	49%	1374.0
ii	Female	146.0	11%	116.0	8%	131.0	10%	172.0	13%	131.0	10%	696.0	51%	1374.0
iii	Total members	280.0	20%	230.0	17%	283.0	21%	325.0	24%	256.0	19%	1374.0	100%	1374.0
iv	Scheduled Tribes	11.0	4%	47.0	19%	39.0	16%	43.0	17%	40.0	16%	180.0	72%	250.0
v	Scheduled Caste	2.0	1%	3.0	1%	0.0	0%	1.0	0%	0.0	0%	6.0	2%	250.0
vi	OBC	33.0	13%	0.0	0%	8.0	3%	6.0	2%	9.0	4%	56.0	22%	250.0
vii	General	4.0	2%	0.0	0%	3.0	1%	0.0	0%	1.0	0%	8.0	3%	250.0
B	Population of PLAs													
i	Scheduled Tribes	10.0	7%	26.0	17%	29.0	19%	30.0	20%	22.0	15%	117.0	78%	150.0
ii	Scheduled Caste	15.0	10%	4.0	3%	1.0	1%	0.0	0%	8.0	5%	28.0	19%	150.0
iii	Others	5.0	3%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	8.0	5%	150.0
C	Population of infants													
i	Scheduled Tribes	7.0	7%	16.0	16%	17.0	17%	20.0	20%	15.0	15%	75.0	75%	100.0
ii	Scheduled Caste	3.0	3%	4.0	4%	3.0	3%	0.0	0%	5.0	5%	15.0	15%	100.0
iii	OBC	10.0	10%	0.0	0%	0.0	0%	0.0	0%	0.0	0%	10.0	10%	100.0
D	Total Population (HH+PLAs+Infants)													
i	Total	100.0	20%	100.0	20%	100.0	20%	100.0	20%	100.0	20%	500.8	100%	500.0
	Mean													
	SD	52.8												
ii	Scheduled Tribes	28.0	6%	89.0	18%	85.0	17%	93.0	19%	77.0	15%	372.0	74%	500.0
iii	Scheduled Caste	20.0	4%	11.0	2%	4.0	1%	1.0	0%	13.0	3%	49.0	10%	500.0
iv	Others	52.0	10%	0.0	0%	11.0	2%	6.0	1%	10.0	2%	79.8	16%	500.0
2	Source of Drinking water													
i	Protected Wells	8.0	16%	1.0	2%	0.0	0%	0.0	0%	15.0	30%	24.0	10%	50.0
ii	Public tap	35.0	70%	42.0	84%	1.0	2%	14.0	28%	1.0	2%	93.0	37%	50.0
3	Status of Defecation													
i	Any facility	70.0	140%	45.0	90%	9.0	18%	21.0	42%	10.0	20%	155.0	62%	50.0
ii	No facility	3.0	6%	32.0	64%	49.0	98%	34.0	68%	33.0	66%	151.0	60%	50.0
iii	ODF	33.0	66%	6.0	12%	1.0	2%	15.0	30%	2.0	4%	57.0	23%	50.0
4	Illness													
i	Male members got ill in last 15 days	1.0	2%	0.0	0%	7.0	14%	8.0	16%	11.0	22%	27.0	11%	1374.0
ii	FeMale members got ill in last 15 days	0.0	0%	5.0	10%	17.0	34%	8.0	16%	7.0	14%	37.0	15%	1374.0
iii	Children below 5 years who got ill	0.0	0%	0.0	0%	7.0	14%	4.0	8%	0.0	0%	11.2	4%	1374.0
5	Treatments													
i	Public health facilities	37.0	74%	0.0	0%	1.0	2%	26.0	52%	6.0	12%	4.0	2%	50.0
ii	Admitted during past month	17.0	34%	1.0	2%	8.0	16%	3.0	6%	4.0	8%	1.0	0%	50.0
6	Health Practices (IPLA)													
A	General													
i	Using Mosquito	0.0	0%	45.0	90%	16.0	32%	24.0	48%	21.0	42%	106.0	42%	50.0

	nets while sleeping													
ii	Deworming Status	0.0	0%	0.0	0%	27.0	54%	3.0	6%	2.0	4%	32.0	13%	50.0
iii	Smoking by respondent	29.0	58%	15.0	30%	27.0	54%	37.0	74%	11.0	22%	119.0	48%	50.0
B	PLA Specific													
i	Anganwadi Visit PLA	30.0	20%	28.0	19%	22.0	15%	25.0	17%	30.0	20%	135.0	90%	150.0
ii	IFA intake	29.0	19%	22.0	15%	17.0	11%	17.0	11%	24.0	16%	109.0	73%	150.0
iii	Institutional delivery	18.0	12%	18.0	12%	16.0	11%	20.0	13%	20.0	13%	92.0	61%	150.0
iv	CHC	18.0	12%	0.0	0%	4.0	3%	20.0	13%	18.0	12%	60.0	40%	150.0
v	District Hospitals	0.0	0%	18.0	12%	0.0	0%	0.0	0%	2.0	1%	20.0	13%	150.0
vi	PHC	0.0	0%	0.0	0%	12.0	8%	0.0	0%	0.0	0%	12.0	8%	150.0
viiv	Meal Pattern		0%		0%		0%		0%		0%		0%	150.0
viii	2-3 Times (T)	16.0	11%	22.0	15%	5.0	3%	22.0	15%	11.0	7%	76.0	51%	150.0
ix	Rest Patterns		0%		0%		0%		0%		0%		0%	150.0
x	2 hours	18.0	12%	21.0	14%	21.0	14%	29.0	19%	30.0	20%	119.0	79%	150.0
7	Infant Young Child Nutrition (IYCN) Practices													
i	Early initiation of breastmilk	18.0	36%	18.0	36%	16.0	32%	20.0	40%	20.0	40%	92.0	37%	50.0
ii	Breastmilk within an hour	12.0	24%	4.0	8%	12.0	24%	10.0	20%	12.0	24%	50.0	20%	50.0
iii	Breastmilk between 1-2 hours of child birth	4.0	8%	2.0	4%	0.0	0%	10.0	20%	4.0	8%	20.0	8%	50.0
iv	Breastmilk after 2 hours	4.0	8%	14.0	28%	6.0	12%	0.0	0%	2.0	4%	26.0	10%	50.0
v	Colostrum Feeding	19.0	38%	11.0	22%	17.0	34%	16.0	32%	16.0	32%	79.0	32%	50.0
vi	Exclusive breastfeeding	10.0	20%	8.0	16%	10.0	20%	20.0	40%	17.0	34%	65.0	26%	50.0
viiv	Breastfeeding less than 6 months	1.0	2%	7.0	14%	0.0	0%	0.0	0%	3.0	6%	11.0	4%	50.0
viii	Prelacteal feeds	3.0	6%	10.0	20%	5.0	10%	15.0	30%	5.0	10%	38.0	15%	50.0
ix	Complimentary feeding	10.0	20%	7.0	14%	9.0	18%	7.0	14%	10.0	20%	43.0	17%	50.0
x	Before 6 months	1.0	2%	0.0	0%	0.0	0%	0.0	0%	3.0	6%	4.0	2%	50.0
xi	At 6 months	9.0	18%	7.0	14%	8.0	16%	7.0	14%	7.0	14%	38.0	15%	50.0
xii	After 9 months	0.0	0%	0.0	0%	1.0	2%	0.0	0%	0.0	0%	1.0	0%	50.0
xiii	Not giving at all	0.0	0%	3.0	6%	1.0	2%	3.0	6%	0.0	0%	7.0	3%	50.0
8	Nutritional Status													
A	Weight for Age : Undernutrition													
i	Normal	17.0	17%	13.0	13%	16.0	16%	16.0	16%	15.0	15%	77.0	77%	100.0
ii	Moderate	2.0	2%	3.0	3%	3.0	3%	3.0	3%	2.0	2%	13.0	13%	100.0
iii	Severe	1.0	1%	4.0	4%	1.0	1%	1.0	1%	3.0	3%	10.0	10%	100.0
B	Height for age : Stunting													
i	Normal	12.0	12%	13.0	13%	8.0	8%	4.0	4%	11.0	11%	48.0	48%	100.0
ii	Moderate	5.0	5%	4.0	4%	8.0	8%	12.0	12%	5.0	5%	34.0	34%	100.0
iii	Severe	3.0	3%	3.0	3%	4.0	4%	4.0	4%	4.0	4%	18.0	18%	100.0
C	Weight for height : Wasting													
i	Normal	11.0	11%	5.0	5%	10.0	10%	12.0	12%	4.0	4%	42.0	42%	100.0
ii	Moderate	3.0	3%	1.0	1%	4.0	4%	5.0	5%	11.0	11%	24.0	24%	100.0
iii	Severe	6.0	6%	14.0	14%	6.0	6%	3.0	3%	5.0	5%	34.0	34%	100.0
D	Anthropometry Indicators													
D1	Pregnant													

D2	i	Normal BMI 18-23	7.0	14%	7.0	14%	5.0	10%	7.0	14%	7.0	14%	33.0	66%	50.0
	ii	Underweight BMI <18	2.0	4%	2.0	4%	1.0	2%	1.0	2%	1.0	2%	7.0	14%	50.0
	iii	Overweight - BMI 18-23	1.0	2%	1.0	2%	4.0	8%	2.0	4%	2.0	4%	10.0	20%	50.0
		Lactating													
	i	Normal BMI 18-23	5.0	10%	7.0	14%	6.0	12%	7.0	14%	6.0	12%	31.0	62%	50.0
	ii	Underweight BMI <18	5.0	10%	2.0	4%	3.0	6%	3.0	6%	3.0	6%	16.0	32%	50.0
	iii	Overweight - BMI 18-23	0.0	0%	1.0	2%	1.0	2%	0.0	0%	1.0	2%	3.0	6%	50.0
		Adolescent													
D3	i	Normal BMI 18-23	6.0	12%	6.0	12%	4.0	8%	6.0	12%	1.0	2%	23.0	46%	50.0
	ii	Underweight BMI <18	4.0	8%	4.0	8%	6.0	12%	4.0	8%	9.0	18%	27.0	54%	50.0
	iii	Body measures													50.0
D4		Mean Weight (IPLA)													
9	i	Pregnant mothers	48.1	87%	49.2	89%	48.0	87%	44.7	81%	50.9	93%	48.2	88%	55.0
	ii	Lactating mothers	44.2	80%	42.8	78%	44.7	81%	44.5	81%	44.3	81%	44.1	80%	55.0
	iii	Adolescent	41.2	92%	40.4	91%	39.1	88%	40.2	90%	36.0	81%	39.4	88%	45.0
	iv	Children 12-24 months	7.9	61%	8.3	64%	8.4	65%	7.6	59%	8.2	64%	8.2	63%	13.0
Clinical Assessment															
A		Physical Appearance													
B	i	Normal	6.0	12%	8.0	16%	8.0	16%	4.0	8%	3.0	6%	29.0	58%	50.0
	ii	Severe Malnourished	1.0	2%	0.0	0%	1.0	2%	2.0	4%	3.0	6%	7.0	14%	50.0
	iii	Malnourished	3.0	6%	1.0	2%	1.0	2%	4.0	8%	4.0	8%	13.0	26%	50.0
C		Hair													
D	i	Normal	7.0	14%	7.0	14%	4.0	8%	2.0	4%	4.0	8%	24.0	48%	50.0
	ii	Lack of natural shine; hair dull and dry; thin and sparse; hair	3.0	6%	3.0	6%	6.0	12%	8.0	16%	7.0	14%	27.0	54%	50.0
		Eyes													
E	i	Normal	7.0	14%	9.0	18%	5.0	10%	1.0	2%	5.0	10%	27.0	54%	50.0
	ii	Pale	3.0	6%	1.0	2%	4.0	8%	7.0	14%	5.0	10%	20.0	40%	50.0
	iii	Heavy	0.0	0%	0.0	0%	1.0	2%	2.0	4%	0.0	0%	3.0	6%	50.0
F		Mouth													
G	i	Normal	10.0	20%	10.0	20%	9.0	18%	8.0	16%	10.0	20%	47.0	94%	50.0
	ii	Wounds on sides of mouth	0.0	0%	0.0	0%	1.0	2%	2.0	4%	0.0	0%	3.0	6%	50.0
		Face													
H	i	Skin color uniform; smooth, pink, healthy appearance; not swollen	9.0	18%	8.0	16%	8.0	16%	3.0	6%	10.0	20%	38.0	76%	50.0
	ii	Skin color loss (depigmentation	1.0	2%	2.0	4%	2.0	4%	7.0	14%	0.0	0%	12.0	24%	50.0
	iii	lumpiness or flakiness of skin of nose and mouth;	1.0	2%	1.0	2%	1.0	2%	5.0	10%	0.0	0%	8.0	16%	50.0
I		Tongue													
J	i	Deep red in appearance; not swollen or smooth	9.0	18%	10.0	20%	9.0	18%	7.0	14%	10.0	20%	45.0	90%	50.0
	ii	Swelling; scarlet and raw tongue	1.0	2%	0.0	0%	1.0	2%	3.0	6%	0.0	0%	5.0	10%	50.0

G	Skin														
	i	No signs of rashes, swellings, dark or light spots	9.0	18%	10.0	20%	8.0	16%	7.0	14%	10.0	20%	44.0	88%	50.0
	ii	Dryness of skin (xerosis);	1.0	2%	0.0	0%	2.0	4%	3.0	6%	0.0	0%	6.0	12%	50.0
10	Locally Available Food														
	i	Identified	107.0	40%	102.0	38%	138.0	51%	104.0	39%	158.0	59%	234.0	87%	270.0
	ii	Unidentified	9.0	3%	12.0	4%	12.0	4%	9.0	3%	5.0	2%	36.0	13%	270.0
	iii	Plant origin	59.0	22%	63.0	23%	85.0	31%	63.0	23%	84.0	31%	234.0	87%	270.0
	iv	Animal Origin	27.0	10%	19.0	7%	33.0	12%	21.0	8%	54.0	20%	36.0	13%	270.0
	v	March-June	32.0	14%	23.0	10%	30.0	13%	23.0	10%	35.0	15%	143.0	61%	234.0
	vi	July-October	26.0	11%	18.0	8%	19.0	8%	17.0	7%	20.0	9%	100.0	43%	234.0
	viiiv	Nov-Feb	55.0	24%	38.0	16%	46.0	20%	41.0	18%	54.0	23%	234.0	100%	234.0
	viii	Summer	41.0	18%	30.0	13%	38.0	16%	30.0	13%	41.0	18%	57.0	24%	234.0
	ix	Rainy	23.0	10%	15.0	6%	16.0	7%	14.0	6%	17.0	7%	25.0	11%	234.0
	x	Winter	68.0	29%	49.0	21%	55.0	24%	49.0	21%	62.0	26%	86.0	37%	234.0
	xi	Rabi	66.0	28%	69.0	29%	102.0	44%	71.0	30%	116.0	50%	198.0	85%	234.0
	xii	Kharif	71.0	30%	71.0	30%	106.0	45%	76.0	32%	120.0	51%	204.0	87%	234.0
	xiii	Available	67.0	29%	72.0	31%	101.0	43%	74.0	32%	118.0	50%	192.0	82%	234.0
	xiv	Threatened	6.0	3%	8.0	3%	9.0	4%	6.0	3%	8.0	3%	26.0	11%	234.0
	xv	Extinct	6.0	3%	4.0	2%	5.0	2%	2.0	1%	6.0	3%	11.0	5%	234.0
	xvi	Food grown in the native	40.0	21%	43.0	22%	51.0	27%	42.0	22%	68.0	35%	97.0	51%	192.0
	xvii	Food Brought from the market	27.0	14%	29.0	15%	50.0	26%	32.0	17%	50.0	26%	95.0	49%	192.0
	xviii	Good grown here and is sent on commercial purpose	37.0	19%	40.0	21%	48.0	25%	40.0	21%	65.0	34%	94.0	49%	192.0
11	Dietary Analysis														
A	Children 6-24 months														
	i	Whole milk	6.0	12%	9.0	18%	3.0	6%	4.0	8%	2.0	4%	24.0	10%	150.0
	ii	Mean Age of feeding whole milk	7.5	15%	7.0	14%	8.5	17%	4.0	8%	2.0	4%	5.8	2%	150.0
	iii	Solid	9.0	18%	2.0	4%	9.0	18%	7.0	14%	8.0	16%	35.0	14%	150.0
	iv	Semi-solid	4.0	8%	5.0	10%	7.0	14%	3.0	6%	7.0	14%	26.0	10%	150.0
	v	Liquid	8.0	16%	3.0	6%	9.0	18%	6.0	12%	8.0	16%	34.0	14%	150.0
	vi	Food in grams (Infant)		0%		0%		0%		0%		0%		0%	150.0
	viiiv	Cereals and grains	120.0	200%	71.4	119%	66.7	111%	71.4	119%	60.0	100%	6069.2	10115%	RDA
	ix	Pulses and legumes	12.5	42%	0.0	0%	55.0	183%	0.0	0%	0.0	0%	182.3	608%	RDA
	x	Dark Green leafy vegetables	25.0	50%	45.0	90%	5.0	10%	10.0	20%	30.0	60%	529.0	1058%	RDA
	xi	Other vegetables	70.0	140%	45.0	90%	45.0	90%	25.0	50%	40.0	80%	2025.0	4050%	RDA
	xii	Roots and tubers	23.0	46%	27.0	54%	10.0	20%	0.0	0%	35.0	70%	361.0	722%	RDA
	xiii	Meat and poultry	30.0	60%	10.0	20%	25.0	50%	15.0	30%	20.0	40%	400.0	800%	RDA
	xiv	Fish and trouts	10.0	20%	40.0	80%	10.0	20%	0.0	0%	20.0	40%	256.0	512%	RDA
	xv	Milk and Milk Products	59.0	12%	106.0	21%	28.0	6%	40.0	8%	27.0	5%	2704.0	541%	RDA
	xvi	Fats and oils	1.0	4%	2.0	8%	2.5	10%	0.0	0%	2.5	10%	2.6	10%	RDA
	xvii	Fruits	26.5	27%	29.0	29%	2.0	2%	3.0	3%	20.5	21%	262.4	262%	RDA
	xviii	Sugar Products	4.0	27%	6.0	40%	1.0	7%	0.0	0%	4.0	27%	9.0	60%	RDA
	xix	NTFP	0.0		10.5		0.0		0.0		30.0		65.6		RDA

xx	biscuit 1 biscuit = 5.5 gms	6.7		3.0		6.0		3.0		3.4		3.0		RDA
xxi	kurura = 1 packet = 30 gms	0.6		0.2		0.5		0.2		0.5		0.4		RDA
B	Food in grams (PLAs)													
i	Cereals and grains	97.6	34%	97.9	34%	93.4	32%	113.9	39%	124.1	43%	105.4	36%	RDA
ii	Pulses and legumes	6.2	6%	11.0	11%	10.6	11%	6.8	7%	12.6	13%	22.3	22%	RDA
iii	Fats and oils	10.3	34%	12.9	43%	11.8	5%	8.0	27%	9.9	33%	28.1	94%	RDA
iv	GLV	19.4	8%	26.7	11%	23.0	23%	18.9	8%	26.3	11%	130.4	52%	RDA
v	Other vegetables	30.0	30%	25.5	26%	20.2	20%	22.7	23%	31.3	31%	168.1	168%	RDA
vi	Roots and Tubers	22.0	22%	32.4	32%	30.9	31%	21.7	22%	13.7	14%	145.7	146%	RDA
viii	Sugar Products	3.2	16%	2.6	13%	2.2	11%	1.9	9%	5.3	26%	2.3	11%	RDA
ix	Fruits	7.6	5%	6.9	4%	4.5	1%	3.8	2%	6.4	4%	8.5	5%	RDA
x	Milk and Milk Products	22.9	14%	33.0	20%	28.4	95%	6.6	4%	4.4	3%	90.9	55%	RDA
xi	Meat and poultry	31.7	6%	32.8	7%	31.9	19%	13.9	3%	47.6	10%	249.1	50%	RDA
xii	Fish and trouts	5.0	5%	5.1	5%	2.5	13%	1.7	2%	9.2	9%	5.5	6%	RDA
xiv	Traditional food	99.0	99%	120.3	120%	86.7	87%	46.3	46%	30.7	31%	120.0	120%	RDA
12	Nutrient Analysis													
A	Nutrient intake PLA													
i	Net Energy Kcal/d	1422.1	48%	1319.5	44%	1056.2	36%	1163.9	39%	680.7	23%	1128.5	38%	RDA
ii	Protein g/d	25.7	38%	24.0	36%	19.2	29%	20.1	30%	11.8	18%	20.2	30%	RDA
iii	Visible Fat g/day	42.2	131%	40.6	126%	32.5	101%	31.5	98%	18.3	57%	33.0	103%	RDA
iv	Calcium mg/d	202.0	30%	224.6	34%	179.6	27%	100.8	15%	94.6	14%	160.3	24%	RDA
v	Iron mg/d	5.6	24%	4.6	20%	4.0	17%	4.5	20%	2.7	12%	4.3	19%	RDA
vi	Retinol	240.6	40%	72.7	12%	80.1	13%	79.7	13%	44.9	7%	103.6	17%	RDA
vii	Ascorbic acid mg/d	13.5	34%	11.7	29%	12.4	31%	12.1	30%	9.9	25%	11.9	30%	RDA
viii	Zinc mg/d	3.4	33%	2.8	28%	2.5	24%	3.1	30%	1.5	15%	2.7	26%	RDA
B	Nutrient intake Infant													
i	Energy (kcal)	1719.6	162%	1069.8	101%	1423.6	134%	1012.3	96%	1062.5	100%	1257.6	119%	RDA
ii	Protein (gm)	26.1	156%	18.8	113%	19.8	118%	13.5	81%	20.9	125%	19.8	119%	RDA
iii	Total Fat (gm)	101.7	377%	63.4	235%	87.3	323%	61.2	226%	62.8	233%	75.3	279%	RDA
iv	Calcium (mg)	237.9	40%	193.8	32%	117.7	20%	114.0	19%	155.0	26%	163.7	27%	RDA
v	Iron (Fe) (mg)	2.5	27%	2.6	29%	1.4	16%	1.0	12%	2.6	29%	2.0	23%	RDA
vi	Vitamin A (mcg)	211.5	53%	258.4	65%	81.0	20%	96.9	24%	212.6	53%	172.1	43%	RDA
vii	Vitamin B12 (mcg)	0.8	169%	0.5	93%	0.6	120%	0.5	91%	0.5	103%	0.6	115%	RDA
viii	Vitamin C (mg)	9.6	24%	9.7	24%	4.2	11%	4.1	10%	7.7	19%	7.1	18%	RDA
ix	Zinc (Zn) (mg)	0.8	16%	0.7	13%	0.5	10%	0.4	8%	0.6	12%	0.6	12%	RDA

A. SECTION ONE - GENERAL INTRODUCTION

1. Chapter One – Introduction

1.1. Food insecurity and Malnutrition

The increasing poverty, food insecurity, has caused the world to face malnutrition with its varied forms encompassing deficiencies or excesses of macro and micronutrients further inducing disorders affecting more than 2 billion people across the world and are more prevailing in developing countries like India. Global hunger Index, 2016, ranks India at 97 amongst 118 countries, wherein vitamins and mineral deficiencies continue to be throbbing problems and are budding as quiet crisis. Consumption of daily needs of iron, folate, Vitamin A and B complex, and zinc across any age group is merely 50 percent by more than half the population of the country. Despite of various supplementation programmes, the score is comparatively low when it comes to trim down and address the crucial nutrient deficiencies like iron folic acid and vitamins. Iron deficiency is widespread across all the age groups affecting the hemoglobin level and has become the root cause for anemia in India.

1.1.1. Scenario of Nutritional Status of India

-As stated by WHO (2009), more than one fourth of the world's Vitamin A deficient children suffering from subclinical Vitamin A deficiency belong to India. Global Nutrition report states that the condition of wasting is critical in India¹. NFHS-4 says that in India, 58.4 percent of children in the ages of 6 to 59 months are anemic, 38.4 % are stunted 35.7% of all the children are under-weight and 21.0% are wasted².

The Global Nutrition report further highlights that, globally, 614 million women aged 15–49 years are affected by anaemia. India had the largest number of women impacted (53% of women in the reproductive age against 22.7% of men. With a striking rate of 130 MMR, 34 IMR and 30 Under5 Mortality rate, India is still striving hard to regain its nutritional equilibrium

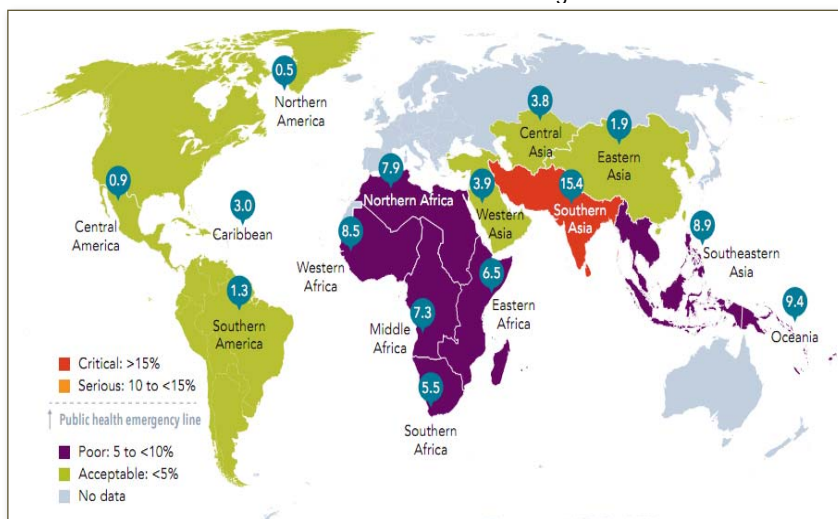


Figure 1.1 : Condition of Wasting across the globe

1.1.2. Scenario of Nutritional Status of Madhya Pradesh

With a total population of 8.70 crores spread across 52 districts³, the Madhya Pradesh state reflects no different condition than the entire country. The state of Madhya Pradesh (MP) endowed with rich natural, human capital reels under poverty, and backward tag despite numerous attractive features, MP, the state of Central India, has not done much improvement in its health and nutrition indicators. With 42% children under 5 years of children stunted and Infant Mortality Rate (IMR) as high as 51 MP continues to be one of the bottom five states of the country⁴.

The data from NFHS-IV reveals that 40% children are wasted, 42.8% of children below 5 are underweight and 25.8% children are stunted. The data further indicates 68.9 percent children are suffered from anemia against 52.4 percent of women belonging to reproductive age group whereas, 54.6 percent pregnant women and 25.5 percent of men are anemic.⁵

1 Global Nutrition Report, 2016

2 Government of India, Ministry of Health and family Welfare, National Family Health Survey-4. 2015-16

3 Census, 2011, http://censusindia.gov.in/2011-prov-results/data_files/mp/Final%20Data%20Sheet_mp.pdf

4 National Family Health Survey IV

5 Government of India, Ministry of Health and family Welfare, National Family Health Survey-4. 2015-16

Anaemia poses a major threat to maternal and child survival and is indirectly responsible for a high Maternal Mortality Ratio (221/lakh live birth)⁶, Infant Mortality Rate (47/1000 live birth)⁷ and lived with disabilities for both sexes in the disease burden of the state. It was rated as number 6 (in 2016) compared with number 12 (in 1990)⁸ and Under 5 Mortality Rate (40/1000 live births)⁹. Iron deficiency anemia is rated among the top 15 causes of years lived with disabilities for both sexes in the disease burden of the state. It was rated as number 6 (in 2016) compared with number 12 (in 1990)¹⁰.

Table 1.1: Health Indicators in Madhya Pradesh

Health indicators in Madhya Pradesh				
SN	Indicators	India	MP	Source
1	Children under 5 years who are stunted (height-for-age)	38.4	42.0	NFHS-IV
2	Children under 5 years who are wasted (weight-for-height)	21.0	25.8	NFHS-IV
3	Children under 5 years who are underweight (weight-for-age)	35.7	42.8	NFHS-IV
4	Infant Mortality Rate	34	47.0	SRS 2016
5	Maternal Mortality Rate	130	173.0	SRS 2016
6	Under 5 Mortality Rate	30	40.0	SRS 2016

At any given point of time, malnutrition is worse and has its own adverse implication on human body and the results are even shocking when it comes to tribal population as they devoid of consuming nutritious rich in particular.

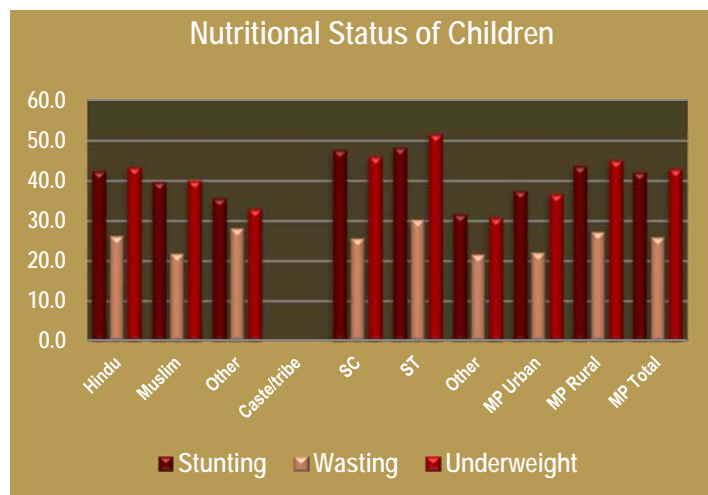


Figure 1.2 : Nutritional status of U5 years of all communities, NFHS 4

6 Office of the Registrar Government of India, NITI Aayog, 2015

7 Government of India, Government of India, NITI Aayog, 2015

8 India Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation. India: Health of the Nation's States.-The India State-level Disease Burden Initiative. New Delhi, India. ICMR, PHFI and IHME, 2017.

9 Government of India, NITI Aayog, 2015

10 India Council of Medical Research, Public Health Foundation of India, and Institute for Health Metrics and Evaluation. India: Health of the Nation's States.-The India State-level Disease Burden Initiative. New Delhi, India. ICMR, PHFI and IHME, 2017.

1.2. Malnutrition and Tribes

If malnutrition is stated to be one of the most stagnating and adverse conditions affecting the health of people of India, then it is also creating a spectrum of diseases, more across all the tribal belts of the country. It is amongst these communities, individuals have shown up the direst health fallouts.

1.2.1. Nutritional status in Tribal

Figure 1.1 shows us that malnutrition in all of its varied aspect is anytime more in Scheduled tribes and Scheduled Caste than any other community.

For instance, approximately 51.5 % of children below 5 years of age in ST communities are underweight as compared to 42.5 % Madhya Pradesh and 38.4% of India (Table 1.2). With similar fashion children below 5 years of age in ST communities continue to lag behind in height-for-age (Stunting) and weight-for-height (wasting) with 47.6% and 25.5 % as compared to Madhya Pradesh 42% and 25 % respectively.

1.2.2. Understanding Tribal Swathe

"Indigenous" is an umbrella term encompassing hunter-gatherers, nomads, peasants, hill people, etc. and has been the universally interchangeable expression intended for tribes, adivasi, janjati, first people/nation, aboriginals, and ethnic groups. As per United Nation, there are more than 370 million indigenous people wide-reaching 72 countries, adding up to, above 5000 distinctive tribes.¹¹ While this figure, equates to approximate 6.0 %¹² of total world's population (7.22 billion¹³); India identifies, 10.43 crore, constituting 8.6 % of its total population as "Scheduled Tribes"¹⁴ that is computed to be 26.07% of world's total tribal/indigenous population.

"All the tribes tell the same story. They are surrounded on all sides, the game is destroyed or driven away; they are left to starve, and there remains but one thing for them to do - fight while they can."
-George C.

1.2.3. Schedule Tribes and its distribution in India

The "tribals" (Adivasi) are India's original indigenous people; termed as "Scheduled Tribes" and is defined as "such tribes or tribal communities or parts of or groups within such tribes or tribal communities as are deemed under Article 342 to be Scheduled Tribes for the purposes of this constitution"¹⁵, as per the Article 366 (25) in the Constitution of India.

11 Indigenous people fact sheet United Nation

12 <http://www.iwgia.org/regions/asia/india> Last Assessed 15/1/2015

13 United States Census Bureau population clock. According to the estimate by the United Nations, world population exceeded 7 billion in October 2011. Last Assessed 15/1/2015

14 Annual Report 2013-14, Ministry of Tribal Affairs

15 <http://www.tribal.nic.in/Content/IntroductionScheduledTribes.aspx> Last Assessed 17/1/2015

As per the census, 90% (89.97%) of total tribal population of India (8.6%) inhabits in rural areas¹⁶. Largely the Scheduled Tribes are populated in two divergent geographical areas – Central Indian States covering more than half of their populace in Madhya Pradesh (14.69%), Chhattisgarh (7.5%), Jharkhand (8.29%), Andhra Pradesh (5.7%), Maharashtra (10.08%), Orissa (9.2%), Gujarat (8.55%) and Rajasthan (8.86%) and the North East (Assam, Nagaland, Mizoram, Manipur, Meghalaya, Tripura, Sikkim and Arunachal Pradesh)¹⁶.

At the same time as, over two-third of the ST population is dwelled in the seven states of the country viz. Madhya Pradesh, Maharashtra, Orissa, Gujarat, Rajasthan, Jharkhand and Chhattisgarh no Scheduled Tribe is notified in 3 States (Delhi NCR, Punjab and Haryana) and 2 UTs (Puducherry and Chandigarh).¹⁷ As per the census 2011, there are 43 recognized Scheduled Tribes in Madhya Pradesh^{18,19} and the total population of STs is 21.1% (15316784) of the total state population (72626809).^{20,21} As per census 2011 preceding Gond, Kol, Korku, Sahariya, Baiga, Paliha, Saur, Pardhan, Mawasi consequently constituting the major tribal groups in Madhya Pradesh.

1.2.4. Implications of Tribal Nutrition

Malnutrition has dire implications: Those not only perpetuates poverty, but also have a inimical repercussions on human development right from birth to the full attainment of growth.

It opens the risk of diseases and death manifolds thus making the malnourished children more susceptible and vulnerable. Even the mothers those who have not attained the nutritional status tend to give birth to undernourished child which further accentuate the condition. Additionally, they are on receiving side of diseases and risks of dying during childbirth. The reduced resistance towards illness make them prone to die (UNICEF, 1998).

Furtherance, such children have more difficult time in learning at schools and even show lower performance while reaching adulthood, due to slower cognitive development (Victoria, et al., 2008).

Maesham and Chatterjee, 1999 stated that, poor nutritional status diminishes returns on investment in education and consequently hampers both economic as well as social development. For the twos, the individual

and the society, malnutrition leads to distressing economic costs; wherein the individuals earn 10 percent less over a lifetime and the world economy loses 2-3 percent of Gross Domestic Product (GDP) due to malnutrition annually²²

Box 1: What does Malnutrition Mean and how is it Measured?

As previously described, under nutrition is a broad term that refers to the outcome of inadequate intake of food (calories) or essential micronutrients that the body needs to grow, resist infection and disease, learn, perform physical work, and complete other essential bodily functions.

Health and nutrition studies typically describe malnutrition in children under five years of age using the following indicators:

- **Stunted** describes children with height measurements that are two standard deviations below the mean of the World Health Organization (WHO) Child Growth Standards median. "Stunted" can be interpreted to be an indicator of the cumulative effects of malnutrition and infection in utero and after birth. Stunting increases the likelihood of illness and poor health, reduces cognitive development, and lowers economic productivity. Women of small stature are more likely to give birth to babies with low birth weight;
- **Wasted** describes children with weight measurements that are two standard deviations below the WHO Standards median. Since weight can change more quickly than height, wasting can be an indicator of both acute short-term reduction of food intake and stunting;
- **Underweight** describes children below two standard deviations from the median in the WHO Child Growth Standards. This is a difficult indicator to interpret, as it can reflect both wasting and stunting; and
- **Low birth weight** describes babies that are less than 2,500 grams (5.5 pounds), and indicates premature birth or restricted growth in the womb, usually due to malnutrition, ill health, hard work or overall poor care of the mother during pregnancy.

Under nutrition in Adults:

- **Underweight or thinness** describes adults who have a body mass index (weight divided by height squared) of less than 18.5. Mothers who are excessively thin are more likely to give birth to babies with low birth weight or those that suffer other complications during pregnancy and child birth.

Micronutrient deficiencies for both children and adults can refer to inadequate levels of a number of critical vitamins and minerals. The following are commonly-observed deficiencies:

- **Anemia** describes a condition in which mothers or children under the age of five have hemoglobin concentrations in their blood below 110 grams/liter at sea level. While anemia indicates an iron deficiency, it can also imply insufficient levels of folate, vitamin B12 and vitamin A. Anemia increases the risk of maternal and child mortality, reduces work capacity, and reduces physical and cognitive development;
- **Vitamin A deficiency** refers to a blood concentration of vitamin A in adults and children which is less than 0.7 micro-mols per liter. The deficiency causes night-blindness (blindness in low light conditions) or, in severe forms, complete blindness. It can also reduce the ability to resist infections; and
- **Iodine deficiency** refers to the condition of having a blood concentration of 100 micrograms of iodine per liter in urine. This deficiency has significant implications for a child's mental development and survival.

Source: WHO, 2010

Box 1.1 : Understanding Terms

16 statistical profiles of scheduled tribes in india 2013 ministry of tribal affairs statistics division

17 annual report 2013-14, ministry of tribal affairs

18 <http://tribal.nic.in/content/list%20of%20scheduled%20tribes%20in%20india.aspx> last assessed 17/1/2015

19 <http://tribal.nic.in/writereaddata/userfiles/file/section%20table/section1table.pdf> last assessed 17/1/2015

20 demographic status of scheduled tribe population of india last assessed 17/1/2015

21 <http://tribal.nic.in/writereaddata/userfiles/file/section%20table/section1table.pdf> last assessed 17/1/2015

22 World Bank. 2006. "Repositioning Nutrition as Central to Development. Washington, D.C.: World Bank.

2. Chapter Two: Approach to combat Malnutrition

2.1. Approach to improve nutritional status and behaviors

Consumption of micronutrients may prevent micronutrient deficiencies and even can eliminate it, further ameliorate the nutritional status. Different strategies to tackle micronutrient deficiencies are supplementation of micronutrients to targeted populations, dietary diversification, nutrition education, along with other public health measures including WASH programmes, deworming, support to breastfeeding, and vaccination programmes. Over the past few years, government of India has already invested into number of programmes to expand the coverage and enhance the nutrition security situation with a special focus to improve current micronutrient deficiencies. However, all approaches fall of tracks rooting dearth of programs that targets in fulfilling the longing nutritional needs of the vulnerable groups and masses.

2.1.1. Scheme plan at ground/ community level

The box plan below suggests the schematic idea to be established at village or community level in order to bring change at vertical extent. This box plan is adopted from five ideas for triple duty actions to advance progress across the SDGs as indicated in global nutrition report¹

Consequently, the basic idea lies in setting up the coveted plan at the village level itself, with and within the community by strengthening up their traditional food system thus earmarking the basics of life at the initial stage, where life begins and thus focusing on adolescent, pregnant and lactating mothers and under two children with the resources available to any community at given point of time.

2.1.2. Global Nutrition Targets and achieving SDGs

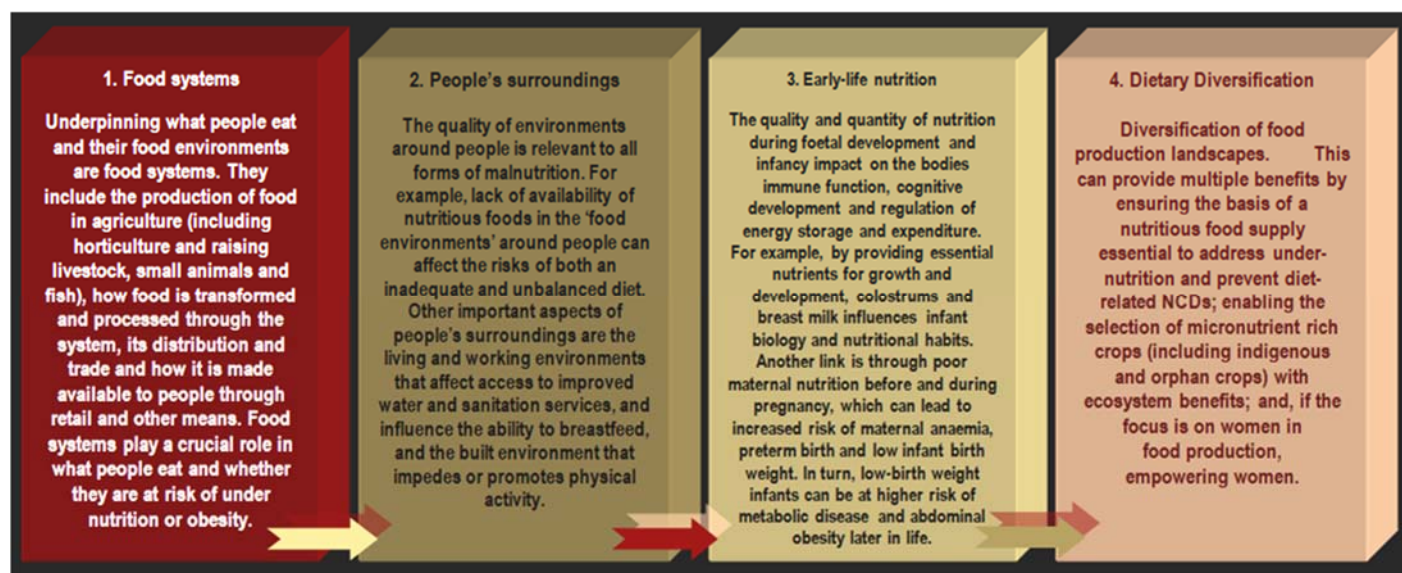
Alleviating malnutrition and bettering up the nutritional status, is a step towards achieving SDG 2.0 i.e. zeros hunger. The global nutrition targets as adopted by WHO laid emphasis on MIYCN, diminishing all forms of malnutrition including stunting wasting and reducing one third of premature mortality (As shown in Box 1, 2 and 3 respectively of Annexure I)

Therefore, there is a calamitous emergency to assess the resources, the community is rich of.

Box 2: Government Policies

Gol's response to the high burden of tribal malnutrition spans a range of policies and interventions that have produced mixed results. Some approaches have focused primarily on the matter of food security, such as the PDS, the Mid-day Meal Scheme (MDMS), and National Food Security Act (NFSA). Other approaches target health and nutrition issues, such as the Integrated Child Development Scheme (ICDS), National Rural Health Mission (NRHM), and Rajiv Gandhi Scheme for Empowerment of Adolescent Girls (RGSEAG), also called the SABLA scheme, which focus specifically on the nutrition and economic empowerment of adolescent girls. Gol has also sought to address malnutrition by exploring the issue through a number of other sectors, including water supply and sanitation, political and economic development, and land management. For instance, the Nirmal Bharat Abhiyan or NBA (Total Sanitation Campaign (TSC)) has sought to reduce malnutrition in the water supply and sanitation sector. With regard to political and economic development, the Panchayats (Extension to Scheduled Areas) Act of 1996 (PESA) extended local government structures to tribal areas or the Tribal Sub-plan (TSP). Key modifications to the Land Acquisition Act (LAA) and Forest Rights Act (FRA) have improved access to essential resources such as land and forests in tribal regions. Despite these efforts, as indicated previously by the nutrition outcomes in Figure 1.2., progress to mitigate malnutrition has been slow at best, if not entirely elusive. Thus there is a dire need to switch to systematic approach rather than those which are already in action because the slow pace of progress is strongly linked to deficiencies in policy and program design or, more often, service delivery issues in tribal areas.

Box 2.1: Government into Actions



Box 2.2 : Systematic Box approach encompassing Food systems and People's Surrounding to be polished to have better Early Life Nutrition and Dietary Diversification

Chapter Three – Community Nutrition and Traditional Food Resource Mapping Study

3.1. Understanding traditional/local food system

Understanding the food systems of community, in a way to improvise and strengthen them in the milieu of nutrition and health facade inimitable challenges. Numerous studies have established the fact that local and traditional foods, along with dietary diversification within a community ecosystem can turn it into voracious source of nutrients and consequently lead to better health. Any community at given time is diverse from other in view of their food and behavior practices, dietary habits, habitat, social assemble, which altogether determines their food consumption pattern. These food patterns are influenced by environmental constraints which further can lead to extreme scarcity of food in lean seasons to even high availability and intake of seasonal foods during harvest and post-harvest periods. The tradition persists in the community affects the food related practices at large. For that reason, comprehending the diversity of local food system, the constraints, augments, the limitations, which further adds in extemporizing these systems as a whole in view of health and nutrition, is the need of hour.

There is no accepted definition for “local food”. As adopted by US congress in 2008 Farm Act (Food, Conservation and Energy Act), *the total distance that a product can be transported and still be considered a “locally or regionally produced agricultural food product” is less than 400 miles from its origin, or within the State in which it is produced, is said to have been a local produce or food*²³.

3.2. Community Nutrition and Food Resource Mapping

Community nutrition and food resources mapping study is a unique type of community assessment. It includes the collection of information targeting the ability of current and existing community food resources, those are rich in nutrition and micronutrients to offer adequate and nutritionally packed amounts of the foods those are culturally acceptable to households in the community. This mapping study/assessment would help in developing the community profile that further will show up the positive as well as negative elements and factors required to assure household's nutrition and food needs.

As per Community Food Security Coalition, it involves assessment that includes data, facts and details on food access, nutrition access, locally available food and

micronutrient contents, its availability factors during hunger, inventory of traditional foods and resources and thus helps in building policy perspective²⁴. This inventory further helps community to use their specific own food assets through a systematic methods by identifying the resources, needs and problems to address any nutritional challenge

Box 3 : Understanding the theme: “Community is food resource rich: A fact or sheer Imagination!”

With this idea, this study would focus to corroborate the facts and myths associated with the resources available within the community, whether are enough to swathe the additional nutritional demands in biologically designed physiological changes as observed in vulnerable groups including women of reproductive age (15 to 49 years), pregnant and lactating mothers, adolescent and young children (6 months to 2 year). As these special cases have raised burden of growth and development and so does the dietetic needs grow. Thus justifying the Para-limits of resources within community are sufficient enough to offer the desired micronutrients or be in want of a seek-out to other micronutrient rich resources out of the well.

23 Local Food Systems, concepts, impacts and issues by Steve M. et al

24 (H. Joseph, ed. Community Food Security: A Guide to Concept, Design, and Implementation, 1997).

4. Chapter Four – Research and Methodology

4.1. Problem Statement

Globally community is advancing towards seeking maintainable means of nutrition even more for the growing population and special and vulnerable groups across all the boundaries. The stress is on diagnosing low-income resource strategies good enough for the communities that should not be pressing extra burdens on the environment²⁵. One optional advent could be embracing an ecosystem approach in farming and rural management with an importance on traditional and native coping strategies.

Petite and trivial families in rural areas in India countenance a divergent shift in food and nutritional practices. Current food habits are by and large related with Public Distribution System, cultivation and other agriculture surroundings in the vicinity and market driven forces. With the advent of Green Revolution in India, wheat turned out to be a major staple food on small and marginal families' plate. Earlier the nutrition transition, local grains and millets including *maize, bajra, kodo, kutki, bavta, kang, barley, brown rice*, were obtained for conventional meals and recipes as a common practice in traditional cooking.

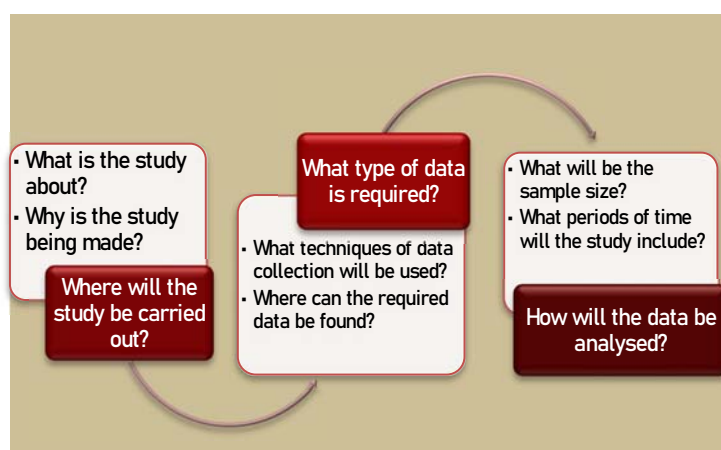


Figure 4.1: Research Methodology adopted

There is an acute need to re-introduce these carbohydrate-rich grains and lost millets with high nutrient density back into food system and making them culturally adaptable, acceptable, and conventional. This discreet step would trim down burden on under-nutrition in this segment of

population. Thus, it becomes important to understand the food systems of indigenous people, who keep hold of association to long-evolved civilizations and blueprints of living in local ecosystems.

Multifarious of traditional foods resources including both from plant as well as animals have been documented to have been rich with high food, nutrition and medicinal value. Howbeit, the nutrient contents of these food resources is still a missing link and are under documented respite of several studies on food systems in various parts of India focusing on traditional food system

Thus, the present study is undertaken in the larger context to revive back the nutrition sensitive agriculture and food system to propose the policy idea to be adopted for the community emphasizing on use of locally/traditional food.

It involves documenting and mapping traditional food resources, with its identification and taxonomic classification (if required), followed by nutrient composition analysis, nutritive value, consumption pattern by population and vulnerable groups including IPLA (Infant, Pregnant and Lactating mothers and Adolescents) and elders, existing and traditional diets, comparison with RDA, missing links and revisionary plan for policies.

4.2. Objective of the Study

The word “community” is the key to the process. This study is a process led and implemented within the community and involves people to achieve a community goal. The main aim is to make the community gain from the information collected.

The objectives is to gather relevant pieces of information to identify gaps and needs in the community and analyzing the services, resources and systems that can be further utilized to fulfill those gaps and meeting the nutritional requirement. This would help in understanding –

4. Status of community people
5. Availability of community traditional food resources
6. Capacity of the available resources

Through capturing the community knowledge through adapted participatory ways of learning and action, this study broadly aims to bring out the nutritional strength of the food system so as to fetch the nutrition transition in the community to fight under-nutrition.

²⁵ Food and Agriculture Organization 1993

The broader goals are –

4.2.1. Targeting early life nutrition with this study

As concluded from various studies on indigenous traditional food system, early nutrition plays crucial role in determining the nutritional status of any individual and further to the group of population as a whole. It is well documented, that children belonging to these communities are at higher risk of micronutrient deficiencies including vitamin A and D disorders and iron-deficiency anaemia. Moreover, women of most rural settings are deprived of micronutrients like, zinc, vitamin B12, and iron amount to the primary micronutrient deficiencies amongst them²⁶. Thus prolonged insufficient intake of vitamins and minerals leads to chronic micronutrient deficiency often referred as “hidden hunger”

Dietary assessment done on Bhil Traditional food documenting 94 foods includes diversity of plants, animals, local fishes showed the percentage of energy from local cultivated and wild indigenous foods was 68 percent for children 59 percent for women.²⁷ A particular point of concern is that although drumstick and fenugreek leaves have high carotene content and are readily available in the community, only 1 percent of the study group consumed them. In fact, several micronutrient-rich traditional foods were infrequently consumed.

The dietary energy and protein intakes of most pregnant women and pre-school children did not meet Indian Recommended Dietary Allowances. Women and children were short in stature with low body weights, consistent with malnutrition, according to National Centre for Health Statistics standards. A directory of Bhil foods has been developed in collaboration with the community. Improvement of food security, nutrition and health with implications for community-friendly policies and programmes are expected to be direct outcomes of the study.

4.2.2. Targeting dietary diversification

Dietary diversification is a verified cost-effective strategy to improve malnutrition. The loss of nutritional diversity has many ramifications on the health of rural people that further exacerbate their economic condition and decreased consumption of diverse foods. The numerous advantages of promotion and preservation and promotion of indigenous foods range from a collateral endorsement on biodiversity and ecological sustainability to improving micronutrient intakes. A high prevalence of chronic energy deficiency and under-nutrition along with micronutrient deficiency among

tribal populations is well documented. The tribal communities in India set best examples for indigenous group with a gigantic cultural diversity, traditions, and environments.²⁸

Their rich habitats of natural food could possibly be used for promoting food security, nutrition, and health. However, compound aspects including topography, available agricultural technology, socio-cultural practices, and conditions in the community results in poor nutrition and health in these communities.²⁹

Thus, the present study will be carried out to document the local/traditional food and nutrition system of community within their rural settings in respect to their socio-cultural system and thus proposes –

- To understand the various dimensions of food system and its inter-linkages with the past and present traditional system.
- To gain a better understanding of the functioning of lands and their interrelation with the availability and quality of food.
- To identify the alternatives, promoting the traditional food systems, problems and associated factors
- To understand and identify the factors influencing food systems and
- To understand the determinants of food consumption pattern
- To understand the food culture, habits, tradition and practices of selected community
- To analyze the importance of locally available food and their claims
- To understand and read the dietary texture and composition of the given field
- To compare the diet and food patterns between different selected study areas

Tribal people are amongst the most marginalized population groups and thence experience extreme levels of health deprivation in respect to women and child health and nutritional status. There are not many records and studies rooting dearth of information concerning to the health and nutritional status amongst women in tribal populations. Known to the fact that every twelfth woman in India belongs to the tribal community³⁰, improving their health status turns out to be the major concern. Furtherance, the study aims –

- To understand the patterns of tribal health deprivation

26 Mallikharjuna RK, Balakrishna N, Arlappa N, Laxmaiah A, Brahmam GM. Diet and nutritional status of women in India. *J Human Ecol.* 2010;29:154

27 The Bhil study undertaken in collaboration with Child Eye Care Charitable Trust is part of 12 case studies addressing a commitment to research into areas of nutrition and health

28 International Fund for Agricultural Development 2003; Singh, Singh, and Sureja 2007.

29 (Bhattacharjee et al. 2009)

30 Demographic Status of Scheduled Tribe Population of India

- To look for the unfavorable condition of tribal women and children amongst these tribes, in terms of health and nutritional status.
- To investigate the practices and customs adopted in providing rich and nutritious food during pregnancy, first months of child birth, lactation, and adolescence period.
- To calculate the nutritive value and comparison of dietary intake by special groups, further comparison with Recommended Dietary Allowance of Indians as proposed by Indian Council of Medical Research

4.3. Limitation of the study:

The research had some difficulties in getting support by tribal during collection of the data in terms of delving proper information to unknowns. The fear of expressing the right information to the outsiders was overcome by rapport building exercise which was a time consuming process. In addition, other efforts were made to collect extra information apart from the questionnaire, in reference to have interviews of individual or group on pre-tested tools.

The study has some limitations such as-

- Data collected is based on tribal's information regarding consumption of food, availability of traditional foods, use of wild cultivation and NTFPs, which varied individual to individual and community to community even on similar notions. This could lead to data imprecision. Researcher crosschecked the data to make it reliable and precise.
- The study cannot be oversimplified and implied for other locations because of its pertinence to a particular location especially to tribal confined zones which has drastic difference than any other community belonging to same village or hamlet
- The study focused on the availability of traditional food, in particular and their consumption and storage pattern, which is however is influenced by the seasonal impact. The same set of data could be different for different seasons.
- The time constraint was the important indicator in determining the precision of the research.
- Availability of village folks at the time of study was another challenge, making the researcher teams to visit the households in person, brining another time boundation.
- The individual's accuracy in recalling or recording their consumption and estimating portion sizes;
- The comprehensiveness of the food composition tables to capture all foods available for the study;
- Understanding that respondents are prone to over-reporting low intakes and under-reporting high

intakes. This pattern is referred to as 'flat slope syndrome' (Baranowski, 2013).

4.4. Study Area:

This study was consumed as a step ahead to "study on 1000 days cycle of child" that concluded on carrying out a full-fledged intensive research on the availability and use of the local foods, vegetables and fruits across the villages in the project districts(Panna, Satna, Rewa and Umaria). So that, it could appropriate food, fruit and vegetable groups keeping the needs for energy intake as well as that of the essential micronutrients as part of essential diet plan, both for the women of the reproductive age-group of 15 to 49 years, pregnant women, lactating mothers and children upto 2 years.

Thus the proposed geography for the present study was conducted in five districts of Madhya Pradesh namely -

6. Umaria (Baghelkhand region)
7. Satna (Baghelkhand region)
8. Rewa (Baghelkhand region)
9. Panna (Bundelkhand region) and
10. Niwari (Bundelkhand region)

4.5. Methods employed

The study design is adapted from the manual of international case studies to be documented for traditional foods systems of indigenous people. Table 4.1 broadly explains the type of data which was required to be collected and the segments on how and what ways the data were to be collected.

4.5.1. Study Tools

As this study embraces larger research on traditional food, its availability and consumption pattern with special focus on dietary intakes of individual belonging to vulnerable group, it aims to square the proper information documented through in-depth interviews, Focused Group Discussions (FGDs), dialogues, and personal observation. Leading pragmatic data were collected using household questionnaires.

4.5.1.1. Household Questionnaire

A pre-tested questionnaire were administered in 10 villages chosen for study covering 250 households in total to gather socio-economic data on family size, family type, social group, source and ways of income, expenditures, agriculture and livestock, Featured questions on some of the broadly selected component were targeted to get the detailed information on extraction and utilization of wild and conventional food products, food consumption patterns, determinants of food security, health and wash practices, consumption and processing of NTFPs, besides focusing on other information to get a peek through on a situation.

4.5.1.2. Focused Group Discussions (FGDs):

Focused Group Discussions was performed with a group of twenty to twenty-five members of the villages. It aimed to call one representative each of different hamlets as much as possible pertaining to the conditions. The researcher team tried to engage mixed group including women, men of different age groups, and different social classes together for the FGDs to have proper information on the subject.

4.5.1.3. In-depth interviews

In-depth interviews were planned to be asked from the key informants in order to provide the precision to the research and to have a clear picture of the localities. These key informants were selected from the community mobilizers, including AWW, sahayika, ASHA, ANM, Teachers, Sarpanch Employment Secretary, Panch etc. Five key informants from each villages were selected.

4.5.1.4. Dietary Recall Questionnaire

A detailed 24-hours recall questionnaire was administered to all pregnant, lactating, adolescent, and mothers of children below 2 years of age.

4.5.2. Study Technique

4.5.2.1. Participatory Rapid Assessment (PRA)

These methods were used to elude the information on commonly consumed local/traditional foods. Focus group discussions (FGDs) were conducted to assess the range of available foods and the contribution of indigenous wild foods to the regular diets of the relative tribal community. The female AWWs, community health workers or sahayikas in the respective villages were requested to invite community members to participate in the FGDs ahead of the field visits.

The participants included women with children, adult men, and the elderly (men and women). Mothers were especially encouraged to attend because they were mainly responsible for food preparation and feeding their families.

The FGDs were held in accessible areas such as the Anganwadi centers, Panchayat Bhawan or in front of the homes of the AWWs or sahayikas. During the FGDs, a discussion guide was used by the study team to steer the conversation toward the participants' knowledge of food groups, their conservation and consumption patterns, wild cultivation and its importance, crops those are at the verge of being extinct.

All participants were informed that the FGDs were going to be recorded and that no personal information would be used in any of the study reports. Permission was taken for pictures to be taken during the FGDs.

The local field team was provided with the copies of transcribed and translated information sheets. the

discussions to Hindi or English. Personal or identifiable information was not recorded in any reports. The aforementioned description of the study thus adhered to the RATS guidelines for reporting qualitative studies.

During the PRA exercise the following methods were adopted:

1. The FGD included a free listing exercise to identify indigenous foods consumed in the community and develop a list of such food items.
2. The participants were then asked to identify indigenous or *desi* foods gathered from the local environment such as nearby forests (jungle), fields, agricultural fields, gardens (*bari* or kitchen garden), or water resources such as man-made ponds, creeks, or dams or even those bought from the weekly markets (*haat*).
3. The local names of plants or meat items and their characteristics such as availability, seasonality, and source were documented.
4. The foods identified were then categorized under various food groups based on their edible parts.
5. Ethnographic manuscripts on the tribal populations in the area were also used to confirm the list of common foods.

4.5.2.2. Pair wise ranking:

Pair wise ranking was used to identify perceptions, priority setting, and preferences for local food items. After the free listing exercise, the FGD participants were asked to identify 5 to 6 preferred food items for traditional foods available seasonally and locally especially those are consumed as larger part of diet; for example, green leafy vegetables (GLVs), cereals, vegetables, etc. These preferences were based on criteria of taste and availability of particular food items.

These were then ranked. This helped in identifying the popular and commonly consumed indigenous foods under different food groups. The most commonly consumed food items as identified under each food group category were then entered into a matrix on a flip chart. Participants were then asked to compare the first food item in the row with various food items listed in the column one by one. The next step was to ask them to move on to the second food item in the row, keeping that as a constant, and comparing it with the third and the subsequent food items and enter the preference in the relevant grid. The same steps were repeated until all of the food items listed in the row was compared with the subsequent food items listed in the columns pair wise. A score was provided based on the number of times each food item was selected. Using this method, a hierarchy of preferred food items in the various food groups was identified.

4.5.2.3. Identification and Taxonomic classification of Food Samples

Based on the free listing activity done through FGDs, a list of commonly consumed indigenous food items was compiled (including cereals, roots and tubers, legumes/pulses, vegetables, GLVs, seeds, fruits, and animal foods). A literature search was done to identify the taxonomic classification based on the common names provided by the community. The references for taxonomic classification used in the study are –

1. Ainsworth & Bisby's dictionary of the fungi
2. The Cambridge encyclopedia of ornithology
3. Dirr's Hardy trees and shrubs : an illustrated encyclopedia
4. Encyclopedia of birds, entomology, insects
5. Encyclopedia of marine mammals
6. Fishes of the World, 2006
7. Grzimek's animal life encyclopedia
8. The illustrated encyclopedia of trees
9. Biodiversity and taxonomy, 2012
10. Zoological Taxonomy
11. Plant Taxonomy

4.5.2.4. Nutrient Analysis

The nutrient analysis was done according to standard reference protocols. The parameters analyzed for the raw/uncooked samples included energy, carbohydrates, total fat, total carbohydrate, sugar, dietary fiber, vitamin A (as beta carotene), thiamine (vitamin B1), riboflavin (vitamin B2), niacin (vitamin B3), vitamin C, calcium, iron, zinc, sodium, and folic acid. The analyzed values were reported per 100 g of edible weight using references of Indian food's nutritive values as provided by National Institute of Nutrition, Indian Council of Medical Research. The two references used in specific are –

- A. Nutritive Value of Indian Food by C. Gopalan, NIN
- B. Indian Food Composition Table, 2017, ICMR

Box 4 : The Indian Food Composition Tables

The Indian Food Composition Tables, 2017 provides nutritional information on 151 discrete food components for 528 key foods. Each food was compositely sampled from six different regions covering the entire country thus representing the national food supply and consumption pattern. The nutrient mean of six regions represents the national value, and SD represents the national variability. There are 12 tables providing nutrient data on proximate principles and dietary fibre, water soluble vitamins, fat-soluble vitamins, carotenoids, mineral and trace elements, starch and individual sugars, complete fatty acid profile, amino acid profile, organic acids, polyphenols, oligosaccharides, phytosterols, saponin, phytate and complete fatty acid profile of edible oils and fats. Number of food entries in each food group are: Cereals and millets (24), grain legumes (25), green leafy vegetables (34), other vegetables (78), fruits (68), roots and tubers (19), condiments and spices (33), nuts and oil seeds (21), sugars (2), Mushrooms (4), Miscellaneous foods (2), milk and milk products (4), egg and egg products (15), poultry (19), animal meat (63), marine fish (92), marine shellfish (8), marine mollusks (7), fresh water fish and shell fish (10). Data on vitamin D2, oligosaccharides, phytosterols, organic acids and individual polyphenols are hall mark contribution of the new IFCT 2017.

Box 4.1: About Indian Food Composition Table, 2017

4.5.3. Sample design and Data collection

4.5.3.1. Sampling

4.5.3.1.1. Universe

The universe for this exploratory cross-sectional study was tribal belt that includes 10 villages, two each from 5 districts chosen for study populated both with Scheduled caste and Scheduled tribes mostly with gond, baiga, kol etc.

4.5.3.1.2. Sample selection

These villages were identified using systematic random sampling from the source list. Table 4.2 shows detail list of sample selection

Table 4.1: District Details

Districts	Village Name	Block Name	Panchayat Name	FG Ds	HH	KI	IPL A	Total Sample HHs+ IPLA
Niwadi	Kaina	Niwadi	Kaina	2	25	5	20	50
Niwadi	Pojanpura	Niwadi	Bihayipura	2	25	5	20	50
Panna	Kudar	Panna	Khajri	2	25	5	20	50
Panna	Kotagunja pur	Panna	Jardhova	2	25	5	20	50
Rewa	Obri	Jawa	Baunsar	2	25	5	20	50
Rewa	Gadhwai	Jawa	Sohawal Khurd	2	25	5	20	50
Satna	Devlahya	Majhga va	Devlahya	2	25	5	20	50
Satna	Khairwar	Majhga va	Bhathwa	2	25	5	20	50
Umaria	Mardari	Karteli	Birhuliya	2	25	5	20	50
Umaria	Amdi	Karteli	Amdi	2	25	5	20	50
Total				20	250	50	200	500

4.5.3.1.3. Sampling of HH Questionnaire

The total population of NFI Project area, the study was part of, was 62789 and total households were 13807. With confidence level of 95% and confidence interval of 4.55, the total sample for both IPLA and Households was calculated as 450

The households were further selected using systematic random sampling separately for each village.

Similar fashion was adopted for selecting pregnant mothers, lactating mothers, children below 2 years of age and adolescent girls, as per the data available on the Anganwadi records.

C. SECTION THREE – BACKGROUND OF STUDY AREA

5. Chapter Five – Background of All the 5 districts

5.1. About the geography of study area

As mentioned in the previous chapter, the study area that was chosen for the present study was a part of larger NFI project and it includes 2 districts from Bundelkhand region viz. Niwari and Panna and 3 districts from Baghelkhand Region viz. Rewa, Satna and Umaria. Figure 5.1 illustrates the study area's districts lies in northeastern part of the state.

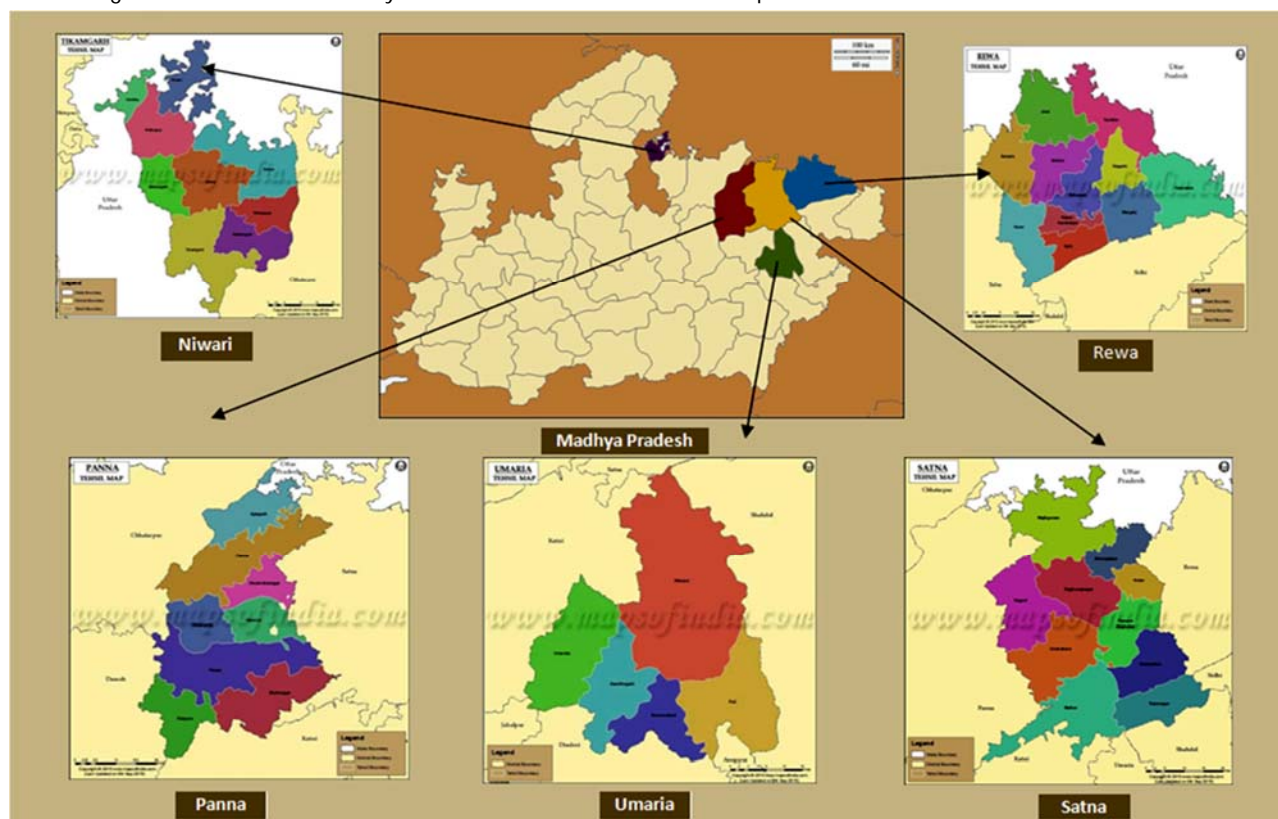


Figure 5.1 : Districts of Study area viz. Niwari, Panna, Rewa, Satna and Umaria of Madhya Pradesh

5.1.1. Location and Geographical area

5.1.1.1. Niwari

Niwari District, which is recently extracted out of Tikamgarh District, is located in the northern part of Madhya Pradesh. It forms the northwestern part of Sagar District. It lies on the Bundelkhand Plateau between the Jamni, a tributary of Betwa and Dhasan rivers. It extends between the latitude 24 degree 26 minute and 25 degree 34 minute N and between 78 degree 26 minute and 79 degree 21 minute Longitudes. The northern margin is very irregular. Towards south is Tikamgarh District which is bounded by Chhatarpur district to east, Lalitpur district Uttar Pradesh to West, Jhansi to North and Sagar to South. The western and Eastern boundaries are formed by two big rivers.

5.1.1.2. Panna

Panna district lies between 23° 45' and 25° 10' north latitudes and 79° 45' and 80° 40' east longitudes. It has an area of 7,135 km². The Ken River flows through the district. The Pandav Falls and the Gatha Falls are located in the district. Panna National Park is a major tourist attraction in the district.

5.1.1.3. Rewa

Rewa is basically a plateau which decreases in height from the south to the north. In the south, the height of Kaimur Range is more than 450 meters, whereas the height of alluvial plain of Teonthor is just 100 meters. In the district, dissected hills, ravines, plain, plateau, scarp, water-fall and alluvial plain can be seen. The rain-water of the district flows out using the two assisting rivers of the Ganges, the Tons or Tamas and the Son. Bichiya River flows through the heart of Rewa city. Rewa lies between 24° 18' and 25° 12' north latitudes and 81° 2' and 82° 18'. The district is bounded on the north by Uttar Pradesh, on the east and southeast by Sidhi, on the south by Shahdol, and on the west by Satna. It is part of Rewa Division. It has an area of 6,240 km²

5.1.1.4. Satna

Satna district is situated in the Vindhyaachal Plateau of Madhya Pradesh State. The district is located in between the Vindhyaachal and Satpura range of hills. The district is having the boundaries of Banda district of Uttar Pradesh State in North, Rewa and Sidhi districts in the east, Panna district in the west and Jabalpur and Umaria districts in the south. The district is located in between 23.58 degree North Latitude to 25.12 degree North Latitude and 80.21 degree East Longitude to 81.23 East Longitude. The District is situated about 305 meters above the mean sea level. The district takes name from Satna, the head quarters town, which is in turn takes it's from Satna River which flows near the town

5.1.1.5. Umaria

Umaria district is located to the North East of Madhya Pradesh. Mathematically the coordinates of the District extend from 23° 38' to 24° 20' North and 80° 28' to 82° 12' east. It has geographical area of 4548 sq.km. The greatest length of the district is about 150 km. from north to south and the greatest width is about 60km from east to west. The population of the district on the basis of 2001 census is 515963. Out of which about 83% population resides in rural areas.

5.1.2. Topography

5.1.2.1. Niwari

The northern part of the district is at a height of 200 meters from the mean sea-level while the southern part is at a height of 300 meters. It lies in the level plane which forms the Betwa-Dhasan Doab. The geology is characterized by what is known as the Bundelkhand Gneiss in geological terms. It is a hard grayish pink granitoid rock of simple composition traversed by conspicuous quartz fields, which form an integral part of this formation. These rocks are found in the forms of sheets and dykes across the district, thus defining the topography of the district. The area is gently sloping from south towards north.

5.1.2.2. Panna

The terrain of the Reserve is characterised by extensive plateaus and gorges. The topography in the Panna district can broadly be divided into three distinct tablelands - the upper Talgaon Plateau, the middle Hinouta Plateau and the Ken valley while there are series of undulating hills and plateaus on the other side of Ken river in the Chhatarpur district.

5.1.2.3. Rewa

Significant waterfalls on the Tamsa or Tons and its tributaries, as they come down from the Rewa Plateau, are: Chachai Falls (127m) on the Bihad River, a tributary of the Tamsa, the Keoti Falls (98m) on the Mahana River, a tributary of the Tamsa, Odda Falls (145m) on the Odda River, a tributary of the Belah River, which is itself a tributary of the Tamsa, and Purwa Falls (70m) on the Tamsa or Tons.

5.1.2.4. Satna

Annual rainfall is about 1200mm and Red Soil, Light Black, Alluvium and Hilly Soils are the predominant soil types available in the district. Rivers are not perennial in nature well, ponds, canals and tube wells are main source of irrigation in the district

5.1.2.5. Umaria

The famous Bandhavgarh National Park (Tala) and Sanjay Gandhi Thermal Power Station Mangthar (Pali) are located in the district.

5.1.3. Forest

5.1.3.1. Niwari

Tikamgarh district has a southern tropical dry deciduous type of forest. About 6% of the total land is covered by forest. Earlier the area comprised dense forests but due to a rising demand for wood and agriculture expansion, the level of deforestation increased. A timber forest lies near Orchha town and around Betwa and Jamuni rivers. The non timber forest of the district consists of Tendu, Seja, Dhawa, Gunja Salai, Mahuwa, Baheda, Palash, Amla, Bel and Bamboo. In the non-timber forest, the medicinal plants have the potential to be a major source of livelihood for the people residing near forest area. But due to the absence of a proper market strategy, the lack of infrastructure for transportation and awareness, this is not possible at present.

5.1.3.2. Panna

Most undisturbed habitat of about 70-80 sq. km. lies on the Hinouta plateau. This is due to relocation of three villages from this area in 1980s. Dry and short grass habitat with open woodland is quite extensive. It supports Blue Bull (nilgai) and chinkara. The areas with tall grasses associated

with woodland, support good densities of sambar and chital. Mesic areas are distributed along the major seasonal streams and in the Ken river valley. Steep slopes of plateaus are drier and are dominated by *Acacia catachu*. Distribution of these habitats creates a heterogeneous landscape, where ecological conditions vary seasonally. Panna Tiger Reserve is most important PA in the north-central highlands of India, as it links the eastern and western populations of wild animals through the NE-SW running Vindhyan ranges.

5.1.3.3. Rewa

Rewa has significant forest spread covering an area of 3072.41 sq meters

5.1.3.4. Satna

All development blocks of the district are having a significant area under forest. Total area of the district 7424 Sq.Km. out of which total forest area in the district is about 2037 Sq. Km. The district is having vast forest wealth, wherein the production of Building Woods, Firewood and valuable Medicinal Plants are produced. Sects of population depend on the forest for their livelihood. More industries can come up on forest based products, which will help to improve the employment generation in the rural areas substantially.

5.1.3.5. Umaria

The district has extensive forests. About 42% of the total area is covered by forests only. The District is rich in minerals. The most important mineral found in the district is coal and as a result 8 mines are being operated by South Eastern Coalfield Limited in the district. Forest covered 76500 Hecters.

5.2. Census 2011-19 Data

5.2.1. Administrative setup

5.2.1.1. Niwari

Niwari is a tehsil/town and a nagar panchayat in Tikamgarh district of Indian state, Madhya Pradesh. It is adjacent to the Jhansi and Mahoba districts of Uttar Pradesh. As of the 2001 Census of India, Niwari had a population of 20,711 with the 606,00 km² area. Males constitute 53% of the population and females 47%. Niwari has an average literacy rate of 60%, higher than the national average of 59.5%: male literacy is 69%, and female literacy is 50%. In Niwari, 7% of the population is under 6 years of age.

5.2.1.2. Panna

Panna is headquarter of revenue division. According to Census 2011, the total number of villages in the district are 1011. Out of which 947 villages are inhabited and 64 villages are un-inhabited. Panna district is divided into eight

tahsils. Tahsil wise number of villages are, Ajaigarh(120),Panna(149),Devendranagar(70),Gunnor(149), Amanganj(114),Pawai(179) ,Shahnagar (121) and Raipura(109) and Five community development blocks in the district, namely; Ajaigarh,Panna,Gunnor,Pawai and Shahnagar. In all the CD blocks headquarters there are 5 Janpad panchayats. The district headquarter is Panna. There are 395 gram panchayats in the district. There are Patwari halka 402 and Revenue village 1015 under revenue administration in the district. There are Six towns in the district. As per urban classification, Panna(M) is municipality, Whereas Ajaigarh(N.P.), Devendranagar(N.P.), Kakarhati(N.P.), Amanganj(N.P.) and Pawai(N.P.) are Nagar Panchayats. The district has one parliamentary constituency i.e. Panna and three assembly constituencies viz. Pawai, Gunnaor and Panna.

5.2.1.3. Rewa

According to Census 2011, the total numbers of villages are 2719, out of which 2408 villages inhabited and 311 uninhabited. Tahsilwise number of villages; Teonthar (294),Jawa (265), Sirmour (188), Mangawan (290), Semariya (183), Hanumana (333), Mauganj (331), Naigarhi (376), Huzur (208), Raipur-karchuliyan (116) and Gurh(135). In the district there are 11 tahsils whereas C.D. blocks are 9, namely Jawa, Teonthar, Sirmour, Gangev, Hanumana, Mauganj, Nai-garhi, Rewa and Raipur-Kaichuliyan. There are 12 towns in the district. As per urban classification Chakghat, Teonthar, Sirmour, Baikunthpur, Mangawan, Semaria, Hanumana, Mauganj, Nai-garhi, Govindgarh and guruh are the Nagar Panchayats, whereas only Rewa is Municipal Council. There are 827 Gram Panchayats and 9 Janpad Panchayats in the district. Under the revenue administration there are 27 Revenue circles and 462 Patwari Halkas.

5.2.1.4. Satna

According to Census 2011, the total number villages in the district are 1984, out of which 1799 are inhabited and 185 villages are un-inhabited. There are 10 tahsils, whereas CD blocks are 8, Majhgawa, Sihawa, Nagod, Unchehara, Rampur-Baghelan, Amarpatan, Ram-nagar and Maihar. Tahsilwise number of villages are Raghurajnagar (264), Nagod (262), Unchehara (235), Rampur-Baghelan (138), Amarpatan (187), Rampur (193), Majhgawan(193), Kotar(87), Birsinghpur (172) and Maihar (253). As per Urban classification, There are 13(11+2CT) towns in the district. Satna (M.corp.), Maihar (M), Chitrakoot, Birsinghpur, Kothi, Jaitwara, Nagod, Unchehara, RampurBaghelan, Kotar and Amerpatan are all the Nagar Panchayat and Madhawgdha), Majhgawan are Census Town. In all the CD blocks headquarters there are 8 Janpad Panchayats at CD block level.

5.2.1.5. Umaria

According to Census 2011, the total number of villages in the district are 653, out of which 594 villages are inhabited and 59 villages are uninhabited. There are 5 tahsils and three number of CD blocks viz Manpur, Umaria (Karkeli) and Pali No.2 in the district. Tahsilwise number of villages are Bandhogarh(108), Chandia(153), Manpur (229), Pali(103) & Nowrozabad(60). Besides, As per urban classification, the district has Umaria (M), Chandia(NP), Pali(NP), Nowrozabad(NP) are four towns and Goraiya(CT), Maliya Guda(CT) and Mahura(CT) are the three Census Town. There are 233 Gram Panchayats, 03 Janpad Panchayats and a District Panchayat. There are 243 Patwari halkas.

5.2.2. Population

5.2.2.1. Niwari

The Niwari city is divided into 15 wards for which elections are held every 5 years. The Niwari Nagar Panchayat has population of 23,724 of which 12,440 are males while 11,284 are females as per report released by Census India 2011. Population of Children with age of 0-6 is 2919 which is 12.30 % of total population of Niwari (NP). In Niwari Nagar Panchayat, Female Sex Ratio is of 907 against state average of 931. Moreover Child Sex Ratio in Niwari is around 822 compared to Madhya Pradesh state average of 918. Literacy rate of Niwari city is 77.16 % higher than state average of 69.32 %. In Niwari, Male literacy is around 85.61 % while female literacy rate is 67.97 %. Niwari Nagar Panchayat has total administration over 4,579 houses to which it supplies basic amenities like water and sewerage. It is also authorized to build roads within Nagar Panchayat limits and impose taxes on properties coming under its jurisdiction.

5.2.2.2. Panna

In 2011, Panna had population of 1,016,520 of which male and female were 533,480 and 483,040 respectively. In 2001 census, Panna had a population of 856,558 of which males were 450,549 and remaining 406,009 were females. Panna District population constituted 1.40 percent of total Maharashtra population. In 2001 census, this figure for Panna District was at 1.42 percent of Maharashtra population. There was change of 18.67 percent in the population compared to population as per 2001. In the previous census of India 2001, Panna District recorded increase of 24.50 percent to its population compared to 1991.

5.2.2.3. Rewa

In 2011, Rewa had population of 2,365,106 of which male and female were 1,225,100 and 1,140,006 respectively. In 2001 census, Rewa had a population of 1,973,306 of which males were 1,016,687 and remaining 956,619 were females. Rewa District population constituted 3.26 percent

of total Maharashtra population. In 2001 census, this figure for Rewa District was at 3.27 percent of Maharashtra population. There was change of 19.86 percent in the population compared to population as per 2001. In the previous census of India 2001, Rewa District recorded increase of 26.90 percent to its population compared to 1991.

5.2.2.4. Satna

In 2011, Satna had population of 2,228,935 of which male and female were 1,157,495 and 1,071,440 respectively. In 2001 census, Satna had a population of 1,870,104 of which males were 971,396 and remaining 898,708 were females. Satna District population constituted 3.07 percent of total Maharashtra population. In 2001 census, this figure for Satna District was at 3.10 percent of Maharashtra population. There was change of 19.19 percent in the population compared to population as per 2001. In the previous census of India 2001, Satna District recorded increase of 27.60 percent to its population compared to 1991.

5.2.2.5. Umaria

In 2011, Umaria had population of 644,758 of which male and female were 330,674 and 314,084 respectively. In 2001 census, Umaria had a population of 515,963 of which males were 265,128 and remaining 250,835 were females. Umaria District population constituted 0.89 percent of total Maharashtra population. In 2001 census, this figure for Umaria District was at 0.85 percent of Maharashtra population. There was change of 24.96 percent in the population compared to population as per 2001. In the previous census of India 2001, Umaria District recorded increase of 22.60 percent to its population compared to 1991.

5.3. Nutrition and Health Status

As clear from the table 1, the study areas is tribal predominating wherein the total ST constitutes 46.7% of total population of Umaria followed by Panna with 17.49% then Satna with 14.81% and Rewa with 13.6%. However Niwari remains the exception when it comes to tribal dominating areas. This data clearly justifies the fact of selection as traditional foods can be best studied with indigenous community. Indigenous people are those who retain knowledge of the land and food resources rooted in historical continuity within their region of residence and are best describe as tribes.

They mainly depend on cultivation and animal farming for their livelihood along with some contribution from forestry, and labor with minor contribution from diverse occupations. Several studies have reported sub-optimal nutritional status of children and adults of tribal community. The changing climate situation and environmental degradation presents a

challenge to the maintenance of livelihoods, agricultural, and environmental biodiversity. Also the condition of women and children are question of concerns as shown in Table 5.1 where the poor nutritional and health indicators are crying out for emergent actions to be dealt with.

Table 5.1 : Population status and Health indicators of study area

Particulars		Madhya Pradesh	Umaria	Panna	Satna	Rewa	Niwari (Tikamgarh)
Annual exponential growth rate		1.9	2.2	1.7	1.8	1.8	1.8
Total Population	2011	72597565	643579	1016028	2228619	2363744	167893
	2018	87081745	771981	1171892	2590772	2747855.6	198261
ST Population	2011	15316784	300687	170879	319975	311985	4761
	2018	18372686	360678	204971	383814	374230.16	5710
ST %age of Total Population		21.10	46.72	17.49	14.81	13.62	2.88
Health Statistics	IMR	47	61	87	92	72	67
	MMR	173	361	322	268	268	386
	U5MR	40	105	132	138	107	91
Nutritional Status	Stunting	38.4	41.1	42.3	41.2	40.4	49.7
	Wasting	21	27.4	24	26.6	18	19.2
	Underweight	35.7	46.6	40.8	39.6	36.2	43.3

D. SECTION FOUR –IMPLICATIONS OF THE STUDY (Results and Findings)

This section deals with the analysis of the intensive research and represents the key findings of the study broadly as per the detailed tools taken up for the same. It focuses on –

1. Detailed Household questionnaires focusing on Demographic, socio-economic structure, social class, occupation and earnings, crops and cultivation, housing structure, educational background, food consumption pattern and health status
2. Detailed dietary food frequency analysis, nutrient intake, RDA differences
3. Basic Nutritional Status and health indicators through anthropometry and clinical assessment.
4. Consumption pattern and availability of locally available food.

I. Sub-section One – Profile of Community Households (Based on Household Surveys)

6. Chapter Six – Socio-economic and Demographic Characteristics (HHs)

The socio-economic profile discusses the demographic characteristics, social classifications, and age wise distribution of respondents of the sampled households. Two fifty total households are covered during the research wherein, 25 households were interviewed from each of the two villages of the respective districts. The respondents belong to different age-group and both males and females have participated and cooperated throughout the research. The detailed analysis point-wise below –

6.1. Demographic characteristics

The demographic characteristics of sampled household are presented in Table 6.1. The table shows the population, household size and social classification of the sampled household.

6.1.1. Population

As depicted from Table and figure 6.1, the total population of the surveyed households is computed as 1374, wherein the population is dominated by females by 2 % i.e. 59% of total population is female (696) followed by males with 49%(678).

Table 6.1 : Demographic characteristics

Districts		Niwari	Panna	Rewa	Satna	Umaria	Total
Total	M	134	114	152	153	125	678
Number of members in the household	%age	10%	8%	11%	11%	9%	49%
	F	146	116	131	172	131	696
	%age	11%	8%	10%	13%	10%	51%
Members 15-49	M	97	76	92	92	89	446
	%age	7%	6%	7%	7%	6%	32%
	F	95	66	95	96	81	433
	%age	7%	5%	7%	7%	6%	32%
Members 5-14	M	25	30	37	45	31	168
	%age	2%	2%	3%	3%	2%	12%
	F	32	30	20	46	36	164
	%age	2%	2%	1%	3%	3%	12%
Members >5	M	15	14	24	19	8	80
	%age	1%	1%	2%	1%	1%	6%
	F	16	14	15	27	11	83
	%age	1%	1%	1%	2%	1%	6%
Total		280	230	283	325	256	1374

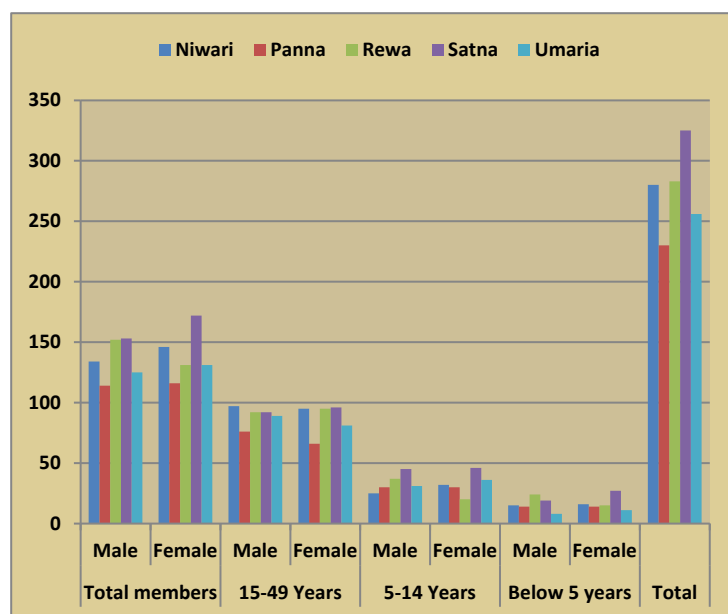


Figure 6.1: Population Status

The similar fashion is observed in all the districts except for Rewa where the situation is reversed and has more male population than females. 25% of the total population of the surveyed households is framed by children between 5-14 years of age including adolescents too, amongst which 50% are males and 50% are females. However, 12 % of total population is constituted by children below 6 years of age and this includes both girl and boys in equal numbers (Approx) 83 and 80 respectively.

The pattern clearly states that in all the four districts female population is more than in each age group, except for Rewa where, male population in each age group is comparatively great.

Observation statement: *This could be site to check if female feticide is deliberate in the district or not.*

6.1.2. Census Classification

Census classification of population by categories is demonstrated in Table 6.2 and Figures 6.2 and 6.4.

Scheduled tribes frames 72% of the total surveyed population which is followed by OBCs with 22% then SC with 4% and only 3% general categories.

Amongst all the districts Panna has 19% of STs followed by Satna(17%), Umaria and Rewa(16%). Niwari had least of ST population of them i.e. 4% but has maximum OBC population of about 13% then rest of the districts.

Table 6.2: Census category wise classification

Districts	Niwari	Panna	Rewa	Satna	Umaria	Total
SC	2	7	0	1	0	10
%age	1%	3%	0%	0%	0%	4%
ST	11	47	39	43	40	180
%age	4%	19%	16%	17%	16%	72%
OBC	33	0	8	6	9	56
%age	13%	0%	3%	2%	4%	22%
General	4	0	3	0	1	8
%age	2%	0%	1%	0%	0%	3%

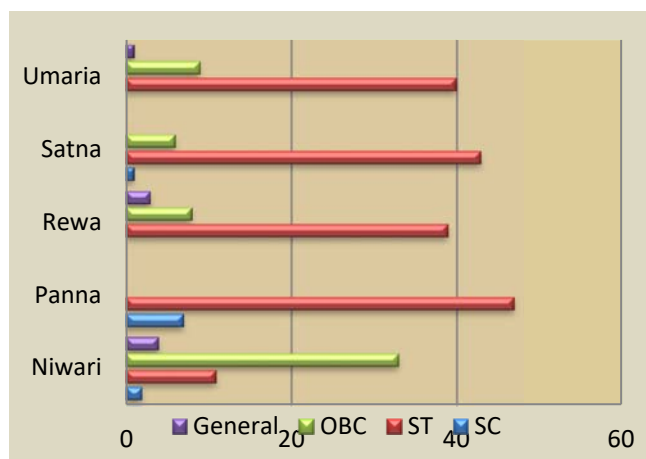


Figure 6.3 : District wise distribution of population

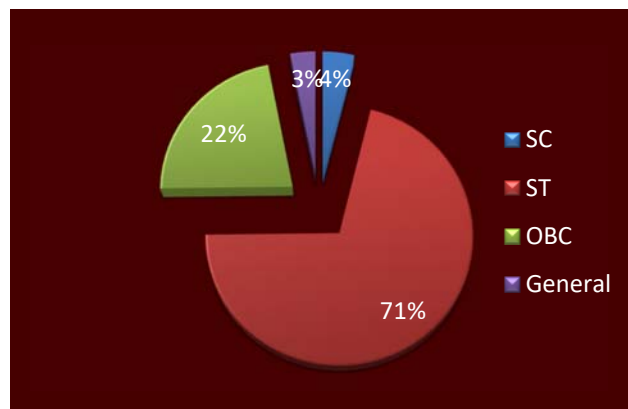


Figure 6.2 : Types of STs

Furtherance, figure 6.3 provides the types of Scheduled Tribes spread amongst the five districts during the survey. About 43% of STs are gonds, followed by Khairwar (19%) and Mawasi (12%). Kol constitutes 9% whereas Saur is limited to 5%.

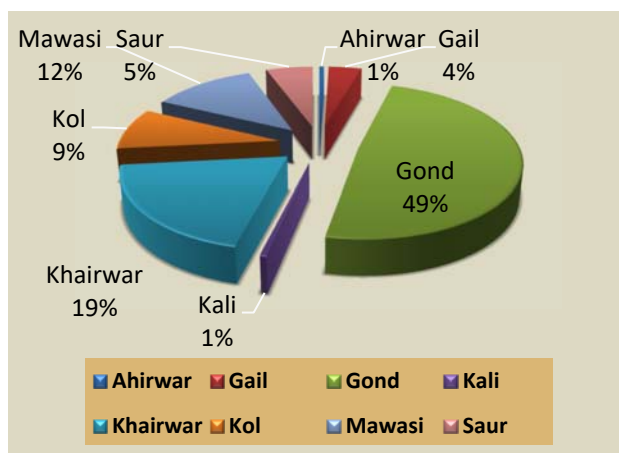


Figure 6.4: category wise distribution of population

Classification religionwise

As can be depicted from table 6.3, religion wise distribution suggests that only 2% of the surveyed HHs belongs to religion other than Hindu, i.e. Muslim belongs to Niwadi

Districts	N	P	R	S	U	T
Hindu	49	50	50	50	50	249
Muslim	1	0	0	0	0	1
Sikh	0	0	0	0	0	0
Christian	0	0	0	0	0	0
Others	0	0	0	0	0	0
Total	50	50	50	50	50	250

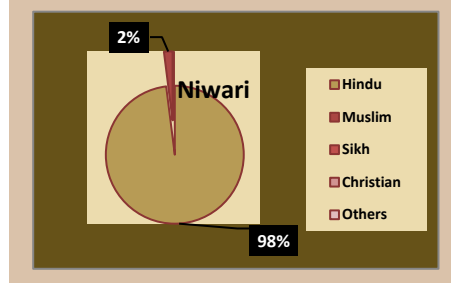


Table 6.1 : Religion wise distribution

6.2. Family /Household Structure

The definition of family by UNICEF encompasses the unit that has all the members together in a kinship. However, the modern concept of family is replaced with the term household and it in broader terms is defined as one single unit, where all people living together. The household/family structure includes present members, their characteristics with regards to age, gender and numbers; type of family etc.³¹

6.2.1. Family type

As shown in table 6.4 and figure 6.5, 67% of the total household surveyed, have nuclear family structure against 33% of families still lives in joint family system.

Table 6.2 : Family Type

Districts	Nuclear	%age	Joint	%age
Niwari	36.00	72%	28%	6%
Panna	45.00	90%	10%	2%
Rewa	38.00	76%	24%	5%
Satna	14.00	28%	72%	14%
Umaria	35.00	70%	30%	6%
Total	168.00	67%	82.00	33%
%age	67%	0%	33%	0%
SS	250	250	250	250
Mean	33.60	13%	16.40	7%
SD	10.40	4%	10.40	4%

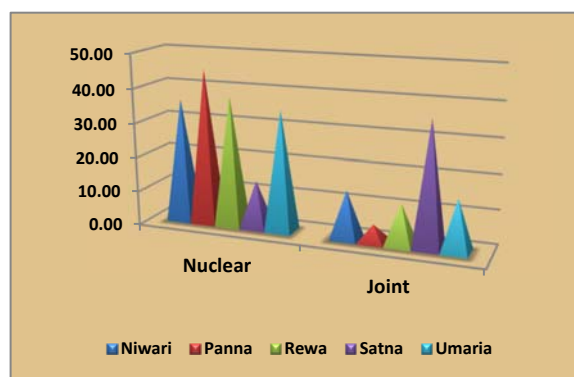


Figure 6.5: Family Type

All the districts have shown similar fashion except for Satna, where, 72% of total families surveyed belong to joint family system against 28% of those belong to nuclear.

Joint family system has direct connection with the quantity of food intake. Mean value signifies that this observation can be true for Satna where 13%+4% family belongs to nuclear and 7%+4% are joint family system

6.2.2. Ownership of Household

Table 6.5 and figure 6.6 demonstrate, the ownership of the house and state that 99% of the total household of all the five districts are owned by the family itself. Except for 1 from Satna, where the family doesn't have their own household and is living on rent.

Table 6.3 : Household ownership

Districts	Own	Rented	Total
Niwari	50.00	0.00	50.00
Panna	50.00	0.00	50.00
Rewa	50.00	0.00	50.00
Satna	49.00	1.00	50.00
Umaria	50.00	0.00	50.00
Total	249.00	1.00	250.00
%age	100%	0%	100%
SS	250.00	250.00	250.00
Mean	49.80	0.20	50.00
SD	0.40	0.40	0.00

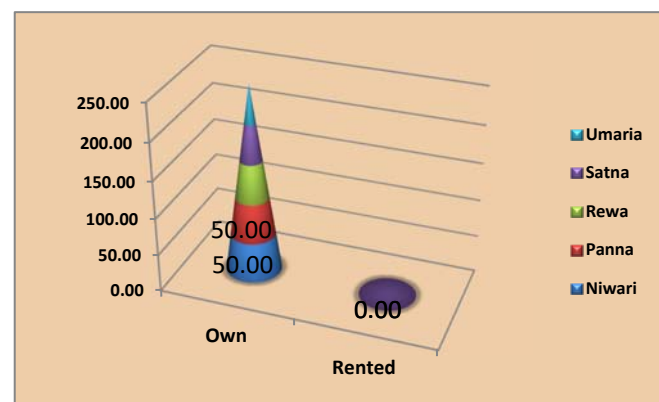


Figure 6.6 : Household Ownership

6.2.3. Family size

Family size has its own socio-economic implications, the more the family size, the lesser are the chances of lower or poor intake of food, provided the economy of that particular household.

Table 6.4 : Family size

Districts	ST	Sc	OBC	General
Niwari	5.70	4.00	5.40	6.80
Panna	5.00	2.00	5.00	0.00
Rewa	5.10	0.00	6.30	7.00
Satna	6.50	3.00	4.00	0.00
Umaria	5.20	0.00	4.70	4.00
Total	5.40	5.00	5.50	4.00
Mean	5.27	4.00	5.57	4.60
SD	0.31	1.63	0.54	3.25

³¹ Brian D. Carpenter, Elizabeth A. Mulligan, in Handbook of Assessment in Clinical Gerontology (Second Edition), 2010

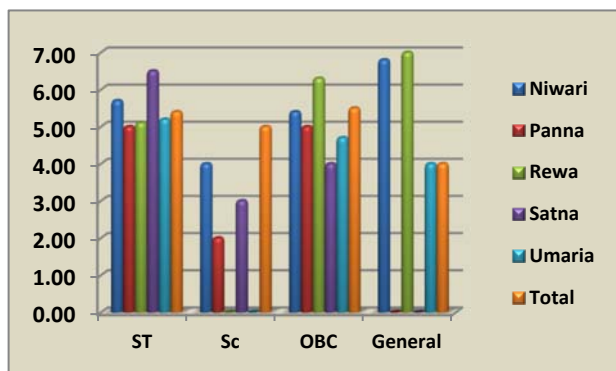


Figure 6.7: Family size of Household

The average family size of the household is depicted as 5.40 and mean as 5.27 \pm 0.31 for all the five districts that is. The family size of the household could range from 4.95-5.57, which would be true for all the five districts.

However, Satna has the largest household size from other districts i.e. 6.50 for Scheduled tribes.

Additionally it is clear from the table 6.6, that, at any given point, ST household size is greater than SCs and OBCs.

6.2.4. Age of Head of Household

The heads of the households interviewed, falls into five categories broadly as presented in table 6.7 and figure 6.8

Table 6.5: Age group of head of HHs

Districts	26-35	36-45	46-55	56-65	65+	Total
Niwari	9	17	10	12	2	250
Panna	21	11	11	5	3	250
Rewa	17	13	12	6	1	250
Satna	15	18	5	10	1	250
Umari	14	8	11	13	2	250
Total	79	67	49	46	9	250

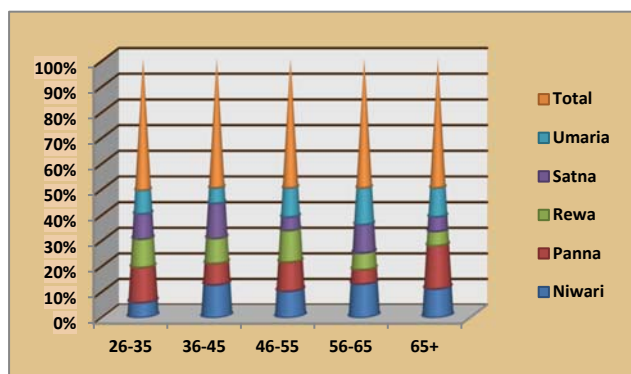


Figure 6.8 : Age group of Head of HHs

As head influence the buying, consumption power of the households, their age group reflects the wisdom of decision making. In this study, the maximum of households (30%) are headed by young individuals belonging to 26-35 years of age, followed by 36-45 years by 27%. Very small number

of about 4% of HHs' heads belongs to 65+ age. Similar fashion is recorded for all the five districts also.

6.3. Housing infrastructure

Housing infrastructure is comprehensively prorated into types of rooms, walls, roofs, floors.

6.3.1. Type of house

AS presented in table 6.8 and figure 6.10, 170, i.e. 68% of total households are kachha houses, and 18% (44) are semi-pucca houses; whereas, only 14% of the total households are constructed and have pucca infrastructure.

Table 6.6 : Types of house

Districts	Kachha House	Semi Pucca	Pucca	Total
Niwari	7	35	10	52
Panna	40	2	6	48
Rewa	46	2	2	50
Satna	48	1	1	50
Umari	29	4	17	50
Total	170	44	36	250

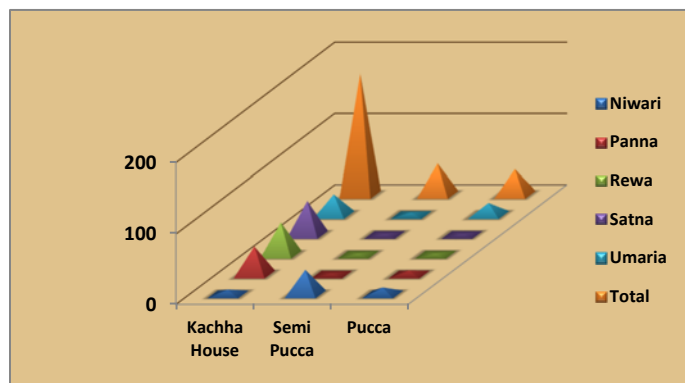


Figure 6.9: Types of houses

Amongst the districts, Niwari has maximum number of semi-pucca houses i.e. 72% of total houses of Niwari have semi-pucca construction, whereas, Panna (80), Satna (96%), Rewa (92%) has maximum kachha houses

6.3.2. Types of Floors, roofs and walls

House infrastructure plays a significant role in determining health of any individual. The kachha houses in present scenario have implications on health in terms of maintenance of cleanliness. The floors, roofs and walls in rural setups are predominant with kachha materials.

Table 6.9 and figure 6.11 depict the conditions of household studied.

Table 6.7: Types of Floors, roofs and walls

Districts	Niwari	Panna	Rewa	Satna	Umaria	Total	%age
Mud Floor	41	46	42	38	25	184	74%
Sand/Dung Floor	43	5	1	5	1	55	22%
Wooden planks floor	2	5	1	28	2	38	15%
Brick Floor	19	1	2	6	4	32	13%
Finished woods Floor	1	4	1	5	0	11	4%
Cemented Floor	26	1	0	5	7	39	16%
No roof	22	0	32	0	0	184	74%
Thatch Leaves Roof	3	12	1	3	15	34	14%
Wooden Planks Roof	24	1	2	11	0	38	15%
Cemented Roof	24	0	1	1	15	41	16%
Burnt Bricks roof	8	0	0	0	8	16	6%
No walls	0	0	1	18	1	20	8%
Mud walls	48	15	43	30	7	143	57%
Stone Walls	40	17	0	16	2	75	30%
Cemented Walls	25	2	2	0	1	30	12%

6.3.2.1. Floor Type

Table and figure both clearly draws the fact that 74% of the households have mud flooring 16% of cemented floors. 22% of the households have reported to have cow-dung flooring. 15% and 13% of Households have wooden plank floors and brick floors respectively.

Amongst the districts, maximum households between 75-95% reported to have mud and cow-dung floors and as little as 2-5% have cemented floor (Table 6.9 and figure 6.11)

6.3.2.2. Roof types

74% of the total household surveyed reported to have no roofs at all. They are barely made up of thatch leaves, burnt bricks, and wooden planks. Merely 16% of the households have cemented roof. The condition is no different in the districts. (Table 6.9 and figure 6.11)

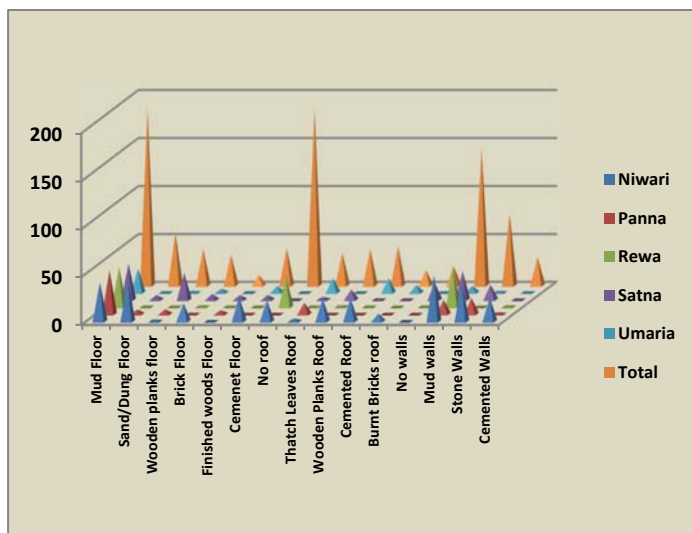


Figure 6.11: Graph on Floor, Roof and Wall type

6.3.2.3. Wall types

Rural households surveyed are prevalent in having mud walls. Almost 57% of total have mud walls followed by 30% of stone walls and 12% of cemented walls.

Rewa is depicted to have maximum households have mud walls (86%) followed by Satna (60%). The maximum households having cemented walls is reported in Niwari (50%) and rest of them have stone walls.

Panna and Umaria has equal ratios of mud and stone walls (80%) and very less of them have cemented walls. (Table 6.9 and figure 6.11)

6.3.3. Number of rooms

Numbers of rooms in these households are adduced in table 6.10 and figure 6.12. It states that 42% of the total households have two rooms, when in fact, 26% of those have single rooms and 24 % have 3-4 rooms.

Panna, Satna and Umaria have maximum households (55%) having two rooms. whilst Niwari stands out with 16 households (32%) having more than 4 rooms, which also is the only districts amongst the five to have reported this infrastructure i.e. 8% of total HHS surveyed.

Table 6.8: Number of rooms

Districts	Only 1 room	2 rooms	3-4 Rooms	More than 4 rooms	Total
Niwari	4	7	23	16	50
Panna	20	27	3	0	50
Rewa	15	19	14	2	50
Satna	8	26	14	2	50
Umaria	18	27	5	0	50
All	65	106	59	20	250
%age	26%	42%	24%	8%	100%

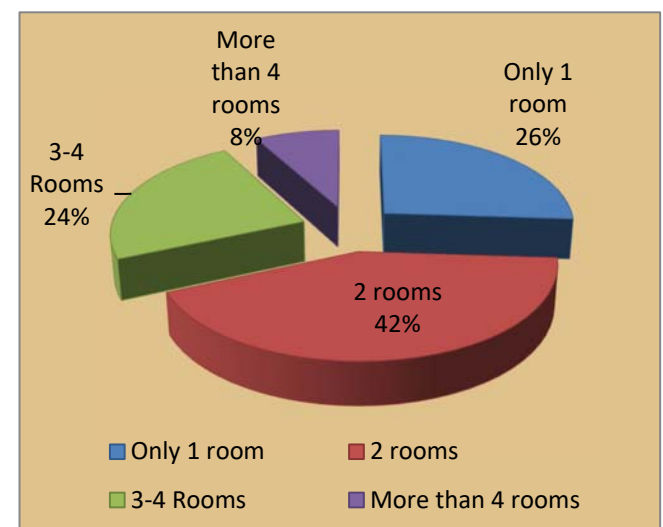


Figure 6.10 : Number of rooms

6.4. Information and Mass Media

This segment approaches with the connectivity to the outer world through information technology. Widely comprises of –

6.4.1. Basic Amenities

Basic amenities are presented in Table 6.11 and figure 6.13 for all the five districts, from maximum to minimum availability of facilities provided at rural setups.

Table 6.9: Basic amenities

Districts	Niwari	Panna	Rewa	Satna	Umaria	Total	%age
Electricity	48	45	46	43	42	224	94%
Mattress	19	5	5	12	24	65	26%
Pressure cooker	13	5	5	4	2	29	12%
Chair	37	0	17	11	10	75	30%
Bed	38	16	9	26	29	118	47%
Table	23	7	4	0	2	36	14%
Electric Fan	49	25	26	22	8	130	52%
Radio	21	1	8	1	3	34	14%
Colour TV	39	1	1	2	1	44	18%
Sewing Machine	3	2	13	1	3	22	9%
Mobile	49	42	39	44	22	196	78%
Internet	39	0	0	1	0	40	16%
Computer	3	0	0	0	0	3	1%
Refrigerator	3	0	0	0	0	3	1%
Cooler	0	0	0	0	1	1	0%
Watch/Clock	43	5	6	11	9	74	30%
Bicycle	47	18	34	22	25	146	58%
Motorcycle	38	7	5	6	2	58	23%
Animal cart	6	0	0	2	2	10	4%
Car/Jeep	0	0	0	1	0	1	0%
Water pump	5	0	1	4	3	13	5%
Thresher	1	0	0	0	0	1	0%
Tractor	3	1	0	0	0	4	2%

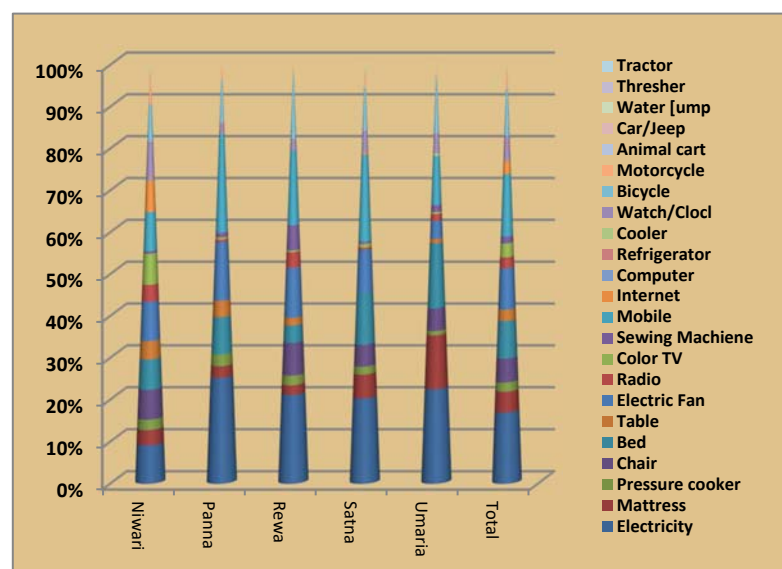


Figure 6.12: Basic amenities utilized

6.4.1.1. Electricity and electronics

Electricity is available at 96% of the surveyed households, those are provided with electric meter, however, the power supply is huge issue especially during summer due to load shedding.

52% of the total households have electric fan which is used for getting rid of mosquitoes. Niwari with 49% of the households have maximum electric fans.

Only 14% of the households have radios and 18% are provided with color televisions.

Other districts compared to Niwari have fairly low percentage of electronics.

6.4.1.2. Furniture

Bed is provided with 47% of the total households and maximum of them are available in Niwari then Umaria and Satna with 76%, 58% and 52% respectively.

Chairs are available at 30% of total HHs, maximum of them are reported from Niwari (75% of Total HH of Niwari)

Only 14% of the total HH has chairs available.

26% of the households have mattresses in the form of *chatai or dari*.

6.4.1.3. Information technology

Maximum households (78%) have reported to have mobile phones, wherein 80%-98% of the households of 4 districts have mobile phones except for Umaria where only 44% of HHs have any phones at all.

Computer is available in 3 households on Niwari making a total percentage of 1%

6.4.1.4. Home appliances

1% i.e. only 3 households have reported to have refrigerator coming from Niwari only. Only one household in Umaria has cooler framing 0.5% of the total surveyed.

9% of the HHs have sewing machine, where woman sometimes stitch for themselves and only 2-3 are employed in any sewing occupation. 30% of them have wall clocks

6.4.1.5. Agriculture equipments

Two percent of households have tractors (Niwari and Panna), whereas one HH have jeep (Satna) and one thresher (Niwari). 4% of HHs have animal carts wherein maximum of them is reported from Umaria.

6.4.1.6. Transport

58% of total households (148 out of 250) have bicycles, mostly used by school going boys and girls. 23% of HHs have reported to have motorcycle wherein Niwari has 76% of its total HHs, to have motorcycle.

6.4.2. Types of fuel used

Types of fuels used for cooking is demonstrated in Table 6.12 and figure 6.14. The most used type of fuel comes from wood and is used by 92% of the household. Similarly, all the households (80-90%) of all the districts are dependent on wood mostly for fuels. However, LPG are consumed only by 48% of HHs wherein, both Niwari and Panna HHs have reported to use LPG in their maximum HHs (85-95%). Coal and charcoal is bygone and is consumed by 2% of HHs only.

Cow dung is still preferred by 44% of HHs especially in Umaria where 88% of households are utilizing this as source of fuel.

Table 6.10: Types of fuels

Districts	Niwari	Panna	Rewa	Satna	Umara	Total	%age
Electricity	46	1	0	0	0	47	19%
LPG	40	45	9	16	9	119	48%
Biogas	0	0	0	1	0	1	0%
Kerosene	0	0	0	21	0	21	8%
Coal	2	0	0	0	2	4	2%
Charcoal	1	0	0	2	1	4	2%
Wood	45	47	43	49	47	231	92%
Waste	40	0	0	0	0	40	16%
Cow dung	43	0	2	20	44	109	44%
Total	88	46	9	38	11	192	77%

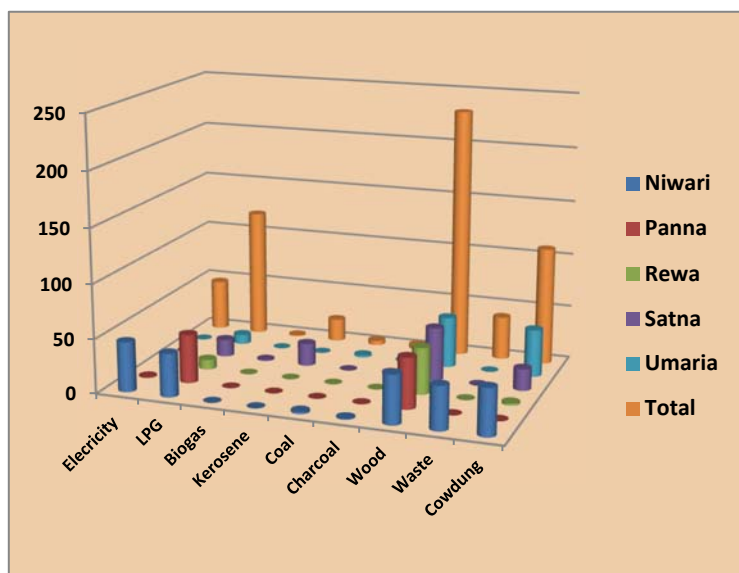


Figure 6.13: Types of fuel used by HHs

6.4.3. Mass Media

Mass media is covered in table 6.13 and figure 6.15

It defines if the mass media is used by rural individuals to remain connected with outer world and news across the globe.

Table 6.11 : Usage of Mass media

Districts	TV	Radio	News-paper	HH uses media	No mass media
Niwari	38	5	5	48	2
Panna	1	0	5	6	44
Rewa	5	16	1	22	28
Satna	10	0	11	21	29
Umara	0	2	0	2	48
All 5 districts	54	23	22	99	151
%age	22%	9%	9%	40%	60%

The people from rural setups have shown lesser connectivity with outer world. Sixty percent of total households do not use any mass media at all against 40% of the mass media users. 22% of total HHs (250) connect with news through TV while 18% households uses radio and news papers equally.

Amongst districts, Niwari stands out for having connect with the news as 96% of total HHs of the districts reported to have been using any form of mass media, whereas in other districts the condition is totally opposite.

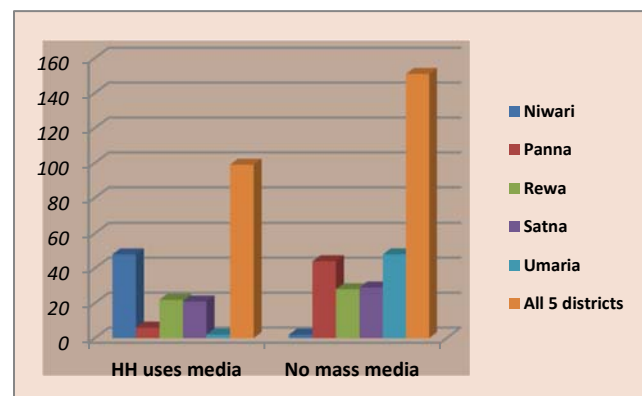


Figure 6.14: Usage of mass media by ruralites

6.5. Connectedness

As the study focuses predominately on tribal population and 72% of the total surveyed households belong to Scheduled Tribes, it is important to understand their network with the peripheral zones.

6.5.1. Distance from nearest town

As on view from table 6.14 and figure 6.16, the villages of Panna are far situated from main town i.e. 24 kms, followed by Umaira for 20 kms. The nearest villages to town belong to Rewa where both of the villages are as near as 7 kilometers.

The mean distance of village 1 is found to be 9.8 kms with SD +4 kms i.e. the villages nearest villages from all the districts lie at periphery of 5.8 to 13.8 kms and the farthest village lies at periphery of 14.6 +6 i.e. 8.6 kms to 20.6 kms.

Table 6.13: Conveyance Modes

Districts	Distance to nearest town from Village 1	Distance to nearest town from Village 2	Average
Niwari	9	10	10
Panna	18	24	21
Rewa	7	7	7
Satna	5	12	9
Umaria	10	20	15
Total	49	73	61
Mean	9.8	14.6	12.2
SD	4	6	5

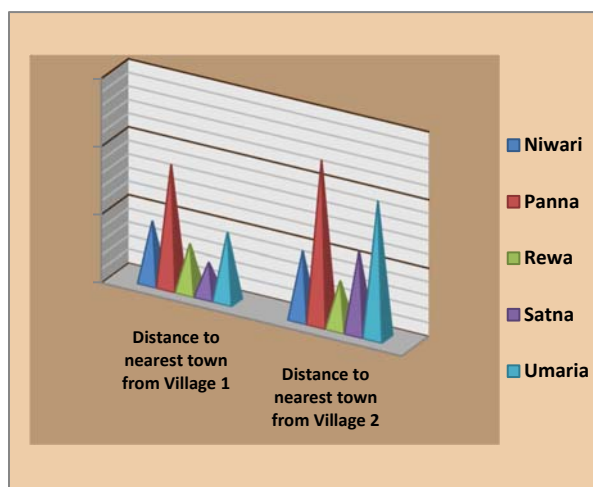


Figure 6.15: Distance from nearest town

The distance determines the health services and medical conditions of the villagers. The farthest they are, the higher are the chances for morbidity and mortality.

6.5.2. Mode of transport

Commuting to nearest town for daily requirements, when town is far away is hectic task on hands of these villagers. Devoid of public conveyance put extra burden on their pockets. As seen from table 6.15 and figure 6.17, 66% of households use auto for transport.

Table 6.12: Distance from nearest town

Districts	Private vehicle	Public conveyance	Tractor	Auto
Niwari	5	4	2	39
Panna	5	9	3	33
Rewa	27	2	1	20
Satna	1	5	5	39
Umaria	12	1	2	35
Total	50	21	13	166
%age	20%	8%	5%	66%
SS	250	250	250	250

The second reliable mode is private vehicle provided with households which could be motorcycle or bicycle(20% of HHs)

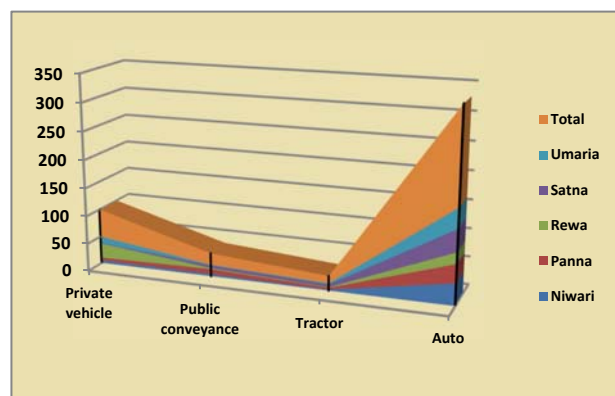


Figure 6.16: Mode of conveyance

The situation is same for all the districts, wherein 70-78% of HHs use auto for conveyance, except for Rewa where maximum people own private vehicle and use them to commute.

6.5.3. Account details

This would focus whether the ruralites are well connected with banks and other schemes, to be utilized using unique id and samagra card.

6.5.3.1. Bank accounts

Shown in Table 6.15, 97% of the total HHs have accounts in bank. Amidst the districts, Rewa and Umaria have shown exceptional cases for having 100% of Households with bank accounts, followed by Satna, Niwari and Panna with 98, 94 and 92 percent respectively. The left out are in the process in all the three districts

Table 6.14: Account details : Bank, Aadhar and Samagra

Districts	Bank Account	Aadhar	Samagra
Niwari	47	47	47
Panna	46	41	41
Rewa	50	49	48
Satna	49	48	46
Umaria	50	20	48
Total	242	205	230
%age	97%	82%	92%
SS	250	250	250
Mean	48.4	41	46
SD	2	11	3

6.5.3.2. Aadhaar card details

82% of the total households surveyed (250) reported to have aadhar cards. The maximum of those were reported from Rewa (98%) followed by Satna (94%), Niwari (94%)

and Panna (82%). The least is reported from Umaria with 40% only.

6.5.3.3. Samagra Cards

Presented in table 6.15, Samagra cards are found to have been present with 92% of Households. The maximum of those were reported from Rewa (98%) followed by Satna and Umaria (96%), Niwari (94%) and least from Panna with 40% only.

Observation statement:

This could be site to check if those who do not have aadhar cards and samagra cards are provided with basic schemes or not. They might be the member of NFSA and are devoid of monthly ration for not having Samagra and Aadhar cards.

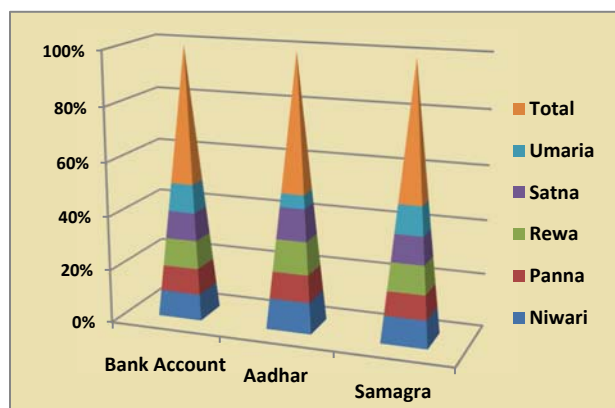


Figure 6.18: Account details

6.6. Educational Background

6.6.1. Educational status

The educational status of respondents and members of the households are briefed in table 6.17 and displayed in figure 6.19

Table 6.15: Educational Background

Districts	Middle School	6-10th Class	Higher Secondary	12+	Literate	Illiterate	Total
Niwari	29	21	0	0	0	0	50
Panna	46	4	0	0	0	0	50
Rewa	6	10	2	2	3	27	50
Satna	20	8	1	1	0	20	50
Umaria	15	9	2	2	0	22	50
Total	116	52	5	5	3	69	250
%age	46%	21%	2%	2%	1%	28%	100%
SS	250	250	250	250	250	250	250
Mean	23.2	10.4	1	1	0.6	13.8	50
SD	14	6	1	1	1	11	0

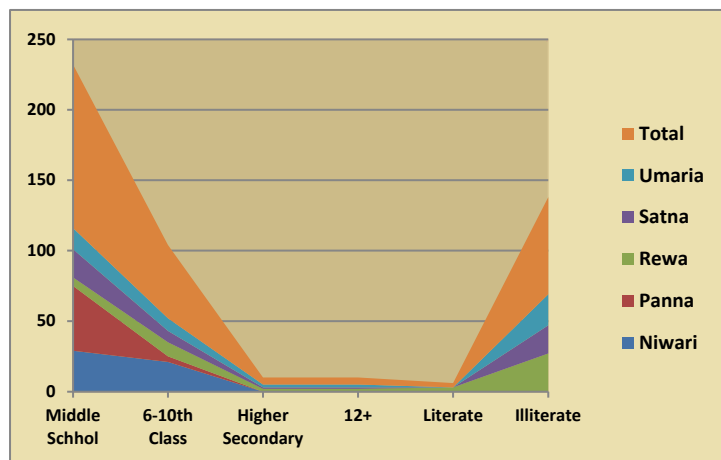


Figure 6.17: Educational background

6.6.1.1. Classes attended

Educational status is categorized middle school, high class, higher secondary and graduate, based on the information received during the study.

42% of the total respondents to have attended middle school, either cleared or not; whereas, 21 have attended 6-10th class. Barely 2% might have matriculated and graduated. This exception comes from Rewa and Umaria.

Maximum respondents from the districts have attended middle school only. 92% from Panna, followed by 58% from Niwari, 40% from Satna and 30 % from Umaria have reached middle school only. 20% of respondents from Rewa atleast reached to high school

6.6.1.2. Literacy ratio

The ratio of literacy is 18:7 for the entire 5 districts. There is one percent of population knows who to make signatures and 71% have attended any classes.

Unfortunately 54% from Rewa, 40% from Satna and 44% from Umaria don't know reading or writing and falls under category of illiterate.

6.6.2. Marital Status

Shown in table 6.18 and figure 6.20 the marital status of respondents suggests 95% of total respondents are married.

Table 6.16: Marital status

Districts	Married	Divorced	Separated	Widow	Never Married
Niwari	48	0	0	2	0
Panna	45	1	2	2	0
Rewa	49	0	0	1	0
Satna	49	0	0	1	0
Umaria	47	0	0	2	1
Total	238	1	2	8	1
%age	95%	0%	0	3%	0%

Maximum respondents (90-98%) from all the five districts are married whereas 3 % of the total respondents (250) are living single after death of their spouse.

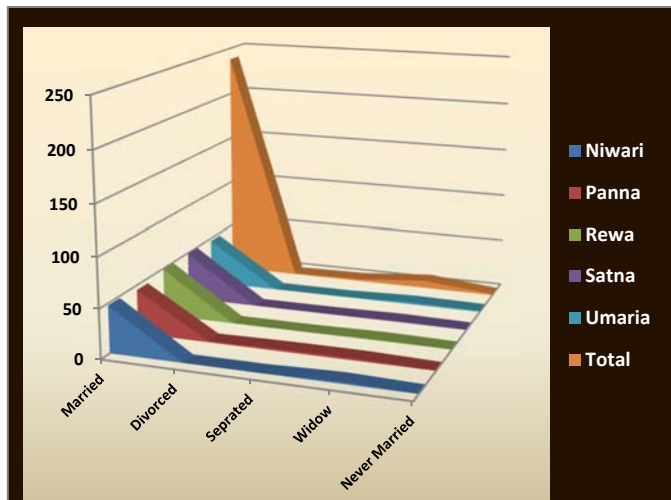


Figure 6.19: Marital Status

7. Chapter Seven – Health and WASH

This chapter covers the health status amongst the households, the common WASH facilities provides and health and illness status.

7.1. Source of drinking water

Depicted from table and figure 7.1, 75 % of total households rely on hand pumps for the source of drinking water. 37% of households have reported to have been deriving drinking water from public taps, which has functionality issues most of the time. 26% of the households however have been consuming from unprotected wells and those of 10% from protected wells.

Table 7.1: Source of Drinking water

Source of drinking water	Niwari	Panna	Rewa	Satna	Umaria	Total	%age
Piped to yard/plot/dwelling	2	1	0	1	0	4	2%
Public tap	35	42	1	14	1	93	37%
Hand pumps	45	47	38	25	33	188	75%
Protected Wells	8	1	0	0	15	24	10%
Unprotected Wells	35	0	10	20	1	66	26%
Rainwater	39	2	1	0	0	42	17%
Surface water	1	2	0	0	0	3	1%

Handpumps are used by in large by almost 90%, 94%, 76% and 66 % of population from Niwasi, Panna, Rewa and Umaria respectively. 70% of households of Satna use unprotected wells.

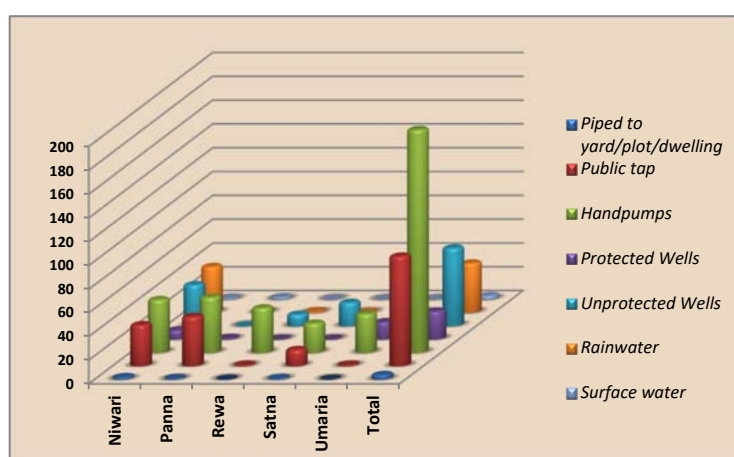


Figure 7.2 : Drinking water facilities

Surface water including rain water is also consumed for drinking as low as 1% of households.

7.2. Sanitation facilities

Focuses on toilet construction and its uses

7.2.1. Toilet structure

The type of toilets constructed is laid out in Table and figure 7.2. As can be predicted the toilet construction facilities, are in abhorrent state, wherein only 19% of the total households have any kind of toilets. 5% of the total households have dry toilets, compared to 6% of pit toilets.

Table 7.2 : Toilet Structure

Districts	Flush to septic tank	Flush to Pit toilets	Pit Toilets	Dry Toilets	No Facility	ODF
Niwari	0	2	1	11	3	33
Panna	6	6	0	0	32	6
Rewa	0	2	0	0	49	1
Satna	0	1	0	0	34	15
Umaria	2	2	13	2	33	2
Total	8	13	14	13	151	57
%age	3%	5%	6%	5%	60%	23%

Only 3% of households have toilets, those can be flushed to septic tanks and 5% of those can be flushed to pit toilets.

Functionality of these toilets is altogether a different issue. The toilets are basically used for keeping hay and fodder for cattle stock or used for something else but not for the very purpose, this should serve. Only 5% of the total households, having toilets, i.e. 47 households, use toilets for defecation

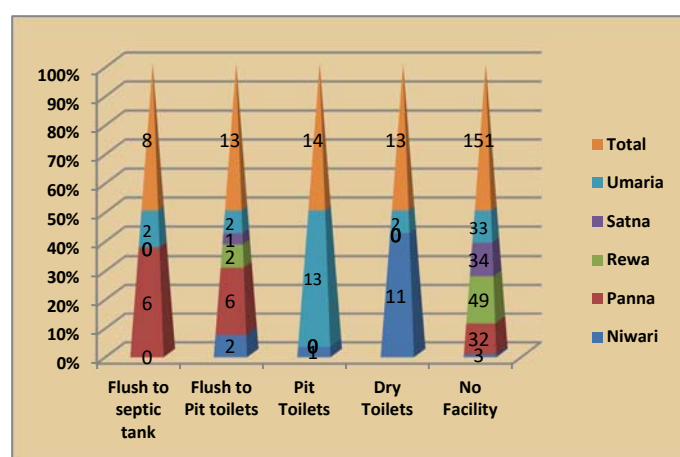


Figure 7.1 : Toilet Facilities

purpose. Same is true for all the districts individually, where in 22% of HHs of Niwari has dry toilets and 4% belong to Umaria. Status of toilets construction is better in Umaria compared to other districts.

7.2.2. Open Defecation Free Status

As shown in table 7.2 60% of total households surveyed, have no facilities at all. The open defecation free status as shown in figure 7.3 clearly states that only 23% of the total households have attained ODF status.

Maximum of which is achieved by Niwari (13% of 250 total HHS). In Niwari, 66% of its HHS, have attained the ODF status followed by Satna with 6%. Other districts are still lagging behind.

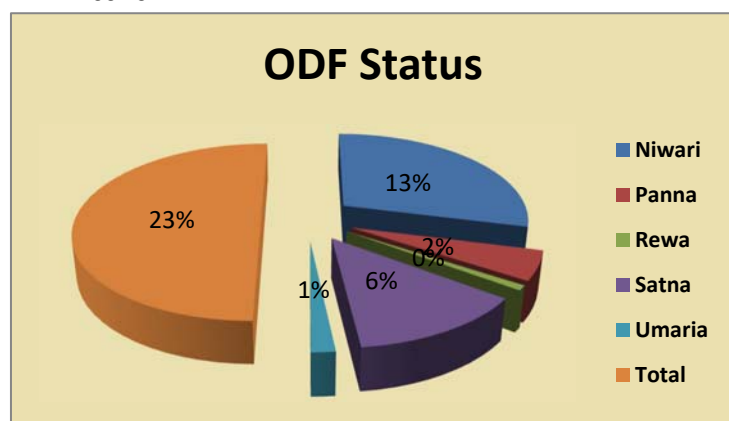


Figure 7.3 : ODF Status

7.3. Health Status

7.3.1. Illness reported during past fortnight

Members of households have reported to have been suffered from illness during past fortnight, the study was performed. These illness are recorded in table 7.3 and shown in figure 7.4

Table 7.3: Illness reported during last fortnight

Diseases reported	Niwari	Panna	Rewa	Satna	Umari	Total	%age
ARI	0	0	0	0	3	3	0.22%
Diarrhoea	0	0	2	0	2	4	0.29%
Dysentery	0	0	2	0	4	6	0.44%
Fever with chills	1	0	4	0	1	6	0.44%
Fever with rashes	0	0	4	0	3	7	0.51%
Jaundice	0	0	2	0	3	5	0.36%
Only fever	0	5	10	16	2	33	2.40%
TB	1	9	2	4	2	18	1.31%

There were total 1374 members in 250 households amongst which 678 were males and 696 were females. Out

of whom 85 people got sick in the past 15 days before the study took place.

7.3.1.1. Acute Respiratory Infection

About 0.25% suffered Acute Respiratory infection i.e. 2% of the total population surveyed in Umari.

7.3.1.2. Diarrhea and dysentery

Around 0.30 % of the population suffered diarrhea and about 0.50% suffered dysentery. The condition is seen in

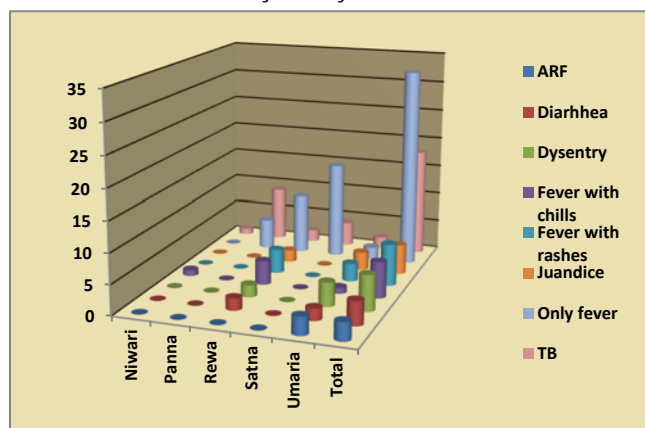


Figure 7.4 : Illness reported

Rewa and Umari where 4% and 5% of total population of respective districts have suffered the problem

7.3.1.3. Fever with chills / rashes and seasonal

1% of the total population suffered fever with chills and rashes. The conditions were again reported from Umari and Rewa.

Fever is reported to have suffered almost 3% of population from Umari and Satna wherein the percentage from Umari was high.

The population of Panna and Satna has reported only seasonal fever. Same is the condition with Niwari where only 1 case was reported suffering from fever with chills.

7.3.1.4. Jaundice and TB

0.36% of population has also suffered Jaundice and this condition is again observed in Umari and Rewa.

TB is however prevailing amongst all the districts and 1.5% approx of whole population has reported to have been suffering from TB

7.3.2. Medical Treatment

Medical treatment as adopted during any illness is recorded in Table 7.4 and figure 7.6

For medical treatment, 17% of the total households prefer private doctors, forasmuch as 15% of households seek

treatment from Public health facilities or government hospitals.

Shockinglly 12% of the population still believes in local quacks and do visit ojha hakim.

Table 7.5: Members facilities

Medical Facilities	Total	Niwari	Panna	Rewa	Satna	Umaria	%age
Public health facilities	37	0	1	26	6	4	15%
Private doctor/ clinic/ hospital	43	2	13	12	1	15	17%
Local quacks/ Jhola chap doctors	29	1	0	7	15	6	12%
Ojha/ hakim	11	0	0	3	0	8	4%
Home based treatment	5	0	0	0	5	0	2%
Hospital clinic run by locals	5	0	3	0	1	1	2%

Maximum public health facilities is reported to have used in Rewa i.e. 46% of total HHs surveyed in Rewa

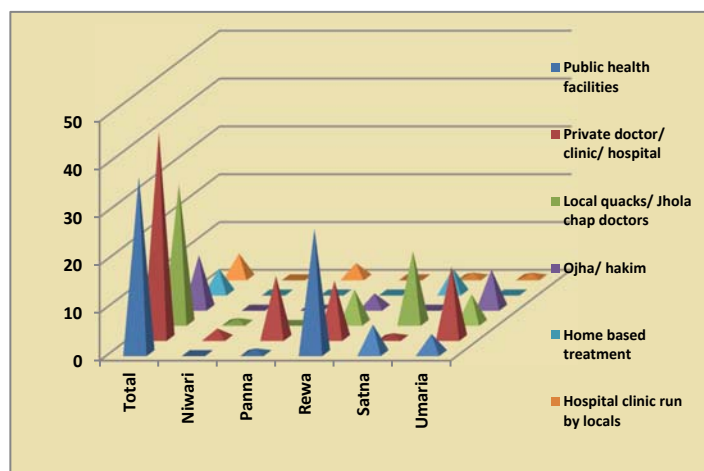
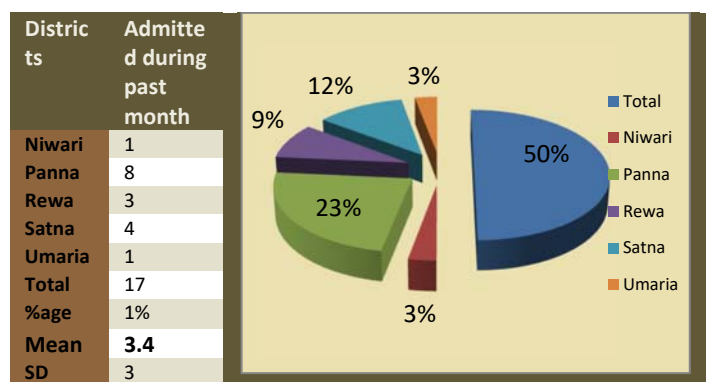


Figure 7.5: Medical treatments as adopted

7.3.3. Members Admitted in Hospital

Table 7.5 demonstrates the members those were admitted to hospital in past a month before the study took place. It states that 20 persons got admitted to hospital for any diseases.

Table 7.7 : Members admitted to Hospital



Out of which maximum of patients reported to have been admitted from Panna of about 23% followed by Satna (12%) and Rewa (9%). Contrary to which, 3% of the members, from Niwari and Umaria, were reported to have been admitted.

7.3.3.1. Gender-wise categorization

Represented in Table 7.4 and figure 7.6 , total 27 male members and 37 female members were admitted in the hospital during last 15 days framing 2% and 3% of total population respectively.

Table 7.6 : Gender wise categorization

Districts	Male members got ill in last 15 days	FeMale members got ill in last 15 days	Total members got ill during 15 days
Niwari	1	0	1
Panna	0	5	5
Rewa	7	17	24
Satna	8	8	16
Umaria	11	7	18
Total	27	37	64
%age	2%	3%	5%

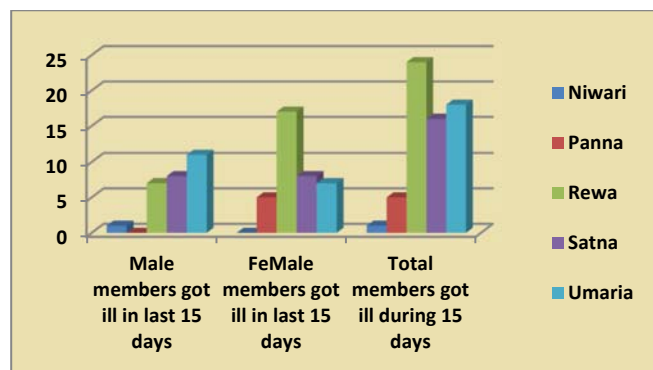


Figure 7.6: Gender-wise categorization

7.3.3.2. Age wise categorization

As described in Table and figure 7.7, 11 children below 5 years of age got sick framing one percent of total population (1374)

Table 7.8: Age-wise categorization

Districts	Children below 5 years who got ill	5-12 years who got ill	12-18 Years	18-30 Years	31-50 Years	50+ Years
Niwari	0	0	1	0	0	0
Panna	0	0	0	5	0	0
Rewa	7	4	7	6	1	0
Satna	4	0	2	4	0	4
Umaria	0	1	3	5	8	2
Total	11	5	13	20	9	6
%age	1%	0.5%	1%	1%	1%	0%

Additionally 5 children of 5-12 years of age got sick in the entire period that frames 0.5 of total population. The maximum children of both age- groups belonged to Rewa (7% of total surveyed population)

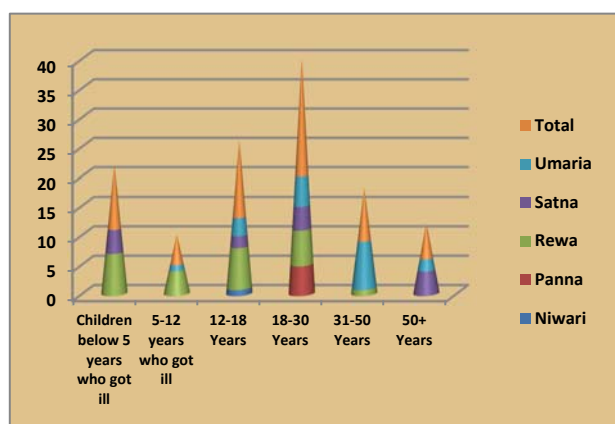


Figure 7.7: Age-wise categorization

13 adolescent of age group 12-17 years followed by 20 young adults 9 middle-aged and 6 old people have fallen sick. In all 64 people have fallen ill, primarily due to unhealthy and unhygienic conditions.

7.3.4. Deworming Status

Deworming status is presented in table and figure 7.8. It articulates that, only 13% of the households have gone for deworming for their children only, wherein 6% of the total households get it done in the past three months.

Contrary to what AWW has reported, 87% households have no knowledge of deworming and have confirmed that, none of their family members have ever taken deworming tablets or medicines in any form.

Table 7.9: Deworming status

Districts	Deworming Status	Last 3 months
Niwari	0	0
Panna	0	0
Rewa	27	15
Satna	3	0
Umaria	2	0
Total	32	15
%age	13%	6%

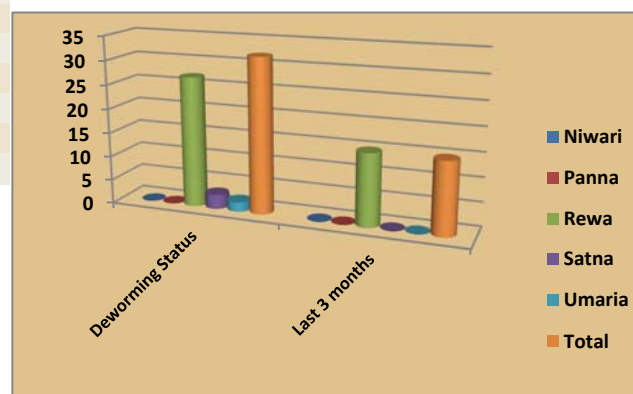


Figure 7.8: Deworming status

Amongst the districts, 54% of Rewa's HHs have taken any deworming pills provided by Anganwadi workers and 30% of them have ever consumed it in past 3 months.

7.4. Nicotine consumption Status

Consuming nicotine in any form (bidi or gutka) is common amongst villagers.

7.4.1. Smoking Status

The status is illustrated in table 7.9 and figures 7.9 and 7.10. 48% of the respondents are consuming tobacco in the form of bidi.

Table 7.10 : Tobacco consumption

Districts	Smoking by respondent	Number of bidis	Smoking by other members apart from respondent	Number of members in a family smoke bidi or chew tobacco on an average
Niwari	29	20	28	2
Panna	15	9	9	2
Rewa	27	23	19	2
Satna	37	21	27	2
Umaria	11	9	9	2
Total	119	82	92	10
%age	48%		37%	1%

The percentage is highest in Satna where 74% of the respondents smoke bidis, followed by Niwari (58%), Rewa (54%), Panna (60%). Smoking is comparatively low in Umaria.

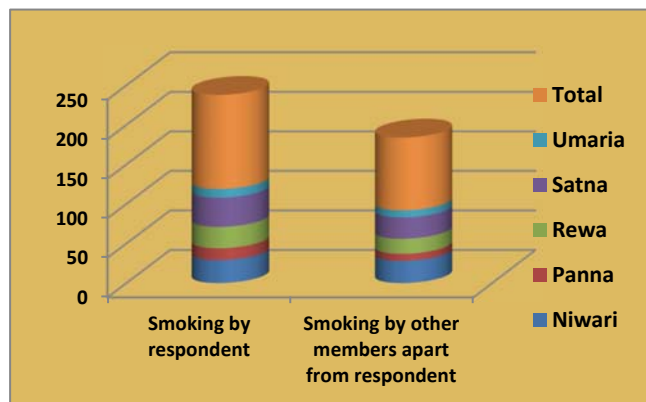


Figure 7.9 : Smoking Status

Apart from respondents, 37% other family members are observed, smoking bidis. The percentage goes out the same way where Satna stood highest and Umaria falls to the last.

7.4.2. Bidi consumption

On an average 16.4 bidis are smoked ± 6 (SD) per day i.e. 10-22 bidis are consumed by any member per day. The respondents and members from surveyed HHs, consumed highest of all i.e. 23 bidis in a day followed by Satna (21) and Niwari (20). Panna and Umaria being the lowest have shown consumption of 9 bidis per head per day.

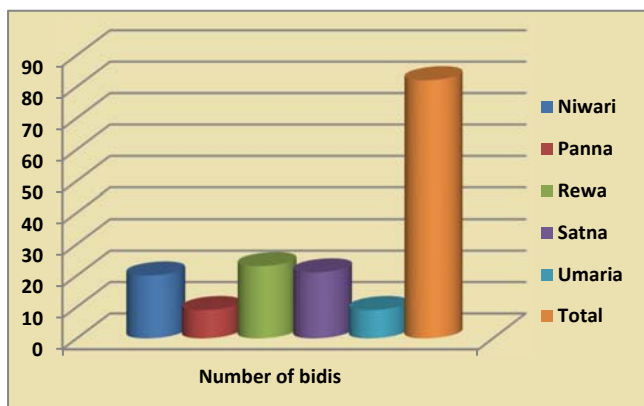


Figure 7.11 : Number of bidis smoked per day

7.4.3. Tobacco consumption

The tobacco is consumed by most of the members of the surveyed HHs. From the table, it is clear that on an average two members atleast consume any form of tobacco a day. This accounts to 1% of total surveyed population (137 people), which is involved in consuming gutka as well as bidis.

7.5. Prevention from Mosquitoes

Prevention from mosquitoes is too important to avoid the epidemic flow for malaria and dengue. Government is taking efforts in providing mosquito nets free of costs. The status observed in 5 districts below –

7.5.1. Mosquito nets

Table 7.10 and figures 7.11 and 7.12 indicates the prevention taking against mosquito bites. Mosquito nets are provided to 56% of total surveyed HHs. Amongst which, 100% of HHs from Panna own mosquito nets where as Satna and Umaria have 64% and 44% of HHs having nets at home against 36% and 34% of Rewa and Niwari HHs respectively.

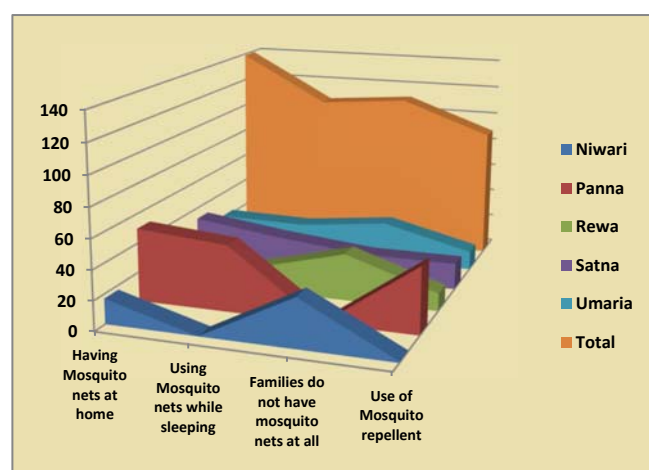


Figure 7.10: Availability and usage of Mosquito nets

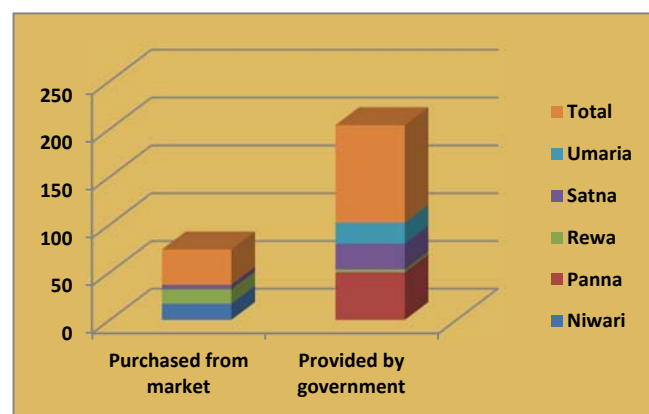


Figure 7.12: Source of Purchase

7.5.1.1. Use of Mosquito nets

Only 42% of total surveyed households use mosquito nets while sleeping. Maximum of which is recorded from Panna which shows 90% of its total HHs. Satna and Umaria comes next with 48% and 42% of HHs using nets at night.

Table 7.11: Prevention from Mosquitoes

Districts	Having Mosquito nets at home	Using Mosquito nets while sleeping	Purchased from market	Provided by government	Families do not have mosquito nets at all	Use of Mosquito repellent
Niwari	17	0	17	0	33	1
Panna	50	45	0	50	0	45
Rewa	18	16	15	3	32	12
Satna	32	24	5	27	18	18
Umaria	22	21	0	22	28	13
Total	139	106	37	102	111	89
%age	56%	42%	27%	73%	44%	36%
SS	250	250	139	139	250	250

7.5.1.2. Source of Purchase

27% of the 139 HHs (those have nets at home) has purchased this from market and 73% have been provided by government.

44% of the total Households do not own any nets and are not using them at all. The percentage comes high from Niwari, followed by Rewa where 66% and 64% of their total HHs devoid of this facility totally.

7.5.1.3. Use of mosquito repellents

Only 36% of total surveyed HHs from all the five districts have been using any kind of mosquito repellents. The percentage is high in Panna where 90% of its total HHs is aware of using repellents.

Satna with 36%, positioned at second most aware district. Rewa(24%) and Umaria (36%)have fairly low awareness in the population regarding repellents. Niwari stands last in terms of usage of any repellent at all.

8. Chapter Eight –Occupation, Landholdings and Agriculture

This chapter is chiefly segmented into land holdings by farmers, classifying them into big and small depending upon the size of land they hold, the agriculture availability and occupation of the families. This analysis is mixed of FGDs and in-depth interviews of key informants and detailed questionnaires

8.1. Landholdings

8.1.1. Availability of land

The land holdings are almost negligible in most of the families and is shown in Table and figures 8.1

Table 8.2 : Availability of Land

Districts	HHs with Land	%age	No land	%age	Total
Niwari	47	19%	3	1%	50
Panna	26	10%	24	10%	50
Rewa	31	12%	19	8%	50
Satna	23	9%	27	11%	50
Umaria	25	10%	25	10%	50
Total	152	61%	98	39%	250
%age	61%	0%	39%	0%	

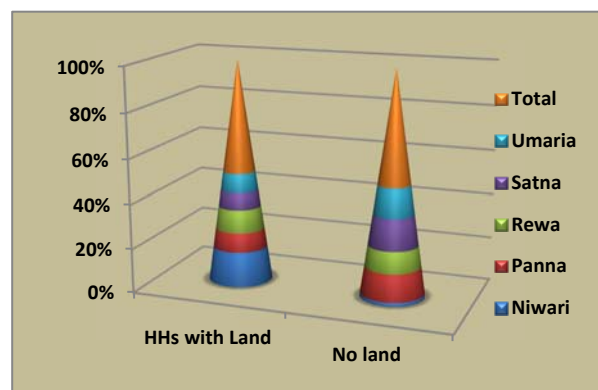


Figure 8.1: Landholdings

As shown 61% for total household surveyed are provided with some portion of lands against 39% families, those who are reported landless. The maximum percentage is recorded for Niwari where 47 households possess lands against 3 landless marks, making it 19% of the total.

It is followed by Rewa (31) where 62% of its total households have agriculture lands. The other districts including Panna, Satna and Umaria have more landless families than land holding ones

8.1.2. Land-size

Size of the land possessed by 152 families are discussed through Table and figures 8.2

Table 8.1 : Land-size

Districts	0.25 to 1 Acre	1.1 Acre- 2.9 Acre	3-5 Acres	More than 5 Acres
Niwari	11	18	19	2
Panna	31	6	8	5
Rewa	40	10	0	0
Satna	33	6	11	0
Umaria	33	6	9	2
Total	148	46	47	9
%age	59%	18%	19%	4%

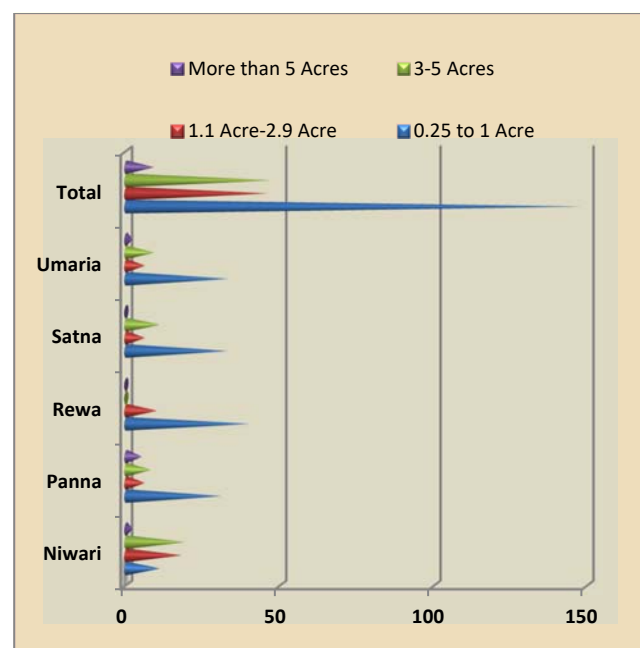


Figure 8.2: Size of Land

Quite obvious from the data shown in the above table, that 148 households have negligible lands or lands below than 1 acre which is necessarily not irrigated. 18% of the total households possess lands of about 2-3 acres similarly 19% of the households possess 3-5 acrs of land and only 4 % of the households are the bigger farmers and hold lands more than 5 acre.

Within districts maximum lands holdings are owned by households of Niwari about 12 % but that too between 1-2 acres.

Bigger farmers belong to Panna (3%) then 1 percent each from Niwari and Umaria

Medium farmers are mostly from Niwari (13%) followed by Satna (7%) Small farmers are also high in Niwari (12%) followed by Rewa (7%) then Satna, Umaria and Panna (4% each)

8.1.3. Land type

Based on the irrigation facilities land is categorized into two types- irrigated and rain-fed. The data is demonstrated in table 8.3 and figure 8.4

Table 8.3: Type of land

Districts	Total Land	%age	Irrigated	%age	Rain-fed	%age
Niwari	132	31%	33	8%	99	23%
Panna	122	29%	77	18%	45	11%
Rewa	54	13%	5	1%	49	12%
Satna	53	13%	20	5%	33	8%
Umaria	63	15%	23	5%	40	9%
All districts	424	100%	157	37%	266	63%

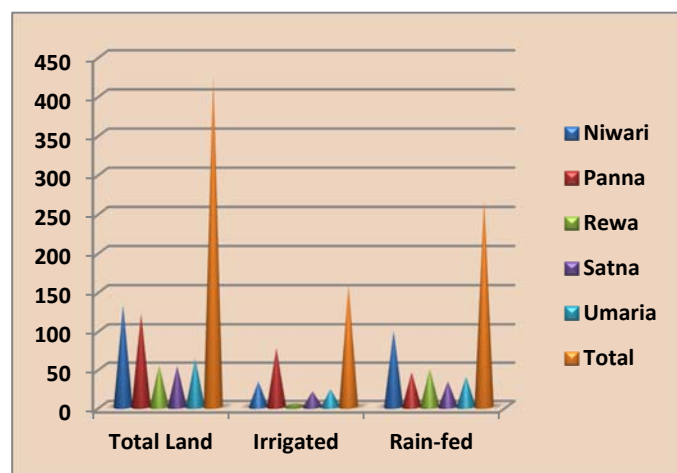


Figure 8.3 : Type of land

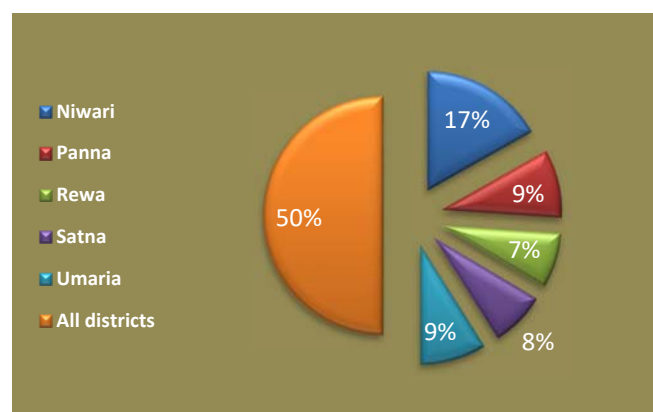


Figure 8.4: Distribution of Land within districts

The total land size acquired by surveyed household is computed to be 423 acres wherein 37% i.e. 157 acres of land is irrigated and 63% i.e. 266 acre of land is rain-fed.

This describes the picture of irrigation that the land which is to be reserved for proper irrigation is confined to less than half of the total land owned.

The maximum irrigated land is provided to the HHs of Niwari followed by Panna by 31% and 29% respectively, making a total 110 acre. Rest of the districts make out to 13-15% of total irrigated land

Distribution of land within district is illustrated through Figure 8.4 which states that maximum land is acquired by HHs belong to Niwari (34%) then Panna and Umaria (18% each) then Satna by 8% and Rewa by 7%

8.1.4. Average land size

Average land size is clear from the table 8.4 and figure 8.5. It shows the different average land size own by Households belonging to their respective districts

The average land size is computed as 3.03 acre per household for all the districts wherein, the maximum is computed for Panna i.e.4.67/HHs followed by Niwari (2.81 acres) , Rewa (2.56) and Satna (2.55 Acres /household)

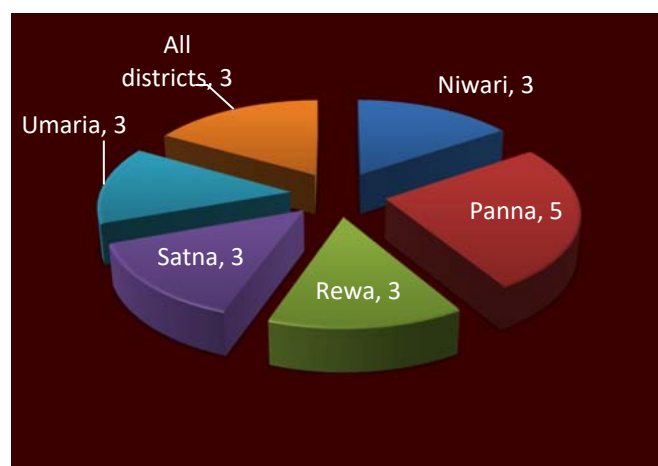


Figure 8.5 : Average land size

Table 8.4: Average land size

Districts	Number of HH possess land	Average land size per HH
Niwari	47	3
Panna	26	5
Rewa	21	3
Satna	21	3
Umaria	25	3
All districts	140	3

8.2. Occupation

8.2.1. Mode of occupation

The chief occupation and source of income for the community remain daily wages, labor, agriculture, conventional farming, and small shops, cattle-stock rearing to certain extent. It is explained through table 8.5 and figure 8.6

Table 8.5 : Occupation and source of Income

Districts	Niwari	Panna	Rewa	Satna	Umaria	Total
Salaried (Govt. or Private)	4	0	0	0	0	4
%age	2%	0%	0%	0%	0%	2%
Agriculture	47	21	4	28	27	127
%age	19%	8%	2%	11%	11%	51%
Wage labour	44	47	46	47	42	226
%age	18%	19%	18%	19%	17%	90%
Self employed/ business	2	0	1	0	0	3
%age	1%	0%	0%	0%	0%	1%

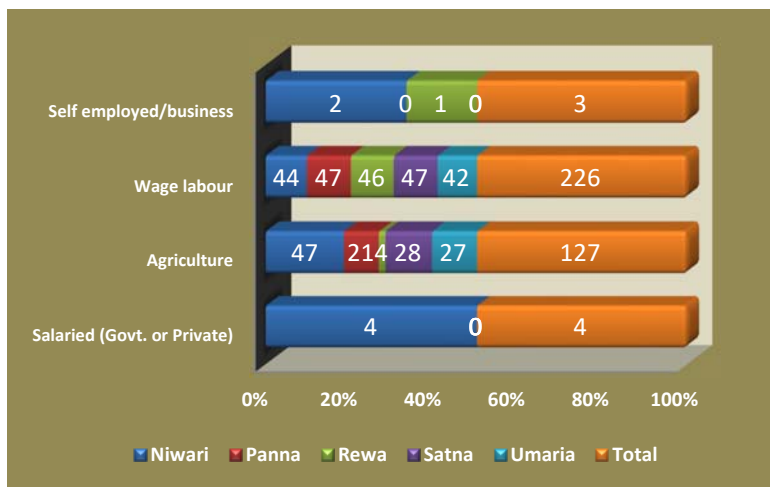


Figure 8.6: Occupation of Community

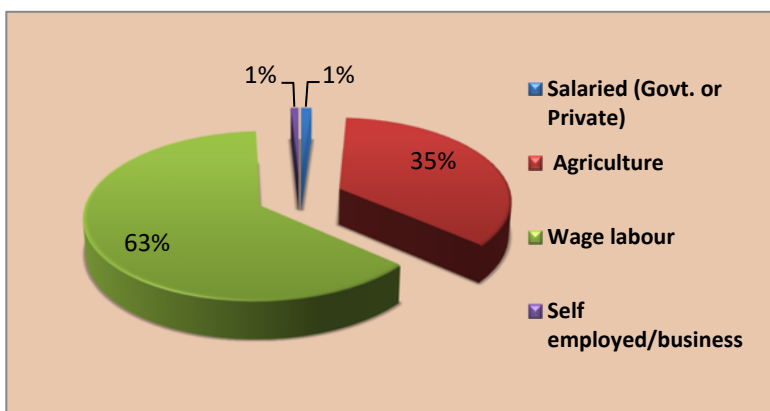


Figure 8.7: Source of income

It is clear from the table that main source of occupation for all the five districts is wage labor. Almost 90% of the households are doing daily wages for sustaining their life. As much as 51% of the household possess land and is involved in some sort of agriculture.

Merely 2% of the households either have salaried or private or government jobs and almost negligible percentage of households are self employed or have business.

Amongst the districts, all of those have 80-90% of households, those who are dependent on labor. As far as agriculture are concerned 19% of total households sustain through it. This is followed by Satna and Umaria where 56% of their total households are involved in agriculture

8.3. Source of income

Source of income is laid out in figure 8.7 which clearly shows that 63% of the source of income comes from wage labor whereas 35% is contributed by agriculture. About one percent each is contributed by business and private jobs

8.3.1. Households/families involvement in different sectors

The rural households meet food and income needs from collection of NTFPs, wage/labor earning, agriculture, business and other allied activities. Table 5.6 indicates that, all tribal households are traditionally involved in NTFPs collection. An average number of 86 households depend on this activity.

In addition, 171 families are also dependent on agriculture followed by 160 families who are involved in wage/labor earning. 15 families have business like owning some shops, kirana stores, tea-stalls, bhajia-stalls, small hotels or tailoring shop et cetera while 28 are either migrating to other place or involved in other services. Those who are involved in agriculture are simultaneously involved in other activities too. (Table 8.6)

Table 8.6 : Income from different sectors

Different Sectors	Number of Household	%age
Agriculture	171	68%
Labor	160	64%
NTFP collection	86	34%
Business	15	6%
Others	28	11%

8.3.2. Contribution of income from different sources to average household income

The main source of income is generated from agriculture to those who have lands and, labor to those who are landless. Agriculture contributes 35-50 percent of total income for the farmers. On average those who have lesser landholdings or no lands might have the income structure as shown in Table 8.7

Table 8.7 : Income generated in a year

Activities	Income generated / HH/ Year	%age
Agriculture	4967	6.5%
Labor	25104	32.8%
NTFP collection	15530	20.3%
Business	8000	10.5%
Others	2000	2.6%
Migration	40518	53.0%
Total	96119	

Table 8.7 is composed of mean of all the incomes generated via different sources to an average household in rural setting including agriculture, labor, NTFP collection, business and migrations. The mean and SDs of all the incomes are calculated and computed together to generate the income structure. (The detailed tables are placed in Annexure)

8.3.2.1. Migration

The income generated through migration is INR 40518 for those who have been migrating and it frames the 53 percent of total income. Thorough details of migration are covered in Section-8.4 of this chapter.

8.3.2.2. Wage/Labor

After migration the primary source of income is wage or labor only. Wage earning generates 32.8 percent of total income accounts to 25104 INR (based on the mean of 3000 INR per month for all the five districts. The villagers are dwelled mostly in agriculture labors, construction works, farming, or employed under other lands. Few cases under MNREGA reported, wherein, once in a while they get employment opportunities.

8.3.2.3. NTFP Collection and commercials

The NTFP at present is the only major source of income generation for the villagers after labor. It generates as much as 15530 INR (computed as mean for all the five districts as shown in table 8.7 for different NTFPS). NTFPs income is however important though it contributes to 23.4% of total income that is averaged out to 1500-1600 INR per

household per month. NTFP details are covered in details in section 8.5 (Table)

8.3.2.4. Agriculture

The table depicts that income generated from agriculture is confined to INR 4967 per households per year (on account of mean of all the crops and harvest on yearly basis, after calculating the profit and loss. For detail refer annexure).

Agricultural production in the region tends to be quite low in few villages because of lack of irrigation, and poor soil quality. With the small farms and low production, most households grow crops primarily for home consumption.

8.3.2.5. Other sources

In villages like Amdi, obri kaina and pajanpura, the good source of income is generated from business like kirana shops and general stores as much as 10-15000 per year contributing to 15-20 % of total income generated in a household.

Other sectors, like Labor (10.81%) and other services and allied activities (5.4%) are also important income generating activities.

8.4. Migration Pattern

The migration pattern as recorded during study is tabulated and figured in Table and figure 8.8

8.4.1. Migration Degree

The degree of migration as observed from all the districts are averaged out to 45% of total households participated in the study i.e. 114 from 250.

The highest pattern of migration is recorded in Panna where 75% of families are recorded to have been observing migration, followed by Rewa (42%) and Satna (40%). Niwari and Umari with 35% recorded the least of all five districts.

8.4.2. Migration pattern

The maximum migration pattern is recorded during November to January and June to August. Month wise migration trend is displayed in figure 8.8. All the districts have shown the similar fashion. One or two members from the family or sometimes, it is whole family that migrate to nearby towns or far away districts.

Two trends have been reported – short term migration and long term migration. In former cases, the distance is nearest to the villages and is followed for 2-3 days or on daily basis provided the distance from the native. In later case the families or members establish themselves in the destination for a period of three months. People migrate after Dussehra to Makarsankranti and after summer till onset of Monsoons.

Table 8.8 : Migration Pattern

S N	Local Name	Migration Status	No. Of studied HH	No. Of HH observed Migration	%age	Short term Migration duration	Long term migration duration in months	Frequency/ Year	Period	Short term places	Long term places	Employment s involved in	Short term Earning	Long term earnings per duration /month	Saved for home use	Total money saved in a year for home use
1	Niwari	Present	50.0	17.5	35%	daily or 2-3 days	3	Twice	Oct-Jan and June-Aug	Barua Sagar, Jhansi	Delhi, Gurgaon	Stone rushers, Factories, Construction work	2000	11000	8000	48000
2	Panna	Present	50	38	75%	daily or 2-3 days	3	Twice	Oct-Jan and June-Aug	Pathhar khadan pawai	Delhi, gurgaon, Chandigarh	Labor, construction, Factory	2000	12000	7000	42000
3	Rewa	Present	50	21	42%	daily or 2-3 days	3	Twice	Oct-Jan and June-Aug	Shankargarh, Shrirajpur	Delhi, Surat, Rajkot, Bombay	Labor, construction, Factory, Steel Plants, Mills	2000	12000	8000	48000
4	Satna	Present	50	20	40%	daily or 2-3 days	3	Twice	Oct-Jan and June-Aug	Chitrakoot, Satna, Jabalpur	Delhi, Haryana, Rajasthan, Maharashtra	Construction, Marble factories, Mills, Stone crushers	2000	10000	75000	45000
5	Umaria	Present	50	18	35%	daily or 2-3 days	3	Twice	Oct-Jan and June-Aug	Katni, Maihar, Satna	Delhi, Bombay, Rajatsthan	Construction, Factories, Catering	2000	12000	8500	51000
All			250	114	45%		3	Twice					2000	11400	7800	46800

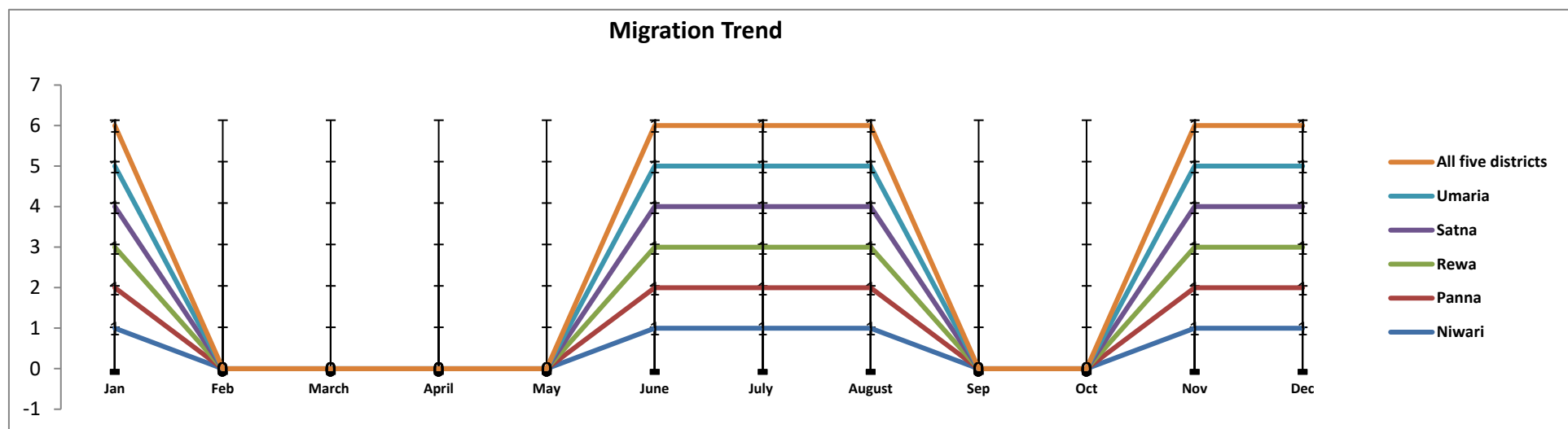


Figure 8.8 : Month-wise migration trend

The districts preferred are Delhi, gurgaon, Bombay, Rajkot, Surat, Jaipur, Kota etc.

8.4.3. Occupation and earnings

The main occupation during migration is reported as construction, labor, employment in mills and factories, steel pants or even catering.

The earnings derived from work during migration calculated out to 10-12000 INR a month and for a period of 6 months it is computed as 66000 out of which 73% is saved for home use i.e. 48000 INR. Earning patter is demonstrated in figure-8.9

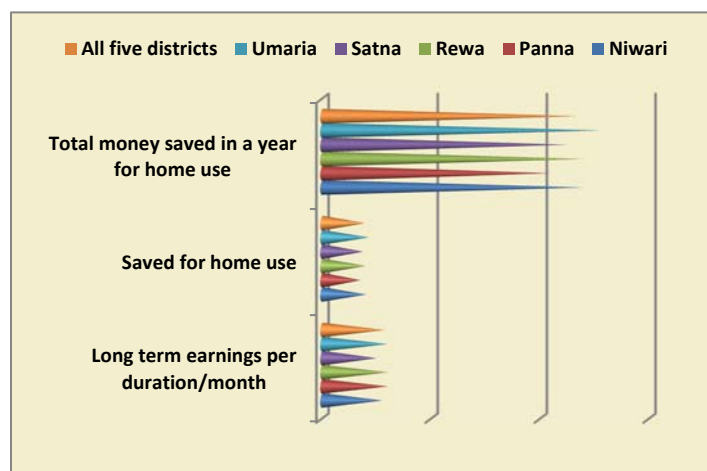


Figure 8.9 : Earning pattern and home use

8.5. NTFP Collection Pattern

Non-Timber Forest Produces play a crucial role in Household economy and consumption of the foods derived from forest especially in rural areas within and around forest areas. NTFPs become the main source of livelihood to those who are living deep inside the forests due to the lack of agricultural land and industrial activities. However, the production of NTFPs has varied across regions and asons.

8.5.1. Products Collected

There are number of forest produce those have been collected by the village dwellers during different period of the year, some are value added to increase its selling price and some are sent out raw. Point-wise below-

The purpose of collection, however, varies from one village to another. For example, those communities that are located within the forest collect large amounts of NTFPs mostly to fulfil their household needs. For instance, communities residing in Pajanpura of Niwari Kota Gunjapur and Kurad of Panna; Obri of Rewa; Khairwar of Satna and

Mardari of Umaria, are mostly dependent on forest produce for their day to day basic needs.

They collect different types of green vegetables available in the forest depending on the seasons like chirota ki bhaji in monsoon, sags in winter, gulli, mushrooms, aonla are collected in abundance. On the contrary, villages like Kaina of Niwari, Gahwai of Rewa, Amdi of Umaria and Devlaha of Satna are situated little far from forest and has lesser dependency on NTFPs comparatively.

According to the study the major NTFP collected in the study area are Tendupatta leaves, Mahua Flowers, to certain extent Achar; aonla and gums of Dhawda and Kullu, Bel, gulli, Chirota Sag (vegetable). Details of NTFPs collected are shown in Table 8.10

Many of Non Timber Forest Produces (NTFP's) are being used by locals for the improvement of their livelihood status like collection of Tendua and Mahua is done during summer and is sold in the local markets; these include leaves, flowers, fruits, branches, gums/resins, roots. The different parts of the NTFPs collected are shown in Table 8.9

Table 8.9 : Edible parts collected of NTFPs

SN	Local Name	Parts Collected	Use of NTFPs
1	Chroli	Seeds/Leaves	Edible
2	Mahua	Flowers/Seeds	Edible, Liquor making
3	Bel	Fruits	Edible, Medicinal, Industrial use
4	Aola	Fruits	Edible, Pickle Making
5	Tendu Patta	Leaves	Sale
6	Chirota	Leaves	Edible
7	Mushroom	Fruit	Edible
8	Ber	Frui	Edible
9	Bamboo	Stem	Home
10	Achar	Fruit	Edible

8.5.2. Contribution to Household Economy

The contribution of NTFP sale to the household economy is almost 20%. The incomes from NTFP collection and sale come at awfully critical time of the year when availability of wage labor opportunities are at their lowest ebb. Mahua, Bel, Gulli, Aonla and Tendu leaves are collected for sale and contribute as highest as 19200 INR to 11700 to household economy in a year. Highest is recorded for Rewa and lowest comes from Niwari.

Table 8.10 : NTFP Collection Pattern and Economy

SN	Local Name	Mahua	Tendupatta	Aonla	chiraunji	Bel	Guli	Total
1	Seasonal Availability	Summer	Summer	Winter	Monsoon	Winter	Winter	
2	Commercial Importance	✓	✓	✓	✓	✓	✓	
3	Household Importance	✓	✓	✓	✓	✓	✓	
4	Multiple use of the product	✓	✓	✓	✓	✓	✓	
5	Monetary value	45	250	50	500	25	30	
6	Unit	1 kg	100 Packet	1 kg	2 kg	1 kg	1 kg	
7	Total collected (kgs)	150Q	50	100	5	10	50	345
8	Home Use (kgs)	50.0	0.0	20.0	0.5	2.0	25.0	98
9	Sold (kgs)	100.0	30.0	80.0	4.5	8.0	25.0	248
10	Money earned/HH(INR)	4500	7500	4000	2250	200	750	19200
11	Availability Status -							
i	Niwari	4500.0	0.0	4000.0	2250.0	200.0	750.0	11700
ii	Panna	4500.0	7500.0	4000.0	0.0	0.0	750.0	16750
iii	Rewa	4500.0	7500.0	4000.0	2250.0	200.0	750.0	19200
iv	Satna	4500.0	7500.0	0.0	2250.0	0.0	750.0	15000
v	Umaria	4500.0	7500.0	0.0	2250.0	0.0	750.0	15000
12	Total mean	4500.0	6000.0	2400.0	1800.0	80.0	750.0	15530

A household collects maximum upto 4000-5000 of tendu leaves in a year that is sold for INR150 for 100 leaves making an income of 7500 INR from Tendu Leaves.

On the other hand, Mahua are sold at a rate of INR 45-50 per 1 kg making an income of 4500-5000 INR for 1 Quintal of Mahua collected by a household in an year.

Similarly, 100 kgs of aola is collected, sundried value added and are sold for 50 per kilograms thus profiting upto 4000.

Chiraunji to the contrary are collected least of all. Only 4-5 kilograms are sold in the market for 400-500 making a total of 2250 inr.

Guli (mahua flower) is collected heartedly for production of oil which is extensively being used by the family. Contribution to economy is low though i.e. 750 for only 25 kgs in a season.

It is worth mentioning that availability of NTFPs has declined and is unsure due to continuous decrease in the production major NTFPs in the recent past decades.

8.5.3. Value Added process

Undoubtedly with such less production, there is no room left for the processing of the available NTFP, still villagers maintain to add values to the whatever available quantity of few NTFPS to add up to its market value.

In few villages like Obri, gadhwai, kota gunjapur, devlaha, khairwar, mardari, Mahua flowers are processed in order to make liquor. They are dried before being consumed or sold. They are consumed as food as well as distilled to obtain country liquor. The households often collect mahua flowers in quantities larger than what they can store safely for a long period of time. As the storage capacity is limited, mahua flowers are sold at Rs 40-50 per kg during the collection season, only to be bought back from the local traders at a much higher price of Rs 90-100 per kg.

Similarly the villagers at Obri, devlaha mardari, amdi also do processing with amla collected seasonally before selling them out in the market to add on its market price. Almost 4-5 quintals of Amla is collected, stored and dried each season. Likewise Bael fruit is also collected before they are ripened and sun dried before sending them to market.

8.6. Agriculture Insight

8.6.1. Types of crops

Based on the discussion, questionnaire and interviews it is predicted that there are two types of crops predominantly rotated round the year – Rabi and Kharif crops

8.6.1.1. Rabi Crops

The rabi crops are sown around mid-November, preferably after the monsoon rains are over, and harvesting begins in April / May. The crops are grown either with rainwater that has percolated into the ground, or using irrigation

The major rabi crop in India is wheat, followed by barley, mustard, sesame and peas. Peas are harvested

early, as they are ready early: Indian markets are flooded with green peas from January to March, peaking in February.

8.6.1.2. Kharif Crops

The kharif season varies by crop and region, starting at the earliest in May and ending at the latest in January. In India the season is popularly considered to start in June and to end in October. Kharif crops are usually sown with the beginning of the first rains during the advent of the south-west monsoon season, and they are harvested at the end of monsoon season (October-November).

Paddy, maize, bajra, jowar, ragi, pigeon pea, green gram, black gram, soybean, guar, cow pea, groundnut, castor, cotton, sugarcane, turmeric, chilly, bitter gourd, bottle gourd, sponge gourd, brinjal

The types of rabi and kharif crops are explained in Table 8.6 and 8.7 and figure 8.8

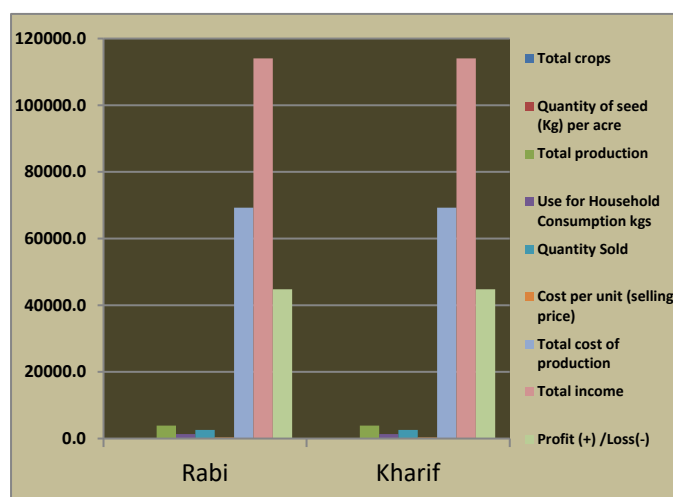
Table 8.11 : Details of Rabi and Kharif crops

SN	Type	Rabi	Kharif	Both
1	Total crops	11.0	11.0	22
2	Quantity of seed (Kg) per acre	225.0	225.0	450.0
3	Total production	9750.0	11370.0	21120.0
4	Use for Household Consumption kgs	4305.0	3937.0	8242.0
5	Quantity Sold	5445.0	7433.0	12878.0
6	Cost per unit (selling price)	767.0	1106.0	1873.0
7	Total income	266300.0	396825.0	663125.0
8	Total cost of production	195820.0	189665.0	385485.0
9	Profit (+) /Loss(-)	79610.0	207160.0	286770.0

As presented in table 8.6 and 8.7, 11 types of crops are reported to have been growing in the studied districts under both the rabi and kharif seasons. The major crops found under *kharif* are *kakun bajra, moong, udad, arhar, peanuts, corn, jowar, soyabean and rice* whereas under rabi the main crops found are *arsi, sesame, rai, matri, masri, chana, sarso, jawa, kodo kutki and wheat*.

As presented in table 8.6, the total production for all the five districts is accounted to 21120.0 Kilograms (211.2 Quintals) for an acre. Out of which, 46% is contributed by rabi and 54% comes from Kharif crops. The total household consumption is computed as 8242 kilograms from all the harvests under both types of crops wherein, 52% from Rabi and 48% from Kharif are used for HH consumption. Out of the total production 20% from rabi and 19% from Kharif crops are kept for HH consumption

Figure 8.10 :Details of Rabi and kHarif crops



On the other hand the total quantity sold is 12878 kgs, wherein 42% are sold from rabi and 58% from Kharif crops

Also from the total production, 26% is rabi and 35% is kharif, which is sold in the market. The total earning on the total production for all the five districts is calculated as INR 663125 for 1 Acre where as total production cost is computed as 385485.2 INR and profit earned is 277639.8 INR.

Mean cost of all the major crops under both types are explained in the table below. For detailed cost analysis for each district refer Annexure

SN	Food Items	Food Categories	Type	Quantity of seed (Kg) per acre	Total production	Use for Household Consumption kgs	Quantity Sold	Cost per unit (selling price)	Total cost of production	Total income	Profit (+) /Loss(-)
1	Kakun	Millet	Kharif	2.0	30.0	20.0	10.0	18.0	1540.0	180.0	-1360.0
2	Bajra	Millet	Kharif	3.0	93.3	43.3	50.0	32.0	4075.3	0.0	-4088.0
3	Moong	Pulses and Legumes	Kharif	4.5	137.5	15.0	122.5	48.0	6583.8	6877.5	293.8
4	Bajra	Millet	Kharif	7.0	200.0	50.0	150.0	16.0	4126.0	0.0	-4126.0
5	Udad	Pulses and Legumes	Kharif	5.3	236.0	38.0	198.0	40.8	5749.0	7112.0	1363.0
6	Arhar	Pulses and Legumes	Kharif	9.5	237.5	126.3	111.3	39.3	5575.0	2151.3	-3423.8
7	Peanuts	Nuts and Oil seeds	Kharif	30.0	300.0	20.0	280.0	35.0	7850.0	9800.0	1950.0
8	Corn	Millet	Kharif	4.0	300.0	250.0	50.0	12.0	7180.0	600.0	-6580.0
9	Jowar	Millet	Kharif	8.8	362.5	140.0	222.5	16.5	5215.0	50925.0	45710.0
10	Soyabean	Pulses and Legumes	Kharif	8.4	750.0	10.0	740.0	41.5	10650.0	28585.0	17935.0
11	Rice	Cereals	Kharif	16.3	1250.0	625.0	625.0	24.8	10706.3	7800.0	-2906.3
12	Arsi	Nuts and Oil seeds	Rabi	3.1	40.0	40.0	0.0	40.0	4050.0	0.0	-4050.0
13	Sesame	Nuts and Oil seeds	Rabi	2.5	140.0	12.4	127.6	53.0	4650.0	6616.0	1966.0
14	Rai	Nuts and Oil seeds	Rabi	9.9	200.0	125.0	75.0	30.0	8992.5	2500.0	-6492.5
15	Matri	Pulses and Legumes	Rabi	5.1	215.0	40.0	175.0	37.5	3665.0	0.0	-3230.0
16	Masri	Pulses and Legumes	Rabi	11.3	346.7	38.3	308.3	36.7	7485.0	11583.3	9225.0
17	Chana	Pulses and Legumes	Rabi	27.8	360.0	106.0	254.0	41.6	9536.0	7070.0	-2466.0
18	Sarson	Nuts and Oil seeds	Rabi	8.1	400.0	133.3	266.7	33.3	10395.0	55500.0	45105.0
19	Jawa	Millet	Rabi	40.0	500.0	100.0	400.0	15.0	4880.0	0.0	-4880.0
20	Kutki	Millet	Rabi	8.0	800.0	800.0	0.0	40.0	4660.0	0.0	-4660.0
21	Wheat	Cereals	Rabi	60.0	880.0	500.0	380.0	16.8	11281.0	4440.0	-6841.0
22	Kodo	Millet	Rabi	10.0	1000.0	1000.0	0.0	60.0	4300.0	0.0	-4300.0

Table 8.12 : Production details of crops and harvests

9. Chapter Nine – Women Empowerment/ Gender Perspective

9.1. Head of the Households

Table and figure 9.1 demonstrate the status of gender of Households as observed from the studied strata .

Table 9.1: Head of the Household

Districts	Female head	Male	Total
Niwari	3	47	50
Panna	25	25	50
Rewa	4	46	50
Satna	2	48	50
Umaria	5	45	50
Total	40	211	250

As shown, 16% of the households are headed by women amongst which 100 percent belong to ST community.

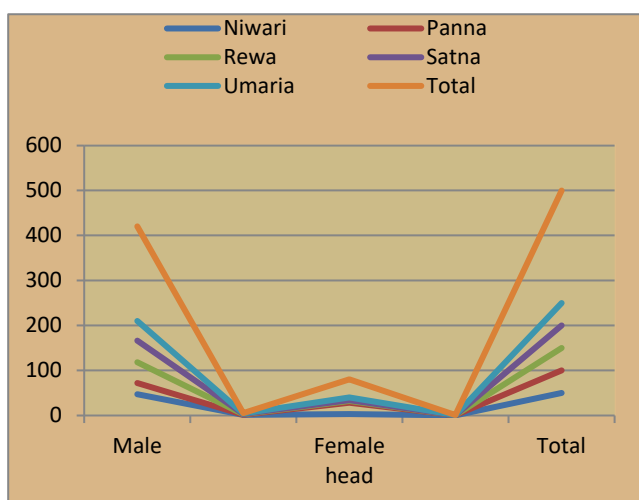


Figure 9.1 : Head of the Household

Within districts, the highest percentage is shown by Panna where 50% of its total households are headed by women. The least is shown in Satna where only 4% are headed by women against 6% in Niwari

9.2. Ownership

9.2.1. Ownership of House

The status of women if they own the house or if it belongs to male members is delineated through Table and figure 9.2

As table and figure predict, 12% of the total surveyed household are owned by women and 2% of the total household have the joint membership against 86% of male ownership. In districts Panna shows the highest trend of about 30% of its total households are owned by women

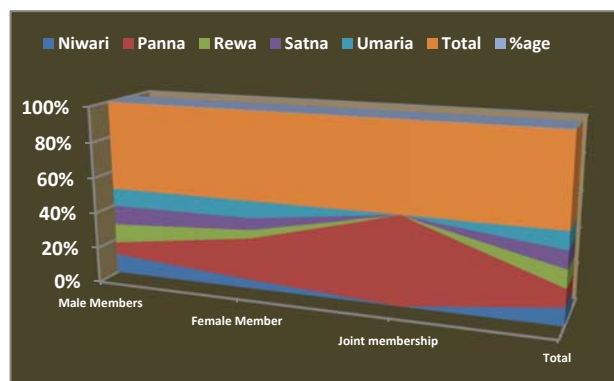


Figure 9.2 : Ownership of House

Table 9.2: Ownership of house

Districts	Male Members	Female Member	Joint membership	Total
Niwari	35	4	9	48
Panna	15	1	10	26
Rewa	29	3	0	32
Satna	20	1	0	21
Umaria	21	2	2	25
Total	120	11	21	152

9.2.2. Ownership of Land

On a similar pattern the ownership of land possessed by community is analyzed and recorded in Table and figure 9.3

Table 9.3: Ownership of land

Districts	Male Members	Female Member	Joint membership	Total
Niwari	47	3	0	50
Panna	31	15	4	50
Rewa	47	3	0	50
Satna	46	4	0	50
Umaria	44	6	0	50
Total	215	31	4	250
%age	86%	12%	2%	100%

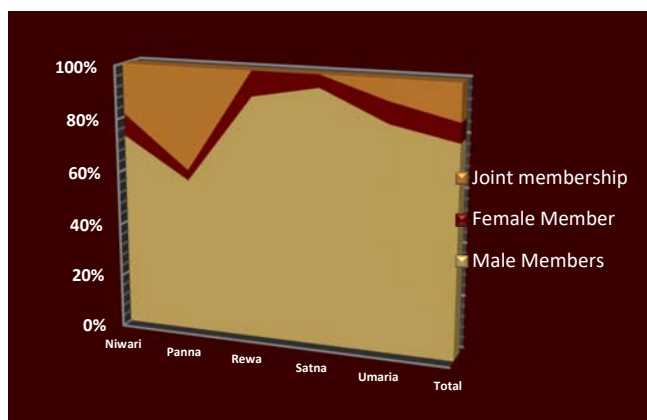


Figure 9.3: Ownership of land

Table and figure show that 79% of land ownership is in the name of male members but still 7% of the women sparingly from Niwari and Rewa has comparative better hand on ownership of land against 14% those who possess land equally with their male counterpart

9.2.3. Ownership of Accounts

Also the bank account details are analyzed from gender perspective and presented in table 9.4 and figures 9.4 and 5

Table 9.4: Ownership of Bank accounts

Districts	No of male members have bank ac	No of female members have bank ac	Total number of members	Number of households female have accounts
Niwari	65	41	106	32
Panna	58	14	72	14
Rewa	61	26	87	14
Satna	84	58	142	37
Umaria	100	96	196	47
Total	368	235	603	144
%age	147%	94%	241%	58%



Figure 9.5: Ownership of Bank accounts

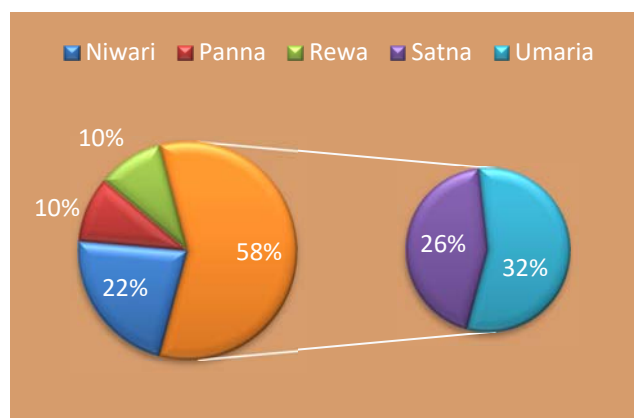


Figure 9.6 Households female have accounts

17% of total members is reported i.e. 235 against 368 male members. Amongst the districts that have shown highest mark of women having bank accounts are Umaria (38% of its total members) followed by Satna (18%) and Niwari (15%)

Similarly those households have been analysed where atleast one female member have an account. It is observed 58% of total surveyed households have atleast one female members bank account. Within district, Umaria has recorded the highest percentage of such households (94%) followed by Satna 74%

9.3. Members of SHG group (Self - made status)

The women who have started out Self-help group is a step ahead on their social and economical progress. Such households are analyzed where at least one woman, is either a member or have started SHGs. Status displayed through Table 9.4 and figure 9.5

20% of Households that is 49 Households from 250 have at-least one SHG members. The largest figures come from Panna where 46% of the household have SHG members, followed by Niwari (32%) The least come from Satna (6%) and Umaria (4%). Rewa has 10% of households having SHGs members

Table 9.5: SHG Membership status

Districts	Female members as SHG member	%age
Niwari	16	32%
Panna	23	46%
Rewa	5	10%
Satna	3	6%
Umaria	2	4%
Total	49	20%

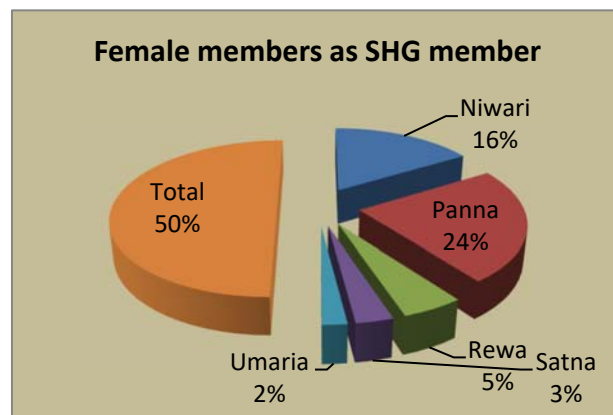


Figure 9.7: SHG member status

9.4. Decision-making power

The decision making power comes to play the powerful role in according the purchasing power related to food items, major decision of home. The data is illustrated in Table 9.6 and figure 9.7

Table 9.6 : Decision making power

Districts	Male	Female	Both	Total
Niwari	45	5	0	50
Panna	26	24	0	50
Rewa	33	8	9	50
Satna	39	8	3	50
Umaria	16	5	29	50
Total	159	50	41	250
%age	64%	20%	16%	100%

As suggested 20% of the households have decision making power in women's hand against 64% of those who have male decision makers. 16% of such households have also been recorded (41/250) where joint decision is taken by both male and female members. The highest is recorded from Panna where 48% of the decisions are taken by female members.

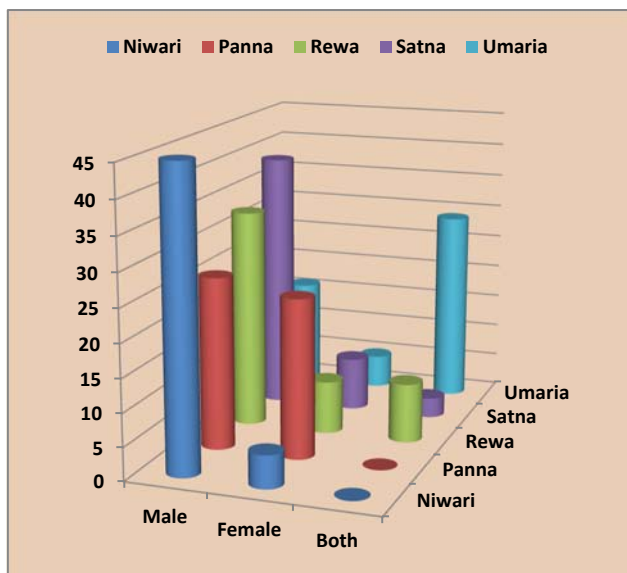


Figure 9.8: Decision-making power

The tribe represented the villages are Gond. It is evident that women lead not even holds the lands, houses but take decisions also.

Other districts including Rewa and Satna stand second with 16% each, where women are decision- makers.

Umaria stands out where 58% of the households are making decisions with mutual consent of both males and females

II. Subsection Two – Profile of Community IPLAs (Infant, Pregnant and Lactating Mothers, and Adolescents) (Based on In-depth Questionnaire)

10. Chapter Ten – Demographic Characteristics (IPLA)

10.1. Demographic Classification of Infant and Children

Based on hundred in-depth questionnaire administered to 20 children (10 from each group – 0-6 months and 6-24 months) from each districts, demographic classification is illustrated in Table and Figure 10.1

Table 10.1 : Demographic classification

Districts	Scheduled Tribes	Scheduled Caste	OBC
Niwari	7	3	10
Panna	16	4	0
Rewa	17	3	0
Satna	20	0	0
Umaria	15	5	0
Total	75	15	10
%age	75%	15%	10%

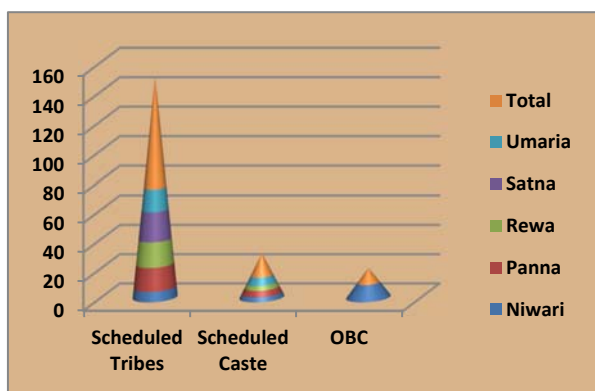


Figure 10.2 : Demographic classification

Seventy five percent of the total population for group infants, surveyed, belongs to Scheduled tribes followed by 15% of Scheduled caste and 10% of other backward classes.

Amongst the districts, Satna has 80% of STs, followed by Rewa (68%), Panna (64%) and Umaria (60%). Very few children come from ST (28%) from Niwari. Sampled population constitutes 10% of OBCs which comes from Niwari as 50% of its sampled population comprises of OBCs only.

10.1.1. Age wise distribution

The age wise distribution is reflected in Table 10.2 and figures 10.2 and 3

Forty-one percent of the total children interviewed, 41% belonged to 1-6 months whereas 25% of the total surveyed population for infant and children belong to 7-12 months of age group against 15% of those comes under 13-18 months and 16% those from 19-24 months.

Table 10.2: Age group of sampled children population

Districts	< 1 months	1-6 months	7-12 months	13-18 months	19-24 months
Niwari	1	8	7	1	3
Panna	0	8	6	1	5
Rewa	0	10	5	4	1
Satna	1	6	5	5	3
Umaria	1	9	2	4	4
Total	3	41	25	15	16
%age	3%	41%	25%	15%	16%

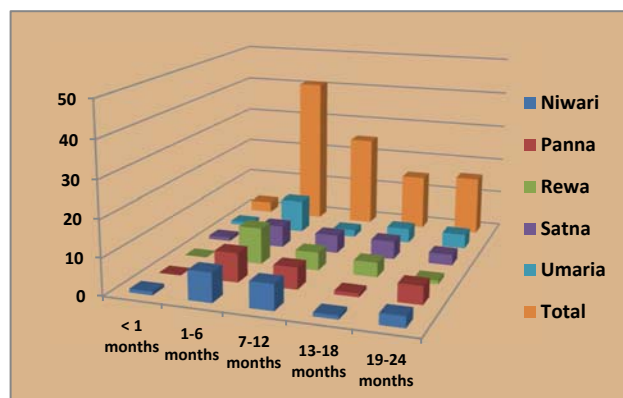


Figure 10.1 : Age group of sampled children population

Within districts, the maximum population belongs to 1-6 months of age followed by 25% that comes under 7-12 months of age.

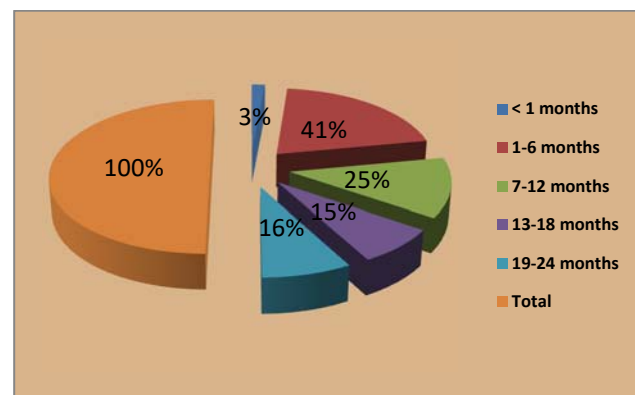


Figure 10.3 : Percentage of age-wise distribution

10.1.2. Gender wise distribution

The gender wise distribution of the sampled population of both groups – infants (0-6 months) and children (6-24 months) is demonstrated in Table 10.3 and figure 10.4

Table 10.3: Gender-wise distribution

Districts	Male	%age	Female	%age
Niwari	10	50%	10	50%
Panna	13	65%	7	35%
Rewa	10	50%	10	50%
Satna	7	35%	13	65%
Umaria	6	30%	14	70%
Total	46	46%	54	54%
%age	46%		54%	

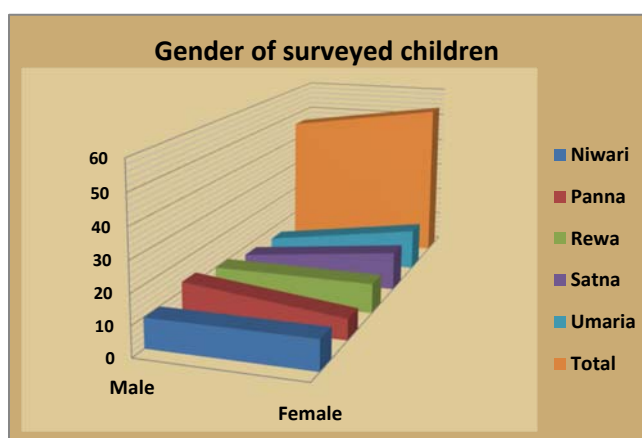


Figure 10.4 : Gender-wise distribution

Looking to the data, it is deduced that, 54% of children in both age groups are females against 46% males. These figures are considered for good female to male ratio amongst the tribal belt of the studied population and is accounted to 1080/920 Female to male ratio.

The trend is similar in all the districts except for Panna where %age of male gender is double than female one i.e. 65% males against 35% females

10.2. Demographic classification of PLAs

10.2.1. Census Classification of PLAs

The age group of both Pregnant, lactating and children's (7-24 months) mothers participated in the interviews, is broadly classified into 20-25 years, 26-30 years and 30+ years and is presented in table and figure 10.4

Table 10.4 : Population distribution of IPLAs

Districts	Pregnant mothers			
	ST	SC	OBC	Total
Niwari	4	6	0	10
Panna	9	1	0	10
Rewa	10	0	0	10
Satna	10	0	0	10
Umaria	6	4	0	10
Total	39	11	0	50
%age	39%	11%	0%	50%
Districts	Lactating mothers			
	ST	SC	OBC	Total
Niwari	3	5	5	13
Panna	8	2	0	10
Rewa	10	0	0	10
Satna	10	0	0	10
Umaria	9	1	0	10
Total	40	8	5	53
%age	40%	8%	5%	53%
Districts	Adolescent			
	ST	SC	OBC	Total
Niwari	3	4	3	10
Panna	9	1	0	10
Rewa	9	1	0	10
Satna	10	0	0	10
Umaria	7	3	0	10
Total	38	9	3	50
%age	38%	9%	3%	50%
SS	100	100	100	100

As the table narrates, 39% of the total sampled PLA population is pregnant and belongs to ST, rest of the 11% of pregnant women comes from SC families.

Similarly 40% of the total sampled PLA population ($n=150$) are lactating mothers from ST families and 8% from SC families whereas only 5 from OBC families.

Equivalently, 38% of adolescent comes from ST, 9% of total surveyed PLA population comes from SC families and 3% from OBCs.

Not a single pregnant woman was interviewed from OBC families. Distribution of population within different categories within districts follows the same linear trend i.e. 80-90% from ST against 10-15% from SC except for Niwari, where 30% of respondents are each of STs and SCs and 40% from OBCs.

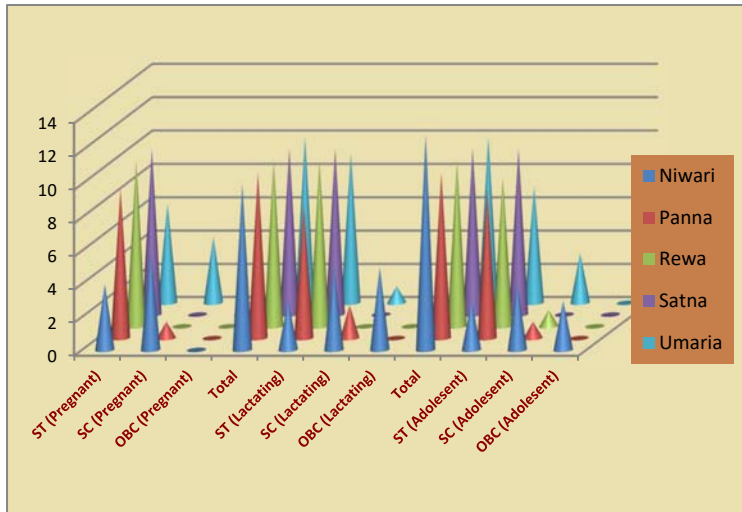
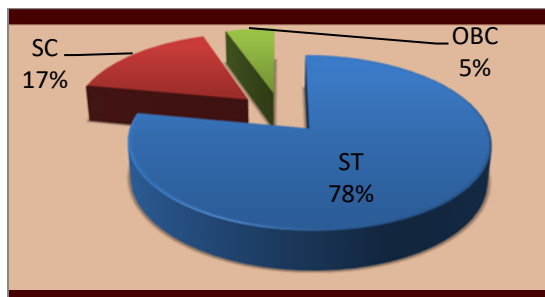


Figure 10.5: Census classification of PLAs

As clear from Table 10.6 and figure 10.5, the maximum distribution of the population is attained by Scheduled tribes

Table 10.5: Distribution of population

	ST	SC	OBC
Pregnant	39	11	0
Lactating	40	5	5
Adolescent	38	9	3
Total	117	25	8
%age	78%	17%	5%
SS	150	150	150



in all the categories – Pregnant, Lactating mothers and Adolescent girls; then by Scheduled Caste and very low by OBCs by 78%; 17% and 5% respectively.

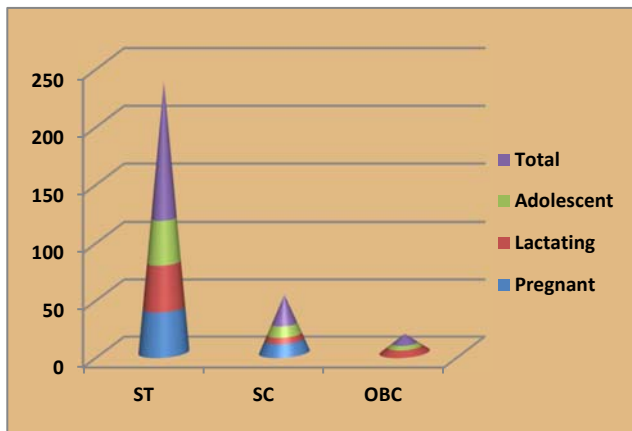


Figure 10.6: Distribution of population

10.2.2. Age-wise distribution

Age wise distribution of PLAs is described in Table 10.7 and figure 10.7

Table 10.6: Age-wise distribution

Districts	Pregnant mothers			
	20-25 Y	26-30 Y	30+ Y	Total
Niwari	9	1	0	10
Panna	2	8	0	10
Rewa	9	1	0	10
Satna	6	3	1	10
Umaria	7	3	0	10
Total	33	16	1	50
%age	17%	8%	1%	25%
Districts	Lactating mothers			
	20-25 Y	26-30 Y	30+ Y	Total
Niwari	9	0	1	10
Panna	5	4	1	10
Rewa	6	4	0	10
Satna	7	2	1	10
Umaria	9	1	0	10
Total	36	11	3	50
%age	18%	6%	2%	25%
Districts	Child's(7months-24 months) mother's age			
	20-25 Y	26-30 Y	30+ Y	Total
Niwari	9	0	1	10
Panna	5	4	1	10
Rewa	6	4	0	10
Satna	7	2	1	10
Umaria	9	1	0	10
Total	36	11	3	50
%age	18%	6%	2%	25%
SS	200	200	200	200
Districts	Child's(12-13 years-14-18 years) mother's age			Total Adolescent
	12-13 Years (Adolescent)	14-18 years (Adolescent)	Total Adolescent	
Niwari	3	7	10	
Panna	2	8	10	
Rewa	1	9	10	
Satna	1	9	10	
Umaria	10	0	10	
Total	17	33	50	
%age	9%	17%	0	
SS	200	200	200	

Based on the interviewed children, the mother's age is classified in three age groups i.e. 20-25 years; 26-30 years and 30 + years whils for adolescents, it is classified into two groups only 12-13 y and 14-18 year

As the table suggests all the mothers belong to ST frames the largest population segment i.e. 17% for each group (Pregnant, Lactating and mothers of children), comes under 20-25 years of age making a larger ratio of young mothers. The second largest group comes under 25-30 years of age and comprises of 20% of total population wherein 6% each of Pregnant and Mothers of children and 8% of lactating women. A very few women from all the three categories represented under 30+ age group.

The trend holds true for all the districts as well except for pregnant women from Panna. 80% of the pregnant women from Panna come under age group of 25-30 y of age.

Observation checkpoint : This is a checkpoint of child marriage and early pregnancy also.

In case of adolescent girls, 34% of the total adolescent girls have just entered the puberty and comes under 12-13 years of age against the major chunk of 66% of total adolescent girls (17% of total sampled PLAs) belong to older adolescents.

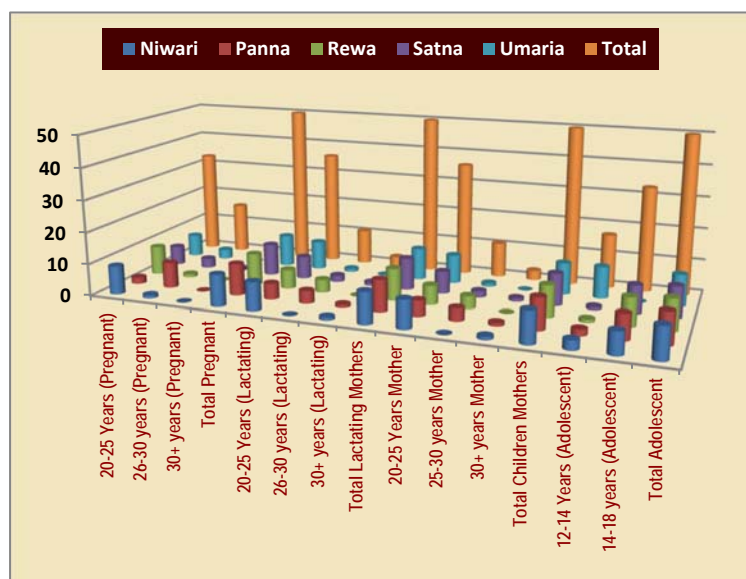


Figure 10.7: Age-wise distribution

10.2.2.1. Mean age of PLA

The mean age of all the categories of PLAs is illustrated in Table 10.7

Table 10.7 : Mean Age and its SD for all groups

	Pregnant	Lactating	Ado-lescent	Mothers of children 7 mo-24 mo
Mean	24	24	16	25
SD	3	4	2	4

It states that at any point of time for the given period, in any of the five districts, the age of pregnant woman would be 24 with SD ± 3 i.e. the pregnancy age would range from 21-27 years and same would be true for lactating mothers also. In

case of mothers of children aged 13 months to 24 months would be 25 with ± 4 i.e. the age for mothers of children more than years would range from 21-29 years

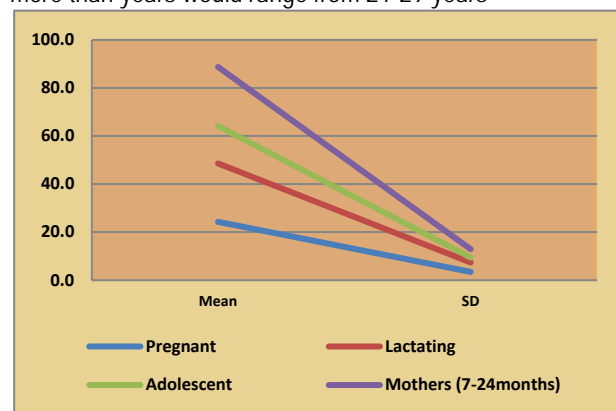


Figure 10.8: Mean Age

10.2.3. Trimester-wise distribution of Pregnant Mothers

The trimester wise distribution of pregnant mothers participated in the interviews is ostended in Table 10.8 and figure 10.9. It limns that only 4 % of pregnant women is observing their 1st trimester against 36% of those who are observing their 2nd trimester. Majority of the interviewed pregnant mothers (60%) have entered the third trimester of their pregnancy, in most of cases 8th or 9th month.

Table 10.8 : Trimister wise distribution

Districts	1st Trimester	2nd Trimester	3rd Trimester
Niwari	1	4	5
Panna	1	2	7
Rewa	0	7	3
Satna	0	3	7
Umaria	0	2	8
Total	2	18	30
%age	4%	36%	60%

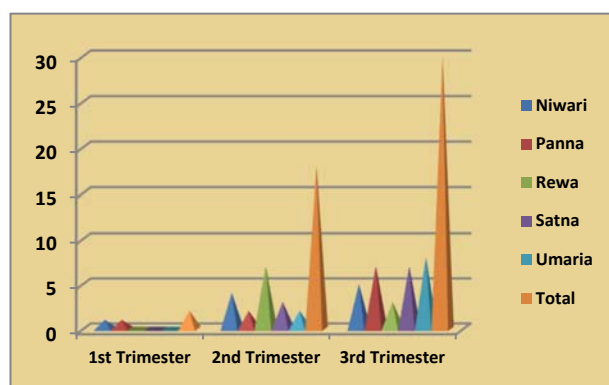


Figure 10.9: Trimester wise distribution

Observation checkpoint :

This is a checkpoint of early registration of pregnancy. In most of the cases in rural setups, women are mostly hesitant to announce their pregnancy causing late registration and thus affecting overall health

11. Chapter Eleven – Maternal Health and Practices (IPLA)

This chapter covers the health scenario as observed in the fields and is practiced by the IPLA group.

11.1. Visit to Anganwadi Centers

Angwandi centres typically portrays its term into real action where angan means courtyard and in rural setting angan is a place where community people meet to socialize. Thus it symbolizes as a unit to connect rural with ICDS schemes. Visiting the centers regularly inculcates at least few good and health practices focusing on supplementary nutrition, immunization, health checkups referral etc,

The practice by mothers, children and Adolescent in the five districts is pictured through Table and figure 11.1

Table 11.1: Visit to AWCs

Districts	Pregnant	Lactating	Ado-lescent	Total
Niwari	10	10	10	30
Panna	10	8	10	28
Rewa	6	7	5	18
Satna	10	10	5	25
Umaria	10	10	10	30
Total	46	45	40	131
%age	31%	30%	27%	87%

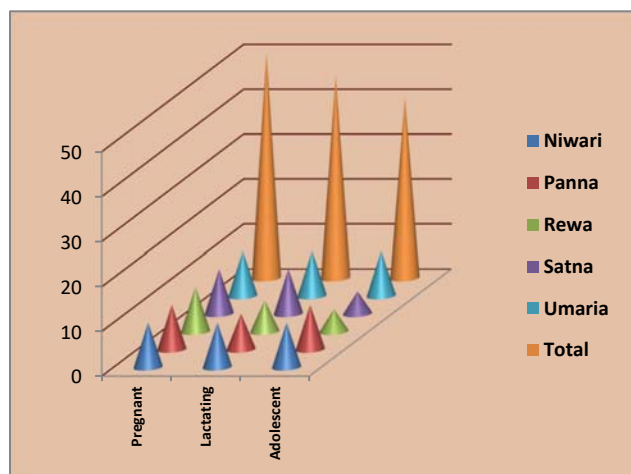


Figure 11.1 : Visit to AWCs

As interpreted from the table that, 87% of the total IPLA group visits AWCs. Amongst which 31% Pregnant mothers, 30% Lactating mothers and 26% Adolescent visit Anganwadi centers whenever is required.

Within districts, those are Niwari and Umaria, where 100% of the sampled population is reaching out to AWCs; then in Panna with 94% of population and Satna with 85%; contrary

to this, fairly low percentage (64%) of PLA visits Anganwadi centres in Rewa

Amongst the groups, pregnant mothers are more aware and particular for visiting AWCs.

The sole purpose found out during study in the fields for visiting AWCs have been the THR. The women and girls have shown interested in acquiring THR from AWCs, which is however in practice of consuming at once with entire family.

In Rewa, the situation of the village Obri was concerning the reasons for not visiting AWCs by groups due to unavailability of AWW at center and mostly closes down of centre.

The PLA group also mentioned that they have not received any THR, nor there any growth monitoring activities conducted; nor any distribution of IFA for last three months.

This affects the health of women in longer terms.

11.2. IFA Status

11.2.1. Consumption of IFA tablets

Iron Folic Acid consumption is covered in 11.2 and figure 11.2

Box 11.1: Why IFA Supplementation?

India is one of the countries with very high prevalence of anaemia in the world. Nutritional anaemia is a major public health problem in India and is primarily due to iron deficiency.

The National Family Health Survey-3 (NFHS-3) data suggests that anaemia is widely prevalent among all age groups, and is particularly high among the most vulnerable - nearly 58 per cent among pregnant women, 50 per cent among non-pregnant non-lactating women, 56 per cent among adolescent girls (15–19 years), 30 per cent among adolescent boys and around 80 per cent among children under 3 years of age and 70% below 5 years of age.

In young children, iron deficiency is due to increased iron requirement during periods of rapid growth. In addition, infant and toddler diets are often poor in bio-available iron, particularly post weaning. Children who suffer from anaemia have delayed psychomotor development and impaired performance; in addition they have 5–10 point deficit in intelligence quotient. Iron deficiency can cause significant central nervous system (CNS) damage even in the absence of anaemia. There seems to be a vulnerable period for these damages particularly between 9 and 18 months of age.

Ministry of Health and Family Welfare in 2013 launched “National Iron Plus Initiative” as a comprehensive strategy to combat the public health challenge of Iron Deficiency Anaemia prevalent across the life cycle. There are age specific interventions with Iron and Folic Acid Supplementation and Deworming for improving the haemoglobin levels and reducing the prevalence of anaemia for all age groups, that is children 6–59 months, 5–10 years, adolescent girls and boys (11–19 years), pregnant and lactating women and women in reproductive age group (20–49 years).

Source : Ministry of Health and Family Welfare

Table 11.2 : IFA Consumption

Districts	Pregnant	Lactating	Adolescent
Niwari	10	9	10
Panna	9	7	6
Rewa	10	6	1
Satna	4	10	3
Umaria	10	10	4
Total	43	42	24
%age	29%	28%	16%
SS	150	150	150

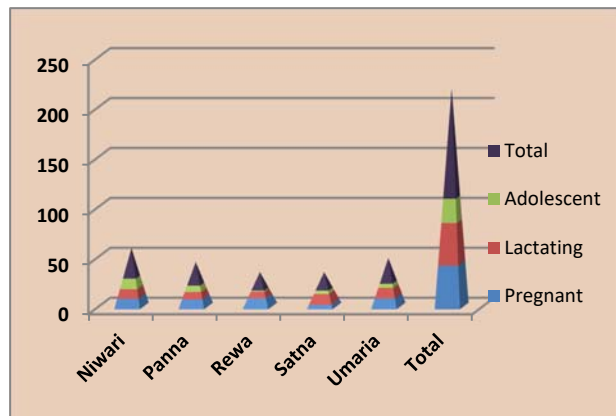


Figure 11.2: Consumption of IFA

Through table, status of IFA consumption is seen limited to 74% amongst total PLA group. IFA tablets are consumed only by 28% of pregnant and lactating mothers and 16% of adolescent girls.

However the percentage is fairly higher compared to overall status of MP where IFA consumption is merely 23.6%, but lower than entire country, which is 30.3

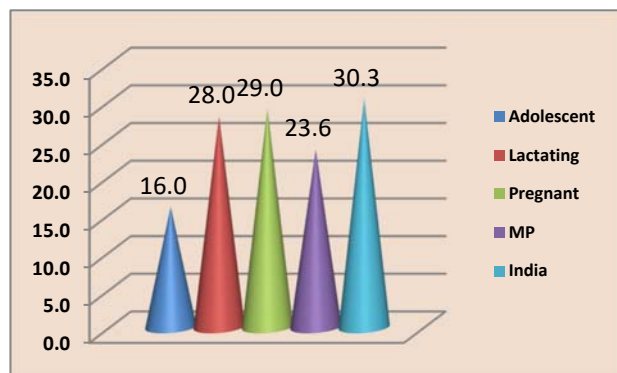


Figure 11.3 : IFA consumption compared with MP, India

Reasons for not consuming IFA tablets are recorded as the taste, color, dark stools, and constipation.

11.2.2. Frequency of IFA consumption

As interpreted from the table 11.3 and figure 11.4,

Table 11.4: Frequency of IFA

Districts	Once a day	Twice a day	Thrice a day	Do not consume at all
Niwari	20	6	10	0
Panna	2	14	5	2
Rewa	14	2	1	0
Satna	5	8	3	2
Umaria	6	12	4	1
Total	47	42	23	5
%age	31%	28%	15%	3%
SS	150	150	150	150

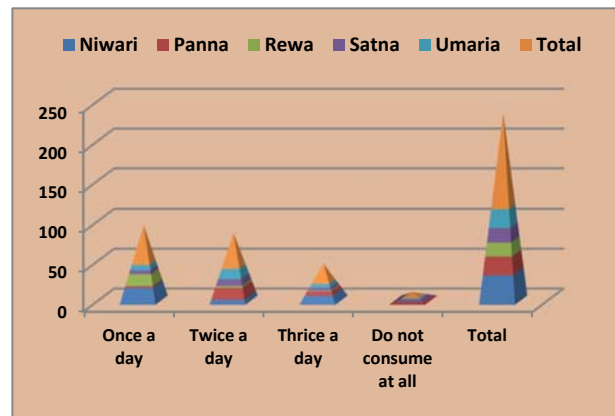


Figure 11.4: Frequency of IFA consumption

Table 11.3: Frequency of IFA

Districts	Once a day	Twice a day	Thrice a day	Do not consume at all
Niwari	20	6	10	0
Panna	2	14	5	2
Rewa	14	2	1	0
Satna	5	8	3	2
Umaria	6	12	4	1
Total	47	42	23	5
%age	31%	28%	15%	26%
SS	150	150	150	150

26% of the total population surveyed does not consume IFA at all, those who have been consuming are consuming as per their choices and not because of roper dosage they are advised to.

31% of the population is consuming it once a day where as 28% of the total sampled HHs consumes twice a day against 15% as consumed by woman three times a day.

The correct dosage however is one tablet a day for 100 days. The frequency of IFA is given in Annexure

11.3. Institutional Delivery Status

11.3.1. Institutional Delivery (ID) Rate

With striking rate of 221, MMR of MP asserts a different picture of maternal health in the state. Figure 11.6 takes us through the causes of the maternal death reports, wherein, the anemia and PPH (30%) majorly leads to MMR

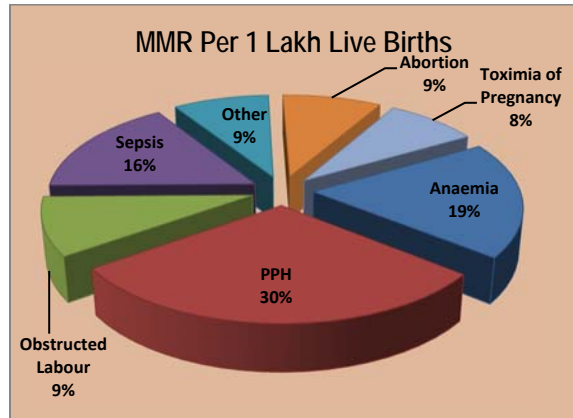


Figure 11.5 : Causes of MMR of MP

Post partum hemorrhage results from the improper care taken during deliveries chiefly due to lack of services required at the time of birth, thus in institutional deliveries trained healthcare professionals provide specific care and attention to newborn babies with special needs in order to improve their survival chances and reducing the risk of maternal mortality.

The institutional delivery as recorded from the field, is demonstrated in Table 11.5 and figure 11.6

Table 11.5: Institutional Delivery Status from Field

Districts	Institutional delivery	%age	Home	%age
Niwari	18	90%	2	10%
Panna	18	90%	2	10%
Rewa	16	80%	4	20%
Satna	20	100%	0	0%
Umaria	20	100%	0	0%
Total	92	92%	8	8%
%age	92%		8%	
SS	100		100	

As the data interprets, of 100 samples (50 infants and 50 children participated in the study), 92% had institutional deliveries.

Amongst the districts, Umaria and Satna recorded the striking highest institutional delivery rates i.e. 100% compared to other districts Niwari and Panna with 90% and Rewa with 80%.

The reasons for not reaching out to nearest CHCs, PHCs or District hospital from villages Panna and Rewa is the distance from the institution.

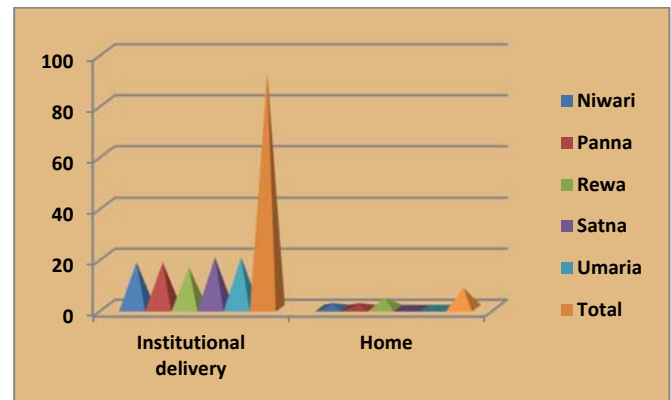


Figure 11.6: Status of institutional deliveries

The rates as observed from the field are comparatively higher than the entire state and nation (Figure 11.7). The highest of them is recorded for Umaria and Satna then all the five districts followed by Panna, Niwari, ahead from MP, Rewa and entire nation.

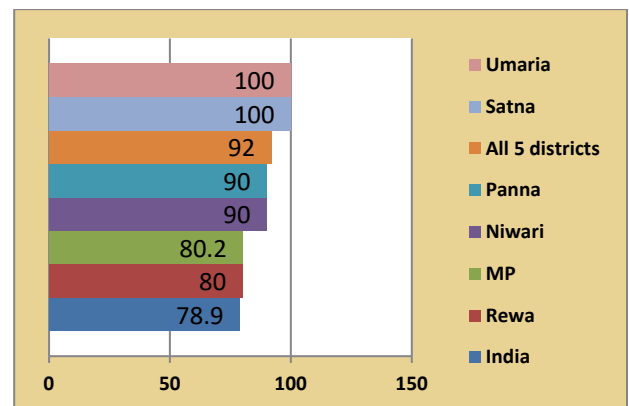


Figure 11.7: Comparison of Institutional delivery rates

Observation checkpoint :

This is a checkpoint of awareness status of institutional deliveries and field team orientation regarding the same. Alongside, the works of AWWs and ASHAs and ANMs should not to be overseen here.

11.3.2. Types of Hospital for ID

The types of hospitals community women reach out to as elucidated in table 11.6 and figure 11.8 profess that 60% of total deliveries (92% institutional + 8% home) took place in CHC, followed by 20% at District Hospitals and 12% in PHCs

Table 11.6: Types of Health centers preferred

Districts	CHC	District Hospitals	PHC
Niwari	18%	0%	0%
Panna	0%	18%	0%
Rewa	4%	0%	12%
Satna	20%	0%	0%
Umaria	18%	2%	0%
Total	60%	20%	12%

The nearest accessible health center to these villages remained CHCs majorly in Niwari, Satna and Umaria whereas, District Hospitals was nearest to Panna and PHC to Rewa villages.

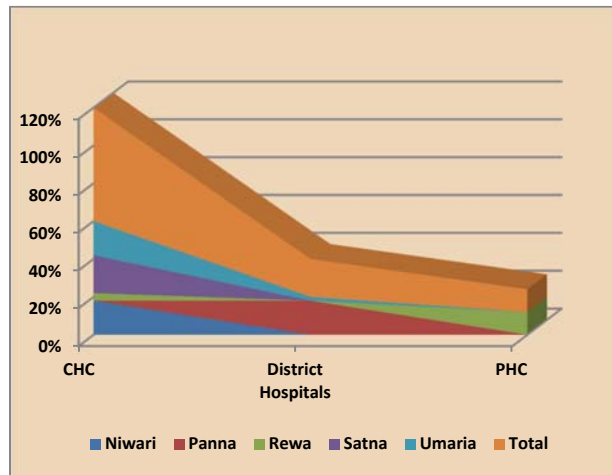


Figure 11.8: Types of Health centers preferred

Table 11.7: Meal Pattern/Frequency

Districts	Pregnant		
	2-3 Times (P)	4-5 Times (P)	6-7 times (P)
Niwari	8	2	0
Panna	8	2	0
Rewa	0	9	1
Satna	9	1	0
Umaria	2	7	1
Total	27	21	2
Districts	Lactating		
	2-3 Times (P)	4-5 Times (P)	6-7 times (P)
Niwari	2	6	2
Panna	8	2	0
Rewa	5	0	5
Satna	5	5	0
Umaria	7	2	1
Total	27	15	8
Districts	Adolescent		
	2-3 Times (P)	4-5 Times (P)	6-7 times (P)
Niwari	6	4	0
Panna	6	4	0
Rewa	0	8	2
Satna	8	2	0
Umaria	2	8	0
Total	22	26	2
Districts	Total		
	2-3 Times (P)	4-5 Times (P)	6-7 times (P)
Niwari	16	12	2
Panna	22	8	0
Rewa	5	17	8
Satna	22	8	0
Umaria	11	17	2
Total	76	62	12

11.3.3. Meal and Rest Pattern amongst PLAs

Meal and rest patterns are recorded for all pregnant, lactating and adolescent girls participated in the study where n =150, where 50 from each group and 30 from each districts

11.3.4. Meal Pattern

Based on the frequency the meals are consumed in a family by women and girls, the meal pattern is categorized into three groups –

1. Two-Three times
2. Four-Five times
3. Six- seven times

The meal consumption pattern as explained through, table 11.7 and figure 11.9, clears the picture of diet patterns of women and girls in the field. It states that the meal pattern is confined to 2-3 meals a day.

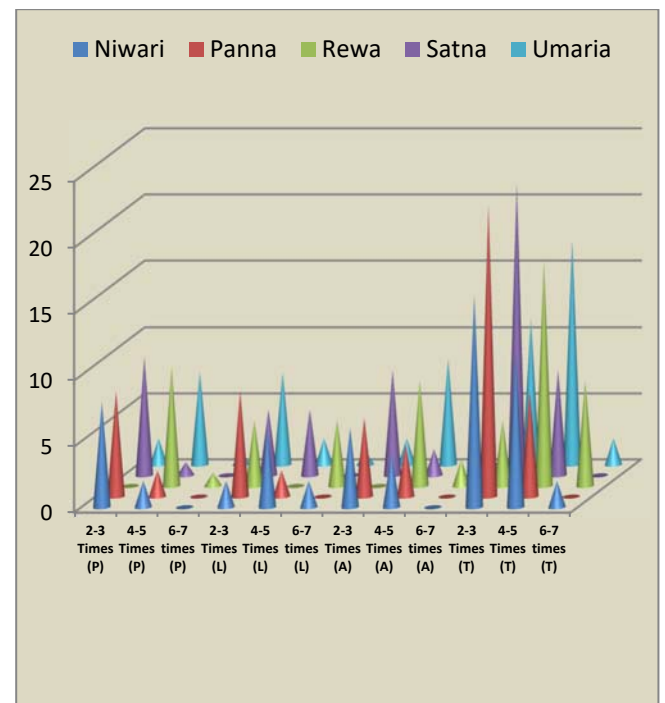


Figure 11.9: Meal Pattern

It is evident that half of the population consumes meals only twice a day out of which 72% are pregnant and lactating and 28% are adolescent. Amongst the districts, the maximum percentage recorded for Satna and Panna of about 44% each of their total population who consume food only twice or thrice a week.

About 41% of the population consume food around 4-5 times amongst which, 84% of pregnant and lactating women and 16% of adolescent are consuming 4-5 times meal a day. A very few percentage of about 8% are consuming means more than 6 times.

In totality, of all pregnant women 54% are consuming 2-3 times a day against 4% those are consuming more than 5 meals a day. This same trend is seen for lactating mothers also. However, the number of lactating mothers those are consuming more than 5 meals are more (8 out of 50) i.e. 16% of total population.

Adolescent girls on the other hand are consuming more than 5 meals a day (52%) against 4% those who have been consuming more than 5 meals

11.3.5. Rest Patterns

Rest patterns are reported to have been normal for the studied regions. More than 79% of the women and girls are reported to have been resting for a period of 2 hours. Amongst pregnant more than 44% is taking rest for two against 2% those who have been resting for more than two hours. 10% of total pregnant women are only resting for one hour. On the contrary lactating women are found taking lesser resting hours for about only 1 hour against 64% of them who have been taking naps for two hours. In adolescent 86% of total is taking rest for two hours. Of the

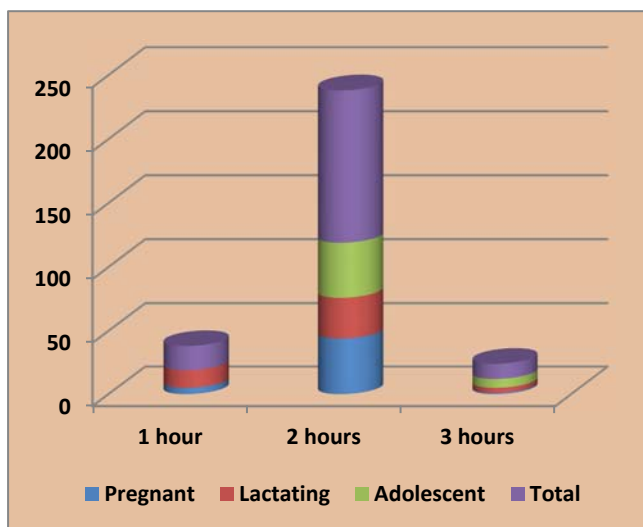


Figure 11.10: Distribution of resting hours

total population 13% only are resting for one hour

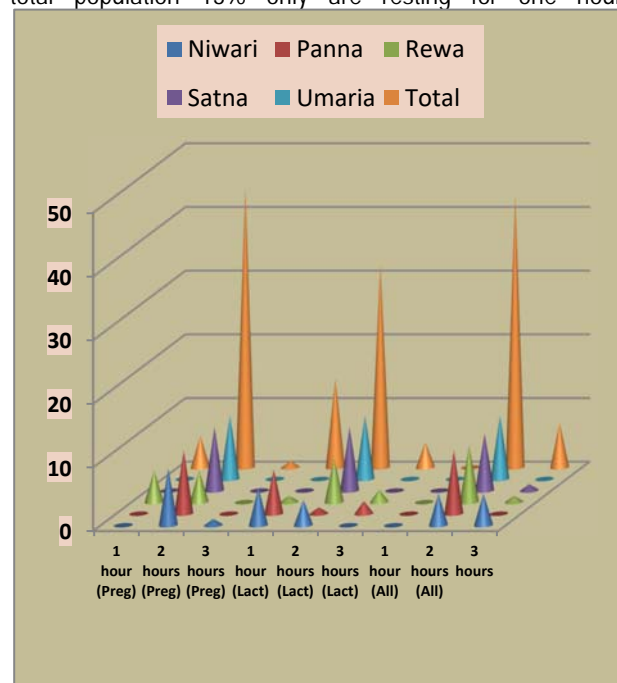


Figure 11.11: Rest Patterns

Table 11.8: Rest Pattern

Districts	Pregnant		
	1 hour	1 hour	1 hour
Niwari	0	9	1
Panna	0	10	0
Rewa	5	5	0
Satna	0	10	0
Umaria	0	10	0
Total	5	44	1
Districts	Lactating		
	1 hour	1 hour	1 hour
Niwari	6	4	0
Panna	7	1	2
Rewa	1	7	2
Satna	0	10	0
Umaria	0	10	0
Total	14	32	4
Districts	Adolescent		
	1 hour	1 hour	1 hour
Niwari	0	5	5
Panna	0	10	0
Rewa	0	9	1
Satna	0	9	1
Umaria	0	10	0
Total	0	43	7
Districts	Total		
	1 hour	1 hour	1 hour
Niwari	6	18	6
Panna	7	21	2
Rewa	6	21	3
Satna	0	29	1
Umaria	0	30	0
Total	19	119	12

12. Chapter Twelve – Infant Young Child Nutrition (IYCN) Practices

Breastfeeding is an unequalled way of providing ideal food for the healthy growth and development of infants; it is also an integral part of the reproductive process with important implications for the health of mothers. As a global public health recommendation, infants should be exclusively breastfed for the first six months of life to achieve optimal growth, development and health. Thereafter, to meet their evolving nutritional requirements, infants should receive nutritionally adequate and safe complementary foods while breastfeeding continues for up to two years of age or beyond. Exclusive breastfeeding from birth is possible except for a few medical conditions, and unrestricted exclusive breastfeeding results in ample milk production.

– World Health Organization

12.1. Early Initiation of Breast milk

WHO defines Provision of mother's breast milk to infants within one hour of birth is referred to as "early initiation of breastfeeding"

It is extremely important for establishing successful lactation as well as for providing "Colostrum" to the newborn. Ideally the new-born should receive the first breastfeed soon after the birth preferably within half an hour. As it is active during first one hour and may learn suckling fast. Early suckling speeds up the milk formation process, further early secretion and better milk flow.

Table 12.1 : Early initiation of breast-milk

Districts	Niwari	Panna	Rewa	Satna	Umaria	Total
Early Initiation within 1 hr	12	4	10	10	12	48
%age	60%	20%	50%	50%	60%	48%
Breastmilk between 1-2 hours of child birth	3	2	0	10	4	19
%age	15%	10%	0%	50%	20%	19%
Breastmilk after 2 hours	3	12	6	0	4	25
%age	15%	60%	30%	0%	20%	25%
Breastmilk after 5-6 hours	2	2	4	0	0	8
%age	10%	10%	20%	0%	0%	8%

The condition of early initiation of breastfeeding as observed from the field is shown in table and figure 12.1. It avows that only 48% of infant and children were breastfed within an hour (Early initiation of breastfeeding).

Contrary to which 19% were breastfed between 1-2 hours against 33% of infant and children who were breastfed after 4-5 hours.

Amongst the districts, Niwari and Umaria has better percentage of Early initiation of Breastfeeding with 60%, followed by Rewa and Satna with 50%. However Panna has really poor EIB rate i.e. 20% only

Comparison with NFHS4 data

Figure 12.2 shows comparison with NFHS-4 data on EIB wherein EIB rate for Panna lags behind than MP and India; contrary to all other districts wherein, the surveyed population showed better rate than entire state and nation

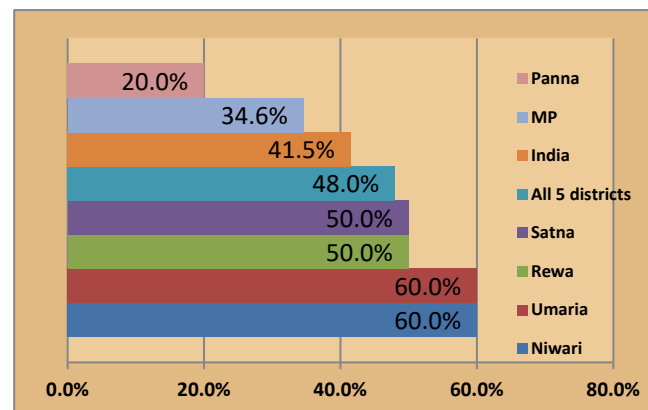


Figure 12.2 : Comparison with NFHS 4 Data

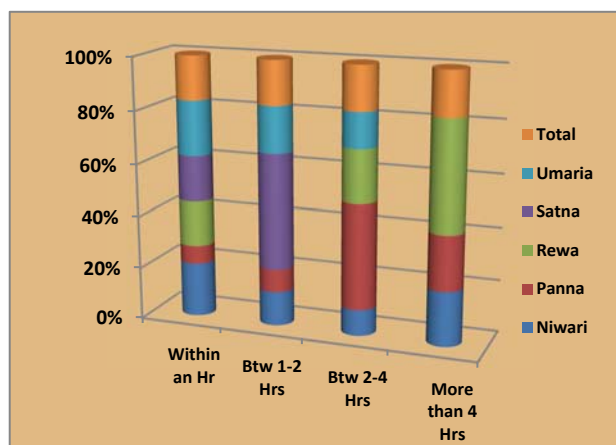


Figure 12.1: Early Initiation of Breast milk

12.2. Colostrums Feeding

The first milk, produced during end of pregnancy is yellowish, sticky breastmilk, highly enriched with nutritious element including the necessary micronutrients, antibodies and phytonutrients, is colostrums and should be given within an hour to ensure initiation of proper development of newborn's body right from the start.

Figure 12.3 shows the Colostrums feeding rate as interpreted from field, that 79 % of sampled population has provided their newborns with colostrums.

The highest within the districts is recorded for Niwari with 95% followed by Rewa (85%), Umaria and Satna (80%) and least in Panna (55%)

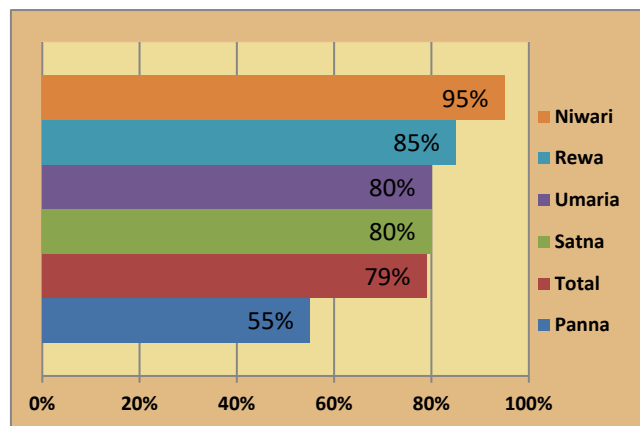


Figure 12.3 : Colostrums Feed Rate

Colostrums are however given in the cases where institutional delivery took place. Those who were asked for not giving the colostrums came up with the reasons that the first milk is impure and should not be given to child. Few suggested it is in their tradition that first milk to be given away to their deity

12.3. Exclusive Breastfeeding

"Exclusive breastfeeding" is defined as no other food or drink, not even water, except breast milk (including milk expressed or from a wet nurse) for 6 months of life, but allows the infant to receive ORS, drops and syrups (vitamins, minerals and medicines). – WHO

Table 12.2 : Exclusive Breastfeeding Status

Districts	Exclusive breast-feeding	%age	Breastfeeding less than 6 months	%age	Pre-lacteal feeds	%ages
Niwari	10	50%	1	5%	3	15%
Panna	8	40%	7	35%	10	50%
Rewa	10	50%	5	25%	5	25%
Satna	20	100%	0	0%	15	75%
Umaria	17	85%	3	15%	5	25%
Total	65	65%	11	11%	38	38%

Status of Exclusive Breastfeeding coming from field is illustrated in Table 12.2 and figure 12.3

As shown, exclusive breastfeeding is attained by 65% in total. However its best practice is seen in Satna where it is

followed by 100% except for pre-lacteal feed cases where in, women tend to give pre-lacteals but no other food. Umaria with 85% have better status of EBF then Niwari and Rewa (50%). The poorest of all is practiced in Panna where only 40% of the surveyed infant and children have received Exclusive Breast Feeding.

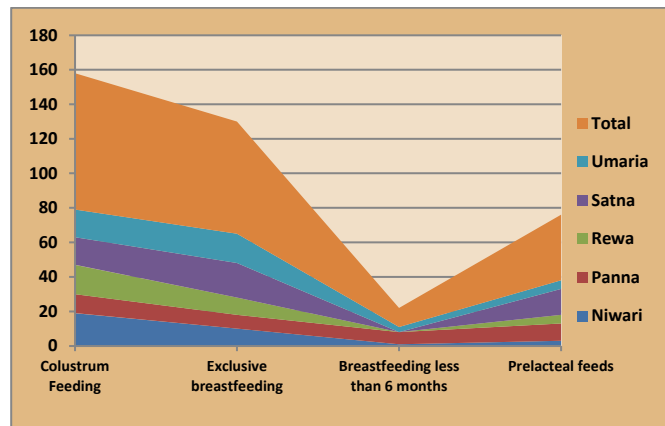


Figure 12.4: Exclusive Breastfeeding and Pre-lacteals

12.3.1. Pre-lacteal feeds

As depicted from table 12.2, 75% of mothers from Satna is providing pre-lacteal feed along with exclusive breastfeeding in the form of ghutti and honey only. The practice is prevalent in Panna (50%) and a very low practice is observed in Rewa and Umaria (25%) followed by Niwari with 15% only

12.3.2. Comparison with NFHS-4

As shown in figure 12.5, Rewa, Panna and Niwari lags behind from MP in EBF contrary to Satna and Umaria which has better EBF status.

The mean of 5 districts is somehow better than the EBF rates of entire country and MP as a whole.

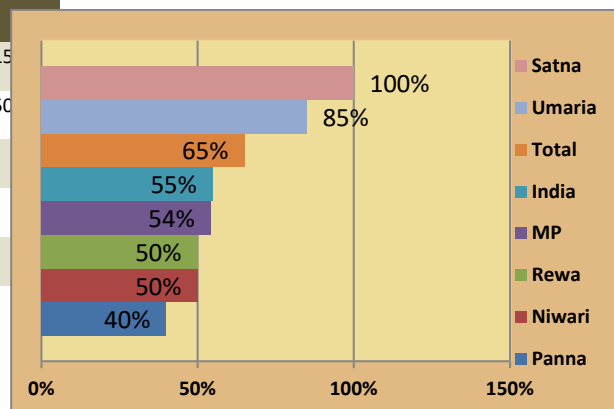


Figure 12.5 : Comparison with NFHS 4 data

12.4. Complimentary Feeding

Complementary feeding occurs when children receive foods to complement breast milk or infant formula. Ideally, it begins at 6 months of age and continues to 24 months or beyond, reflecting the World Health Organization's recommendations for exclusive and continued breastfeedings. In practice, however, in many cases exclusive breastfeeding ends earlier than 6 months and continued breastfeeding ends prior to the second birthday. The complementary feeding period occurs during a "window of opportunity" for the prevention of stunting and promotion of optimal growth, health and behavioral development - WHO

Table 12.3: Complementary feeding

Districts	Complimentary feeding	<6 months	6 months	> 9 months	Not giving at all
Niwari	10	1	9	0	0
Panna	7	0	7	0	3
Rewa	9	0	8	1	1
Satna	7	0	7	0	3
Umaria	10	3	7	0	0
Total	43	4	38	1	7
%age	43%	4%	38%	1%	7%

As represented in Table 12.3 and figures 12.6 and 12.7, 43% of the populations have reported to have been following complimentary feeding practices. 4% of the total sampled population of infant and children have received their first solid food before the age of 6 months.

Moreover, 38% of them have received it on the suggested time i.e. at 6 months of age. 7% of them have never received complementary feeding at all.

12.4.1. Comparison with NFHS-4 data

A comparison on data as derived from the field and NFHS-4 stats is presented in figure 12.8

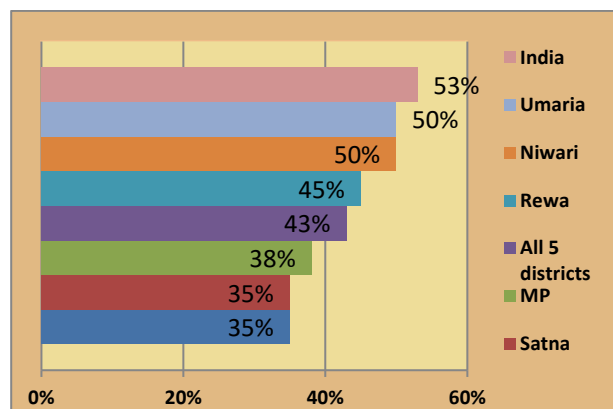


Figure 12.8 : Comparison with NFHS-4 data

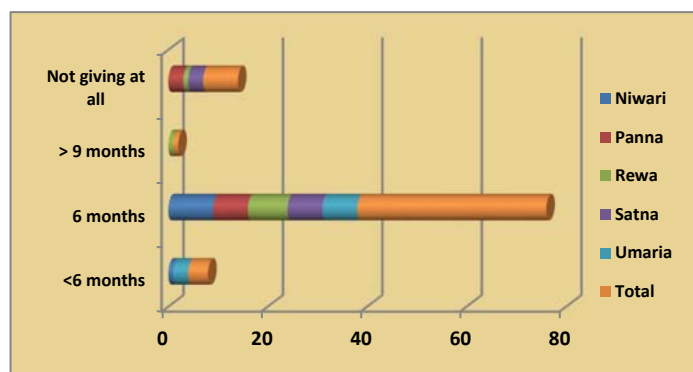


Figure 12.6: Complementary feeding during different ages

All the five districts lag behind in rate comparison with NFHS-4 from India (53%). Complementary feeding rate recorded in Satna is even lower than that of MP

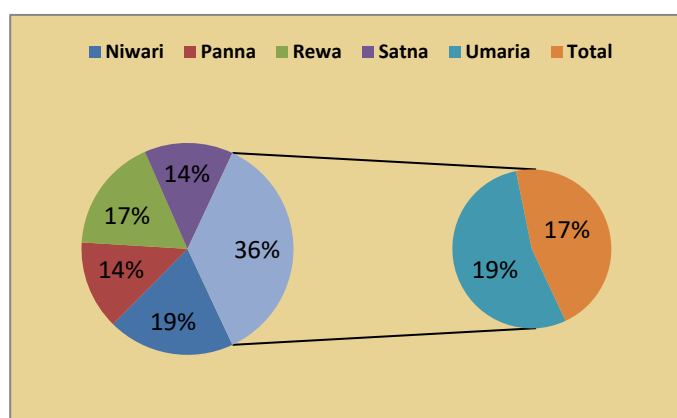


Figure 12.7 : Ratio of complimentary feedings

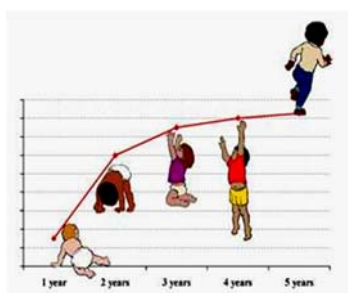
13. Chapter Thirteen – Height and Weight Measures (Growth Assessment)

Basic growth assessment involves measuring individual's weight and height or length (in case of infants), then comparing these measurements to growth standards. The purpose is to determine the nutritional status – underweight, over-weight or obese in case of adult.

For an infant or a child, it is done to check if it is growing "normally" or has a growth problem or trend towards a growth problem that should be addressed.

It involves –

- Measure weight, length, and height;
- Calculate body mass index (BMI)
- Plot these measurements on growth charts; and
- Interpret growth indicators.



13.1. Child Growth Measures

Following the procedure mentioned above, the height and weight are plotted on the WHO growth standards height and weight charts for interpreting the nutrition status for the given subject. For the population the mean height and weight is calculated for the given group.

The nutritional status is construed for –

- Weight for height (Wasting)
- Weight for age (Under-nutrition)
- Height for weight (Stunting)

Explained in Box 1.1

13.1.1. Mean Height and Weight

The mean height and weight of the children and infant interview for the given study, for all the five districts is done and is presented in table 13.1, whilst mean height and mean weight graphs are demonstrated in figure 13.1 and 2 respectively

Table 13.1 : Mean Height and Weight of sampled population

Districts	Niwari	Panna	Rewa	Satna	Umaria	Mean	SD
< 1 months	W	3.9	0.0	0.0	3.4	3.9	2.24
	H	51.0	0.0	0.0	59.0	51.0	52.2
1-6 months	W	5.3	11.4	4.5	5.4	5.6	6.44
	H	54.9	51.9	63.2	62.2	61.8	58.8
7-12 months	W	7.8	6.3	7.2	6.7	6.0	6.8
	H	69.8	65.6	66.6	65.7	68.0	67.14
13-18 months	W	8.2	9.3	8.4	7.6	6.0	7.9
	H	69.0	74.0	70.8	71.5	69.7	70.99
19-24 months	W	8.3	9.2	12.5	8.6	8.8	9.472
	H	77.3	75.1	76.0	76.8	76.0	76.24

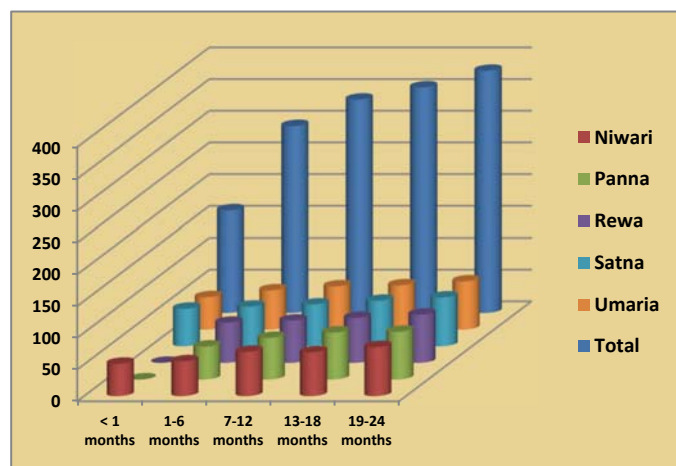


Figure 13.1: Mean Height

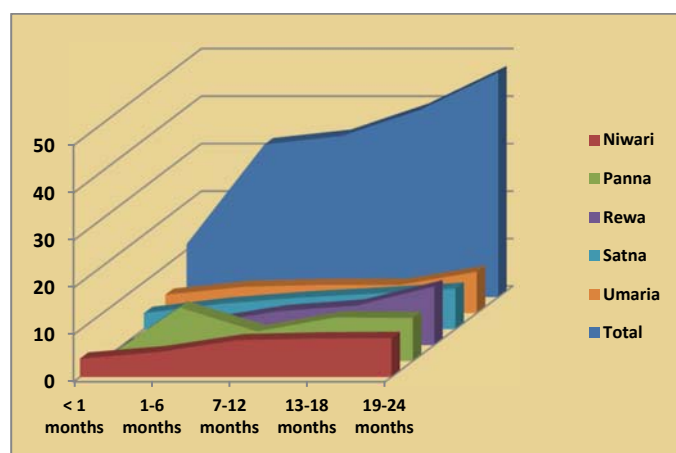
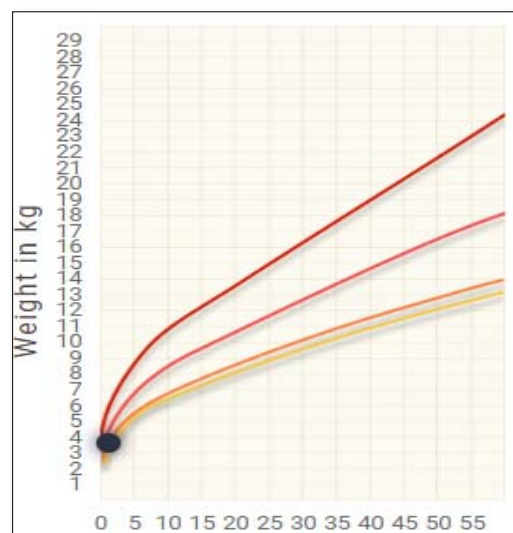


Figure 13.2: Mean Weight

13.1.1.1. For one month of age

As presented, the mean weight of children below 1 month of age is 3.7 with ± 1.8 and 53.7 with ± 2.5 i.e. it ranges from 2.7 to 5.5 kgs and height may vary from 51.2 to 56.2 cms (Graph 13.1)

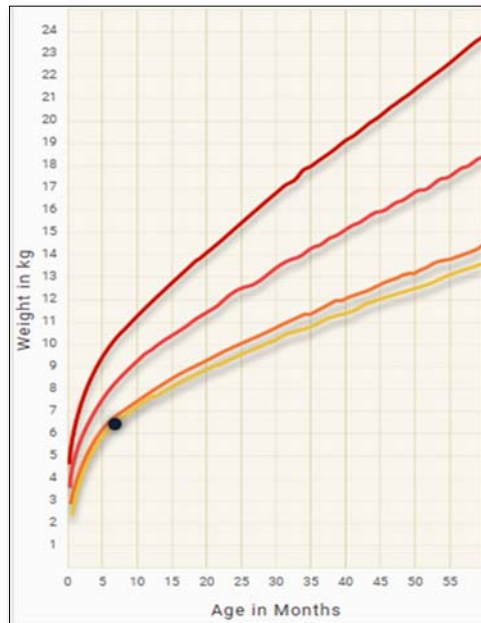


Graph 13.1 : Growth measure chart for 1 month

13.1.1.2. For 1-6 months

Table 13.1 depicts values for mean height and weight for surveyed population of age ranges from 1-6 months that the mean weight is calculated as 6.44 kgs with ± 2.5 SD that means it may vary from 3.94 kilograms to 8.94 kgs for given set of population, whereas, the mean height is interpreted 58.8.0 cms with ± 4.5 cms that means it would range from 54.3 to 63.3 cms for given set of population. (Graph 13.2)

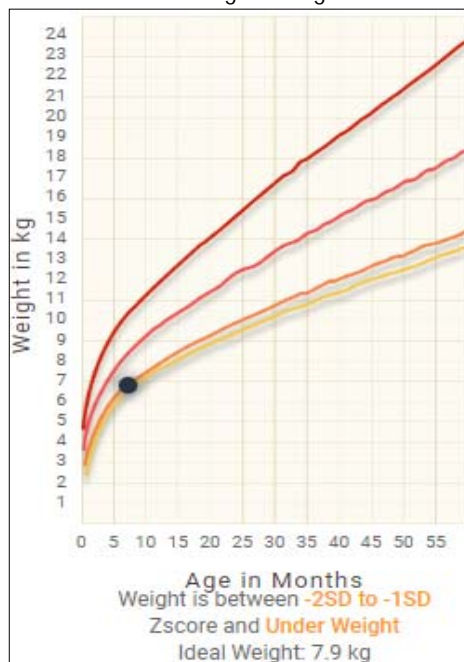
The ideal height and weight for this age group is 50.0 to 71.6 cms and 3.4 – 10 kgs (WHO growth standard) respectively, thus this age group comes under normal category.



Graph 13.2: Height and Weight plot on z-score for 1-6 months

13.1.1.3. For 7-12 months

Table 13.1 indicates the mean height for given set of population for given geographical area as 67.14 with ± 1.6 cms i.e. it would range from 65.8 cms to 69.0 cms. Similarly the mean weight is calculated as 6.8 kgs ± 0.6 kgs that ranges from 6.2 kgs to 7.4 kgs. The normal height range is 62.9 to 80.2



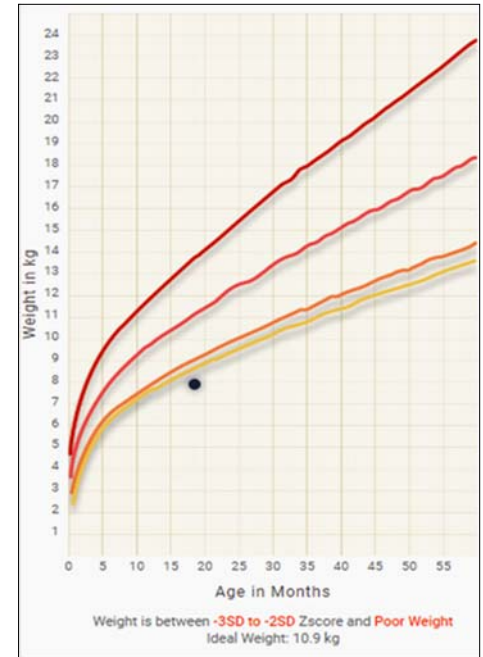
Graph 13.3 : Height and Weight plot on z-score for 7-12 months

cms and weight range is 6.1 to 11.8 kgs. Therefore the interpreted results come in undernutrition for this age group for weight. Plot on z score card is displayed in graph 13.3

13.1.1.4. For 13-18 months

As shown in table 13.1, the mean height for given set of population for this age group is 70.9 ± 1.7 that means it would range from 69.9 to 72.6 cms whereas mean weight is 7.9 kgs ± 1.1 that would range from 6.8 to 9.0 kgs.

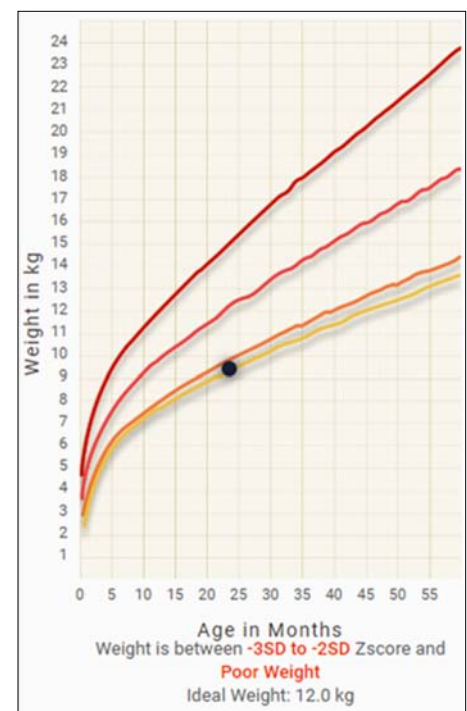
The ideal height ranges for this group is 70.3 to 74.3 cms and weight ranges from 7.3 -14.1. Thus, the age group falls under the category under-nutrition for weight. Plot on z-score card is displayed in graph 13.4



Graph 13.4: Height and Weight plot on z-score for 12-18 months

13.1.1.5. For 19-24 months

As interpreted in Table 13.1, the mean height, for this age group, for given set of population, ranges 75.4 to 77.0 cms for mean height 76.2 with ± 0.8 SD. Simultaneously weight ranges from 7.9-10.9 kgs for interpreted mean weight (9.4 ± 1.5 kgs). (Graph 13.5) The ideal height range for this group is 75.3 to 93.6 cms and weight range is 8.2 – 15.1 kgs, making this group underweight



Graph 13.5: Height and Weight plot on z-score for 18-24 months

13.1.2. Weight for Age : Undernutrition

The weight is analyzed against age for the given population and nutritional status was identified. Presented in table 13.2 and figure 13.3

Table 13.2 : Weight for Age Interpretation

Districts	Normal	%age	Moderate	%age	Severe	%age
Niwari	17	85%	2	10%	1	5%
Panna	13	65%	3	15%	4	20%
Rewa	16	80%	3	15%	1	5%
Satna	16	80%	3	15%	1	5%
Umaria	15	75%	2	10%	3	15%
Total	77	85%	13	13%	10.0	10%

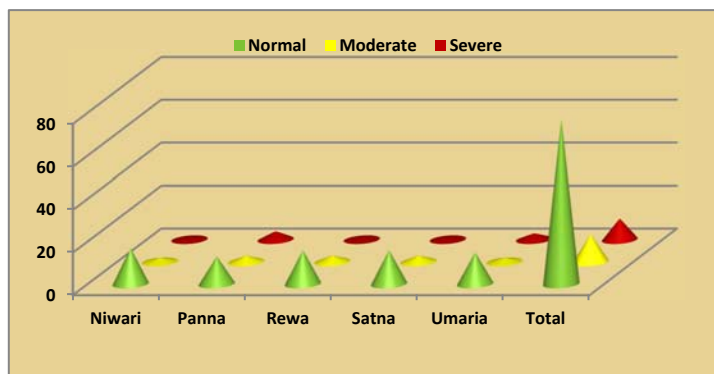


Figure 13.3 : Weight for Age Status

As shown in the table 77% of the children and infants sampled and studied comes under normal range against 13% who are at borderline of weight at yellow band. These cases require special attention to avoid them falling in the red bands.

10% of the population i.e. 10 children from the field comes under SAM category for Weight for age at -3SD percentile. Few of the spotted cases were sent to referral services immediately during the study was being conducted.

Of the districts, maximum %age of normal children belong to Niwari (17%) where 85% of its total surveyed population is normal. This is followed by Rewa and Satna where 80% of its total population is normal framing 16% of total population. Children from all the five districts have equal number of MAM children. Contrary to this, highest percentage of SAM children belong to Panna and then Umaria

13.1.3. Height for age: Stunting

The interpretation for height according to age is presented in table 13.3 and figure 13.4. As per the data, 48% of the children from all the five districts have normal grades for Height-for-age.

34% of the total sampled population are moderate whereas 18% of total population are severely malnourished i.e.

severely stunted. Amongst districts Rewa and Satna both have 20% of its children population (sampled n =40) as SAM. However 60% of Satna's sampled children are moderately stunted followed by Rewa (40%). This is serious emergency call and need action at this hour.

Table 13.3: Height for Age Interpretation

Districts	Normal	%age	Moderate	%age	Severe	%age
Niwari	12	60%	5	25%	3	15%
Panna	13	65%	4	20%	3	15%
Rewa	8	40%	8	40%	4	20%
Satna	4	20%	12	60%	4	20%
Umaria	11	55%	5	25%	4	20%
Total	48	48%	34	34%	18	18%

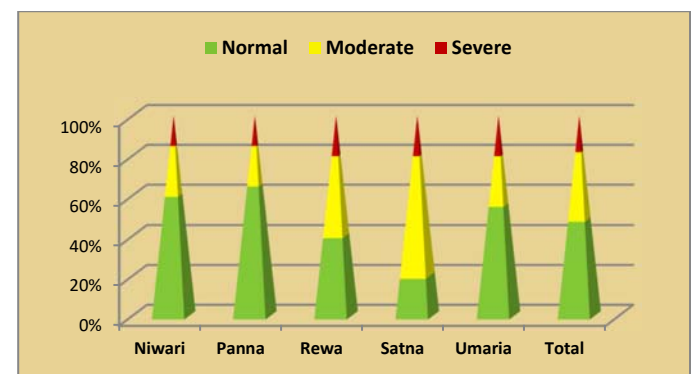


Figure 13.4 : Height for age

13.1.4. Weight for height: Wasting

The weight is again analyzed against height to interpret the wasting status for the given set of population and is presented in table 13.4 and figure 13.5

Table 13.4: Weight for height: Wasting

Districts	Normal	%age	Moderate	%age	Severe	%age
Niwari	11	55%	3	15%	6	30%
Panna	5	25%	1	5%	14	70%
Rewa	10	50%	4	20%	6	30%
Satna	12	60%	5	25%	3	15%
Umaria	4	20%	11	55%	5	25%
Total	42	42%	24	24%	34	34%

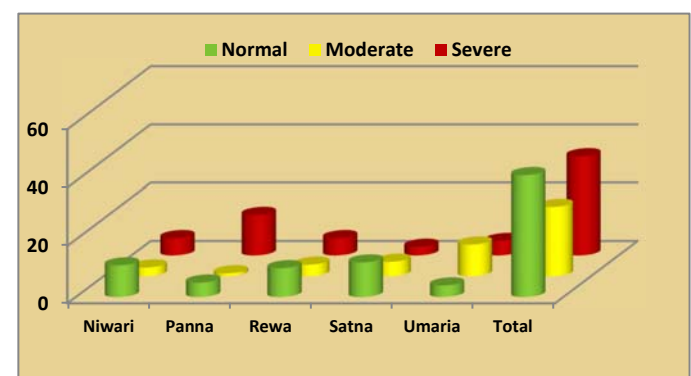


Figure 13.5: Weight for height: Wasting

As interpreted, 42% of the sampled children and infant are normal against 24% those who are moderately wasted. Severely wasting is reported in 34% of the cases wherein the maximum number of children and infants are from Panna (70% of its population) followed by Niwari and Rewa (30% of its population)

In all the above categories, the children and infants from Panna have shown the poorest nutritional status for all the three grades – underweight, wasting and stunting.

List of children and infant with their grades are tabulated in Annexure -

13.2. Growth Measures for Adult

For assessing the nutritional status of adults their height and weight are marked up to calculate BMI and the result was distributed as per the range of BMI.

Body mass index (BMI) is a simple index of weight-for-height that is commonly used to classify underweight, overweight and obesity in adults. It is defined as a person's weight in kilograms divided by the square of his height in meters (kg/m²).

The different categories of BMI is shown in Table 13.5

Table 13.6 : BMI Standards - WHO

BMI Range	Grades
Between 18-23	Normal
Less than 18	Underweight
Between 23-25	Overweight
More than 25	Obese

13.2.1. BMI Classification of Population

Classification of BMI based on Height and weight of sampled population (PLA where $n=150$) is illustrated in Table and figure 13.6

Given the table, 66% of total pregnant woman have normal BMI i.e. that their BMI ranges between 18-23. The matter of concern is the number of women(14%)who comes under the category of underweight, despite being pregnant, their BMI fall below the normal range.

Observation checkpoint :

This is a checkpoint of weight monitoring for these women sa low weight during pregnancy might lead to low birth weight of newborn and may further cause severe implications as pregnancy progresses.

As far as overweight casd detected in pregnant women, those are due to pregnancy weight and are considered negligible, provided the physiological condition of women in current scenario.

Table 13.5 : BMI classification for given population

Districts	Normal BMI 18-23	Underweigh t BMI <18	Overweigh t - BMI 18-23	Total
Pregnant mothers				
Niwari	7	2	1	10
Panna	7	2	1	10
Rewa	5	1	4	10
Satna	7	1	2	10
Umaria	7	1	2	10
Total	33	7	10	50
%age	66%	14%	20%	33%
Lactating mothers				
Niwari	5	5	0	10
Panna	7	2	1	10
Rewa	6	3	1	10
Satna	7	3	0	10
Umaria	6	3	1	10
Total	31	16	3	50
%age	62%	32%	6%	33%
Adolescent				
Niwari	6	4	0	10
Panna	6	4	0	10
Rewa	4	6	0	10
Satna	6	4	0	10
Umaria	1	9	0	10
Total	23	27	0	50
%age	46%	54%	0%	33%
SS	150	150	150	150

Similarly, 62 % of total lactating women, are normal against 32% of women who are underweight and 6% are overweight, given the post pregnancy weight gain.

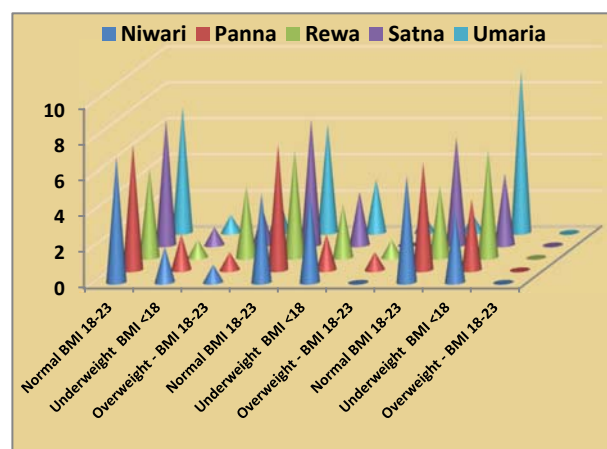


Figure 13.6 : BMI classification for PLAs

However 54% of total adolescent girls are underweight and anemic against 46% of normal adolescent girls.

Observation checkpoint :

This adolescent girls should be counseled for proper diet and iron rich food as becoming underweight at this age might lead to cause medical and health problems during alter ages in life

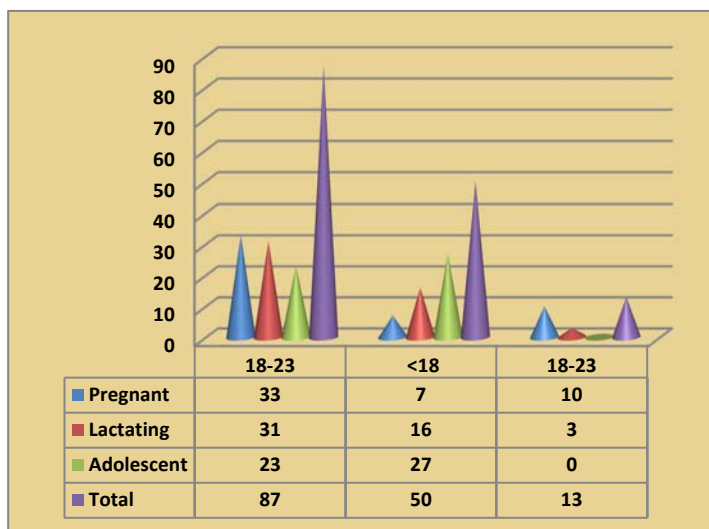


Figure 13.7 : BMI Distribution of PLAs

As clear from the figure 13.7, 87 of the total population (150) are normal where as 50 out of 150 are underweight. A very low percentage of about 8% comes under category of overweight. Amongst which maximum are from Pregnant group

Amongst the district the maximum underweight adolescent belong to Rewa due to poor dietary intake.

13.2.2. Severity of Underweight

The severity of underweight as interpreted from the field data is put in Table 13.6 and figure 13.8

Table 13.7 : Severity of Underweight

Groups	17.6-18.5	16.6-17.5	15.6-16.5	Below 15.5	Total	%age
Pregnant	4	2	0	1	7	14%
Lactating	9	4	3	0	16	32%
Adolescent	12	2	8	5	27	54%
Total	25	8	11	6	50	33%
%age	17%	5%	7%	4%	33%	33%

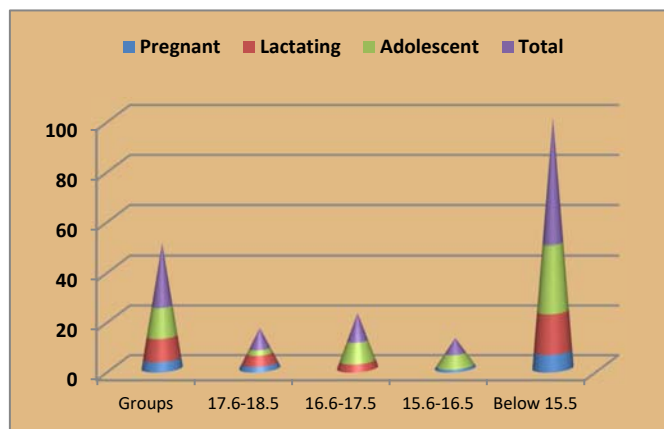


Figure 13.8: Severity of Under-nutrition

As data suggests, the identified underweight PLA population from the field are 33% of the total sampled size (n=150) i.e. 50 women and girls are found underweight.

Amongst which few are severely undernourished, whose BMI even falls below 15.5. One pregnant case and 5 adolescent cases are recorded in this regard. 21% of the total population is suffering severe under nutrition, whose BMI ranges from 15.6-16.5.

In all the categories presented in the table, adolescent group is framing the highest percent then by lactating and last by pregnant women.

Observation checkpoint :

This lays serious and severe implication on health in any vulnerable stage – pregnancy, lactation or adolescence and is needed to be addressed as early as possible. There is a dire need to counsel these individuals and their families and should be referred to health centres or hospital for further medical investigation

The detailed list of respondents having very low BMI range is provided in Annexure

13.2.3. Mean Height

The mean height for all the three group – pregnant, lactating and adolescent is calculated and is shown in Table 13.8 and figure 13.9

Table 13.8 : Mean Height interpreted for PLA

Districts	Pregnant mothers	Lactating mothers	Adolescent
Niwari	152.0	151.7	147.1
Panna	150.4	141.6	146.2
Rewa	147.0	148.7	147.4
Satna	146.8	152.1	145.8
Umaria	153.6	150.5	146.6
Mean	150.0	148.9	146.6
SD	2.5	3.6	0.5

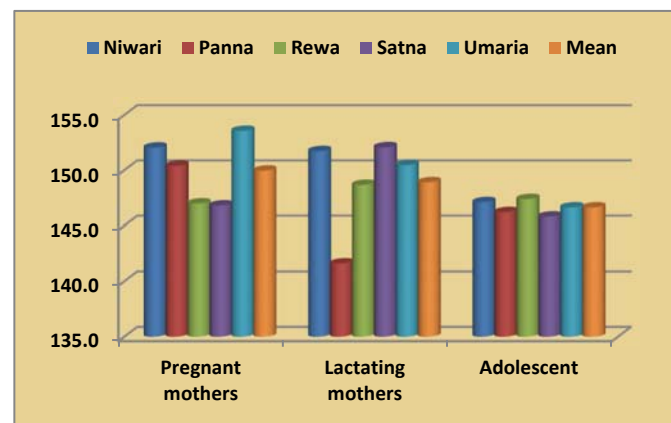


Figure 13.9: Mean Height of PLAs

As data suggests the mean height is calculated for pregnant women is 150 cms \pm 2.5, 148.9 \pm 3.6 cm for lactating and 146.6 \pm 0.5 cm for adolescent. The highest height is recorded for pregnant women from Umaria and lowest height recorded for adolescent from Satna

13.2.4. Mean Weight

The mean weight for the entire group is recorded in table 13.9 and is displayed in figure 13.10. The data suggests that the mean weight interpreted for pregnant women is 48.2 \pm 2.0 Kgs; 44.1 \pm 0.7 kgs for Lactating and 39.4 \pm 1.6 kgs for adolescent.

The highest weight is recorded is 50.9 for pregnant women from Umaria and lowest is recorded as 36.0 for adolescent from Umaria.

Table 13.9 : Mean weight interpreted for PLAs

Districts	Pregnant mothers	Lactating mothers	Adolescent
Niwari	48.1	44.2	41.2
Panna	49.2	42.8	40.4
Rewa	48.0	44.7	39.1
Satna	44.7	44.5	40.2
Umaria	50.9	44.3	36.0
Mean	48.2	44.1	39.4
SD	2.0	0.7	1.6

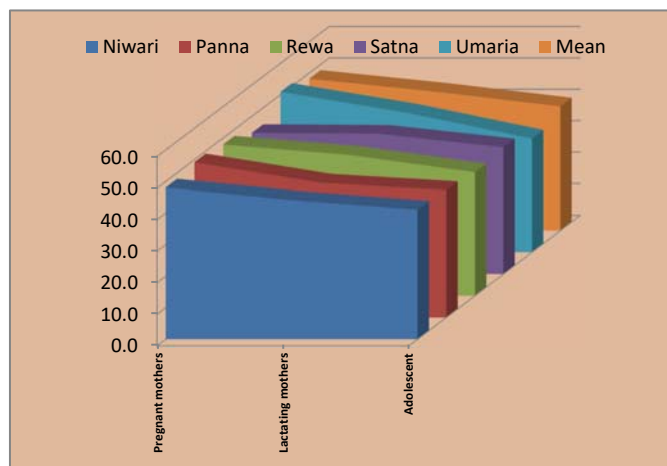
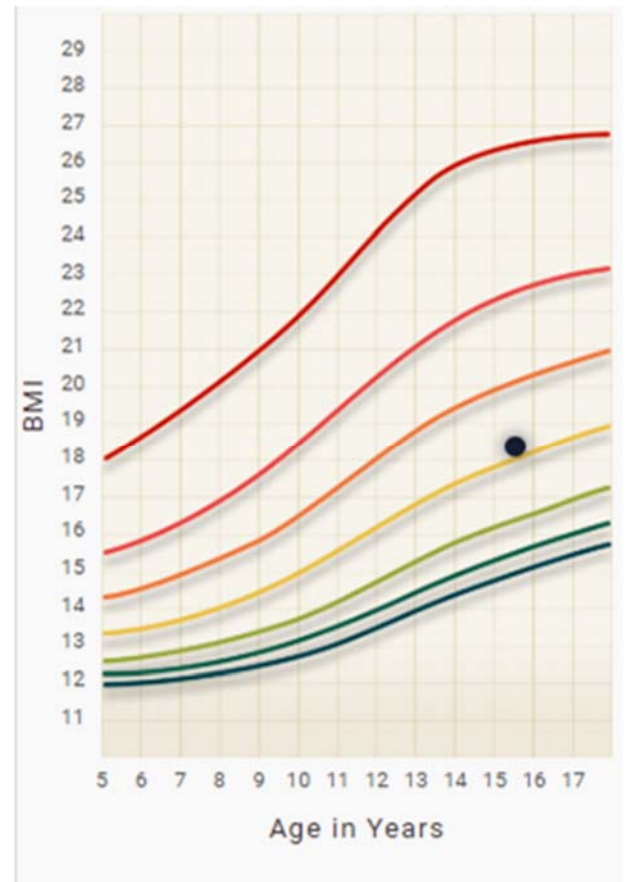


Figure 13.10 : Mean Weight for PLAs

Also, the mean height and weight for adolescent girl is plotted on the standard growth chart provided by WHO and is shown in Graph 13.6. It states clearly that for the given set of population the average height and weight is lower than the standards



Graph 13.6: BMI of Mean height and Weight of Adolescent

Furtherance, the height and weight recorded for pregnant and lactating women are far from the standards determined for the reference adult Indian women who has height of 160 cms and weighs 55 kgs with no physiological conditions

14. Chapter Fourteen– Clinical Assessment

Physical signs and symptoms of malnutrition can be valuable aids in detecting nutritional deficiencies. These include physical appearance, Pallor of the skin, mucous membrane surfaces, sides of eyes and mouths, nail beds etc. The sooner the signs get detected and the diagnose is made the faster the nutritional status can be improved and public health interventions can be formulated.

The clinical assessment done during this study is documented below –

14.1. Physical Appearance

The physical appearance determines the status of health to certain extent. In most of the cases the child appears his health, except for ectomorphic body type where the body has lean composure. Apart from that, the fat distribution within a body is reflected in the physical appearance.

The data from the field is deciphered through table and figure 14.1

Table 14.1: Nutritional status by physical appearance

Districts	Normal	Severe Malnourished	Malnourished
Niwari	6	1	3
Panna	8	0	1
Rewa	8	1	1
Satna	4	2	4
Umaria	3	3	4
Total	29	7	13
%age	58%	14%	26%

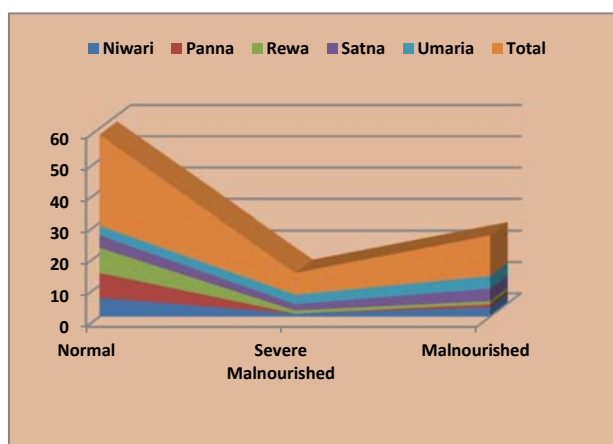


Figure 14.1: Nutritional status by physical appearance

As indicated, 58% of the children appeared for the clinical assessment seems normal compared to 26% who looked undernourished and 14% who look severely malnourished.

The maximum cases of undernourished children and severely malnourished children are observed from Umaria, Satna and Niwari. Contrary to what have been observed in case of anthropometrical analysis, children from Panna doesn't seem to be that malnourished as the fact and figure says out.

The poor fat distribution is due to lack of proper nutrients in the diet especially the missing of essential fatty acids and amino acids. Energy malnutrition also causes degradation of fat over a longer period if not consumed with fat rich diet.

14.2. Hair texture

As hair is composed of protein –keratin and micronutrients, the change in the body profile affect the texture of hair as well. Dyspigmentation, graying, pluck able dry and lusterless hair all are associated signs of grades of malnutrition. The analysis is presented in table 14.2 and figure 14.3

Table 14.2 : Hair texture analysis

Districts	Normal	Lack of natural shine; hair dull and dry; thin and sparse; hair
Niwari	7	3
Panna	7	3
Rewa	4	6
Satna	2	8
Umaria	4	7
Total	24	27
%age	46%	54%

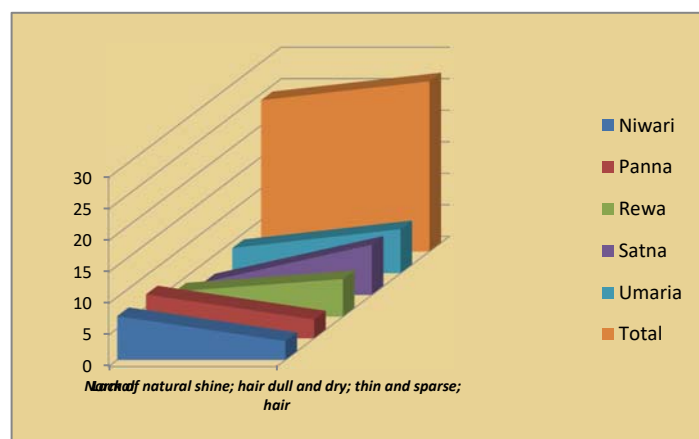


Figure 14.2: Hair texture

According to table and figure shown above, only 46% of the sample population has normal hairs against 54% who have

dull, lusterless hairs mostly dry and scaly. This represent the loss of protein from the body. Most of these cases are recognized with some form of malnutrition (refer chapter 13) and thus clinical visibility of signs are also present.

14.3. Eyes

As undernutrition results in micronutrient deficiencies, the prolonged effect may cause changes in eye color too. The clinical analysis for eyes is elucidated in Table and figure 14.3

Table 14.3: Clinical signs in Eyes

Districts	Normal	Pale	Heavy
Niwari	7	3	0
Panna	9	1	0
Rewa	5	4	1
Satna	1	7	2
Umaria	5	5	0
Total	27	20	3
%age	54%	40%	6%

The table deciphers the normal eyes for 54% of children participated in the study, however, 40% of them have pale eyes and conjunctiva i.e. injected conjunctiva and results from anemia.

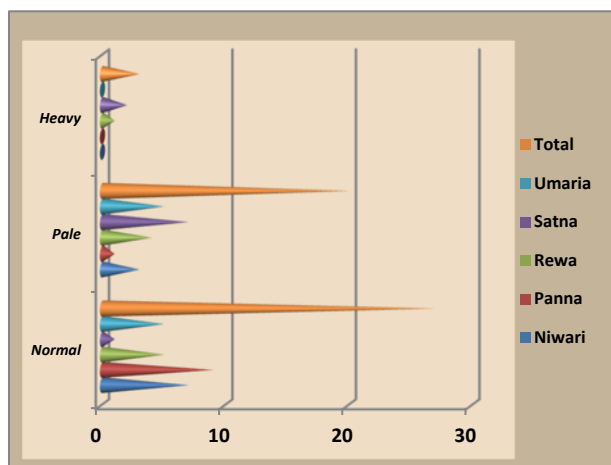


Figure 14.4 : Clinical signs in Eyes

6% of sampled children have also shown the deep dark red eyes with heavy eye lids with other signs. This could be result from deficiency of Vitamin A, zinc along with protein

14.4. Mouth

The analysis as shown in table and figure 14.4 suggests that 92% of the children have shown no signs of clinical deficiencies for mouth, except for 6% who have wounds on sides of mouth.

Cracks at the corner of the mouth are visible in those who have shown extreme form of malnutrition (Table). This is the

Table 14.4: Clinical signs for Mouth
most common form of angular cheilitis results from deficiency of riboflavin, niacin and pyridoxine .

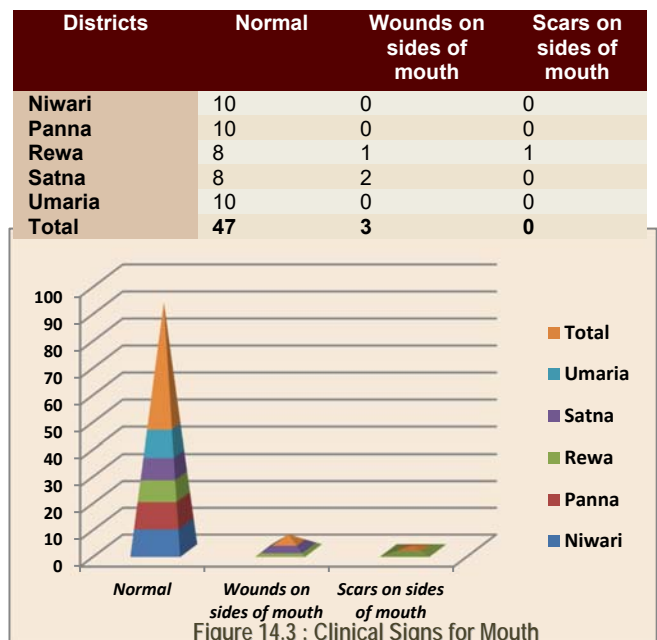


Table 14.5 : Clinical Signs for Face

%age	92%	6%	2%
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Only one case reported in Rewa has shown scars around the mouth. The child has shown other severe signs of clinical malnutrition and was sent for referral.

14.5. Face

The clinical signs and symptoms shown for face is analyzed and explicated in Table and figure 14.5

Districts	Skin color uniform; smooth, pink, healthy appearance; not swollen	Skin color loss (depigmentation)	lumpiness or flakiness of skin of nose and mouth;	swollen face
Niwari	9	1	1	0
Panna	8	2	1	1
Rewa	8	2	1	1
Satna	3	7	5	2
Umaria	10	0	0	0
Total	38	12	8	4
%age	76%	24%	16%	8%

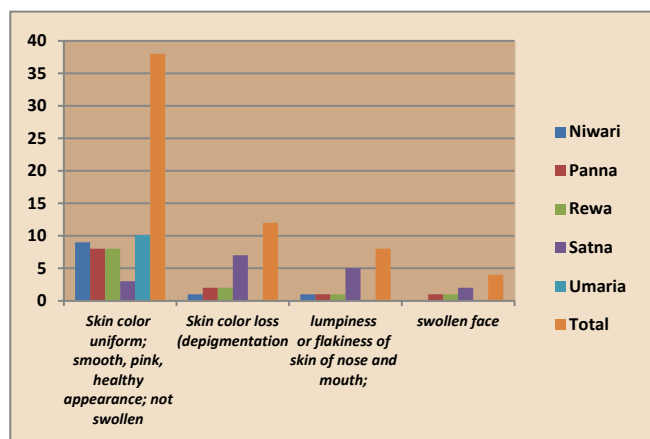


Figure 14.5: Clinical Signs for Face

As fat disappears and other nutritional deficiencies occurred when malnutrition grades up, there are certain changes that take place and are visible on face. The data from the fields interpret that 76% of the total population has shown no changes on the face.

However, Dyspigmentation of face with loss of skin color is reported by 24% and largely from Satna (35% of its population), probably due to deficiencies of Vitamin B complexes.

16% of total sampled population also showed lumpiness and flakiness of skin caused majorly due to loss of zinc and other minerals include selenium and magnesium. The population largely from Satna (25% of its population)

14.6. Tongue

Depicted from Table and figure 14.6 data interprets 90% of population has shown no change in the appearance of tongue and no clinical symptoms

Table 14.6: : Clinical signs of Tongue

Districts	Deep red in appearance; not swollen or smooth	Swelling; scarlet and raw tongue
Niwari	9	1
Panna	10	0
Rewa	9	1
Satna	7	3
Umaria	10	0
Total	45	5
%age	90%	10%

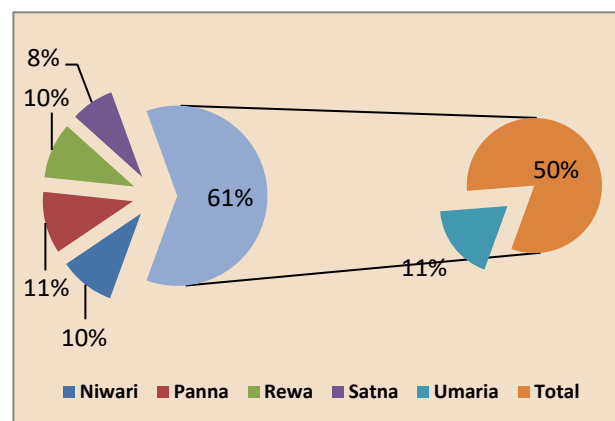


Figure 14.7: Clinical signs of Tongue

However, 10% of the total sampled population has swollen, and red tongue. This can be due to tongue atrophy or tongue fissuring resulting from deficiencies of Niacin and Riboflavin.

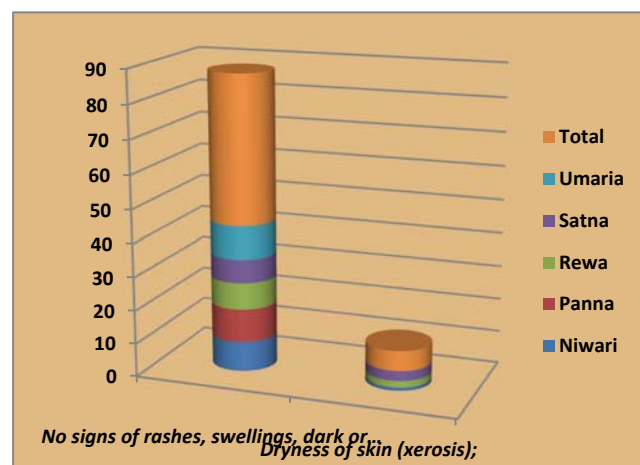
The cases those have shown the clinical signs belong to Satna (25% of its total sampled population). One case each is reported from Niwari and Rewa.

14.7. Skin

The clinical signs shown on skin by the population are represented in Table and figure 14.7

Table 14.7: Clinical signs of skin

Districts	No signs of rashes, swellings, dark or light spots	Dryness of skin (xerosis);
Niwari	9	1
Panna	10	0
Rewa	8	2
Satna	7	3
Umaria	10	0
Total	44	6
%age	88%	12%



The normal skin is shown by 88% of subjects whereas, dryness of skin with patches is observed in 12% of the children/infants studied.

The dryness of skin is caused due to deficiency of Vitamin A and zinc. The majority of the cases are reported from Satna

Figure 14.6: Clinical signs of Skin

(15% of its total sampled population)

14.8. Other medical condition

While clinical assessment was performed, number of children reported other medical problems, those are recorded and is flashed in Table and figure 14.8

Table 14.8: Other Medical Conditions

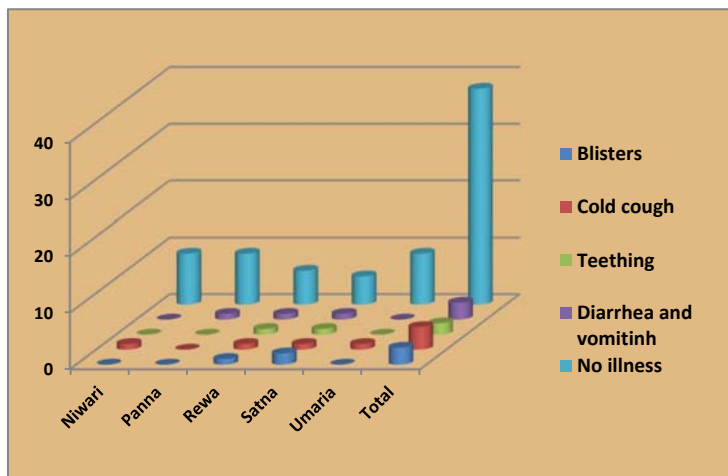


Figure 14.8: Different medical condition

As interpreted from the data, 75% of the children studied on clinical assessment have shown no other medical conditions, insomuch as 8% of the interviewees suffered cold and cough against 6% those who suffered diarrhea and vomiting for the similar conditions.

Districts	Blisters	Cold cough	Teething	Diarrhoea and vomiting	No illness
Niwari	0	1	0	0	9
Panna	0	0	0	1	9
Rewa	1	1	1	1	6
Satna	2	1	1	1	5
Umari	0	1	0	0	9
Total	3	4	2	3	38
%age	6%	8%	4%	6%	75%

Again 6% of the respondents have blisters all over the skin and 4% those who have been facing teething issues. The blisters appeared mainly due to drinking of water polluted with rainwater and poor maintenance of hygiene and cleanliness around handpumps, during rainy season.

Majority of cases belong to Satna (50% of its total sampled population) suffered either of the medical condition stated in here; followed by Rewa (40% of its total sampled population).

Panna, Niwari and Umari have better condition where 90% of their total sampled children and infants are devoid of illness, when screened clinically. 10% of their population suffered seasonal cold and cough.

Observation checkpoint :

This is checkpoint for analysis of water bodies serve as source of drinking water specially during rainy seasons, which gets contaminated and provides the major bank for cross contamination of toxins and bacteria leading to diarrhea, vomiting, blisters, etc

III. Subsection Three – Profile of Community Food

15. Chapter Fifteen– Traditionally Available Foods

Approaches of buttoning down indigenous peoples' traditional food system have been construed at length by United Nations agencies and in number of researches and publications.

Across the world, there is a spread of more than 370 million Indigenous Peoples, speaking over 4000 languages, positioned in over 90 countries. Residing in their bucolic homelands, they are dependent on traditional and regional food systems rooted in historical connections, where food is yielded with traditional knowledge naturally, prepared and served in their cultural settings.

Howbeit, over decades and centuries, the Indigenous plate today have great portion coming from market-purchased food, due to nutritional and industrial transition thus traditional indigenous food definition from conventionally harvested food to locally available foods.

Thus, recognizing the ample indigenous knowledge, and research to identify the available species and varieties of food, the composition of nutrients and other properties are at the pivot of this chapter.

15.1. Community Food System Data – Availability of Food

For establishing the foods normally consumed, data were collected through field visits and a rigorous food consumption survey adapted from standard tools (Kuhnlein and Pelto, 1997; Kuhnlein, 2000; Kuhnlein, 2003).

Scientific names, common names, and food preparation were documented and are presented in Table . Nutrient values for all foods were calculated using the Indian Food Composition Tables (*ICFT Table Standards, 2017 by ICMR; C. Gopalan, Rama Sastri and Balasubramanian, 2002*).

15.1.1. Traditional Food listing

There are total two seventy (270) food items spotted from the field data out of which two thirty four (234) food consumed by communities studied, are identified and tabulated in Annexure. Apart from this, there have been thirty six (36) items remained unidentified due to lack of available data and researches. These foods were further classified into food groups and number of food distributed per group is shown in Table and figure 15.1

Thank you for the food, which you have given us

–Rhil Savina

15.1.1.1. Cereals and Millets

Only two types of the most common cereals consumed are wheat and rice only. However, the varieties of rice have been observed to be consumed by the communities.

There are seven types of millets have been identified from the field. Maximum have been spotted from Umari (5) then Rewa (3) whereas community in Niwari are not consuming any millet except for those which are available seasonally.

15.1.1.2. Green leafy Vegetables

Community is found rich when comes to GLV and fruits. It offers 37 types of green leafy vegetables, often liked and consumed by most of the tribes and non-tribes community folks. Almost all the districts have shown rich green leafy vegetable availability, except for Panna where it is

Food Groups	Niwari	Panna	Rewa	Satna	Umari	Total	%age
Identified	107	102	138	104	158	234	87%
Unidentified	9	12	12	9	5	36	13%
Cereals	2	2	2	2	2	2	1%
Egg	6	5	4	2	10	13	5%
Fish	8	3	14	7	24	37	14%
Fruits	12	15	22	12	17	37	14%
GLV	23	21	24	24	31	36	13%
Grass	1	0	0	0	0	1	0%
Herb	1	1	3	2	2	4	1%
Meat	4	3	7	4	8	15	6%
Millets	0	1	3	2	5	7	3%
NTPF	7	7	7	7	6	7	3%
Poultry	9	8	9	8	12	14	5%
Pulses and legumes	5	6	6	5	6	8	3%
Roots and Tubers	10	8	11	9	15	24	9%
Shrub	0	1	1	0	1	1	0%
Stems	1	0	1	1	1	1	0%
Vegetables	17	20	23	18	17	26	10%
Weed	1	1	1	1	1	1	0%

comparatively low.

15.1.1.3. Fruits

As mentioned earlier, the wild cultivation offers rich fruits depending upon the seasonality. Thirty-seven types (37) of fruits have been identified from the five districts, wherein Rewa has to offer the most (22) followed by Umaria (17), Panna (15) and Satna and Niwari (12)

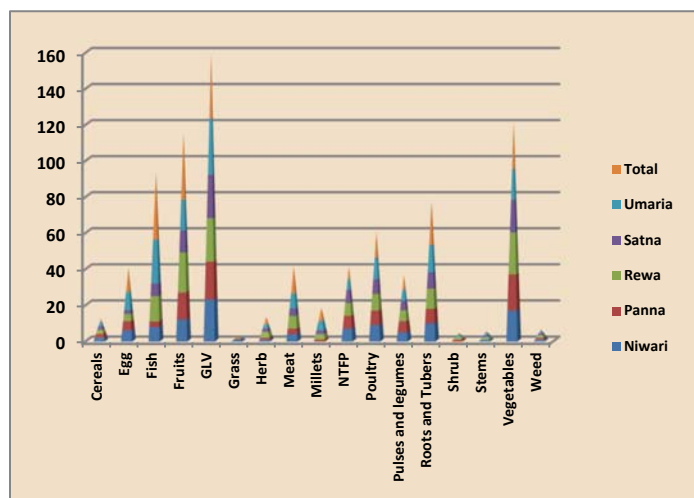


Figure 15.1 : Food group classification

15.1.1.4. Vegetables

There are in total 26 types of vegetables, those have been consumed by community. 23 from Rewa, 20 from Panna, 18 from Satna followed by 17 from both Niwari and Umaria offer a diverse variety during different seasons.

15.1.1.5. Roots and tubers

Twenty four types of roots and tubers are consumed, largely spotted in Umaria (15) and Rewa (11) followed by Niwari (9) then Satna and Panna (9)

15.1.1.6. Pulses and legumes

Total 8 types of pulses and legumes are identified where; Umaria, Panna and Rewa have 6 types whereas Niwari and Satna have only 5 types.

15.1.1.7. NTFP

All the five districts have shown rich presence of NTFP. & types of NTFP have been spotted and consumed both on household and commercial levels

15.1.1.8. Herb, Shrub, Stems and Weeds

4 types of herbs, one type each of shrub, stem and weeds are also spotted from all the districts

15.1.1.9. Egg

Thirteen types of eggs are spotted and are still being consumed provided with availability, once in a month or a in a season frequency. Maximum are identified from Umaria almost 10 types followed by Niwari and Panna (6)

15.1.1.10. Fish

Thirty seven types of fish is consumed primarily in the water sou then Rerce rich areas like Umaria (24)and Rewa (14)where maximum of the fish is spotted. In Umaria it is even used for commercial purpose

15.1.1.11. Meat and Poultry

15 types of meat and 14 types of poultry are consumed provided with availability once-in-a-season basis. Maximum of these are identified in Umaria, followed by Rewa then Panna and Niwari. Satna spotted to have lesser variety of food stuffs available.

15.1.2. Classification based on origin

Based on the origin the food is classified under two groups– Animal and plant origin and is displayed in Table15.2 and Figures 15.2 and 15.3

Table 15.2: Classification based on origin

Districts	Plant origin	Animal Origin
Niwari	59	27
Panna	63	19
Rewa	85	33
Satna	63	21
Umaria	84	54
Total	234	36
%age	87%	13%

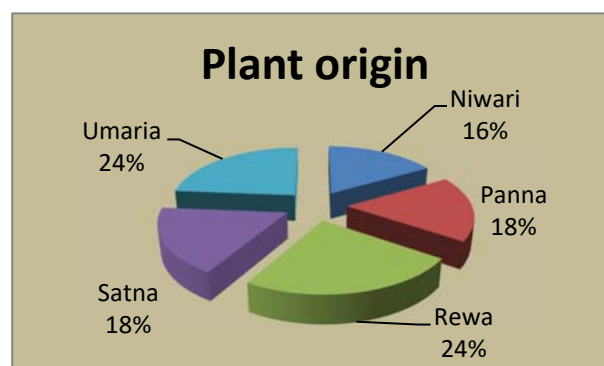


Figure 15.2: Distribution according to Plant origin

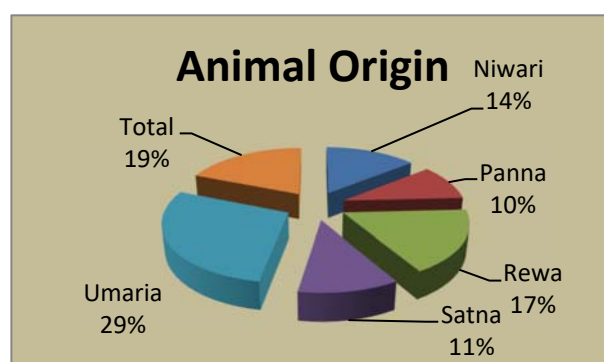


Figure 15.3: Distribution based on animal origin

As clear from the figures and tables, eighty percent of the total foods identified 87% is derived from Plant origin and only 13% belong to animal origin. In plant origin the maximum is offered by Rewa and Umaria (24%) then by Satna and Panna (18%) and lastly by Niwari (16%)

Similarly, Umaria offers rich sources of protein rich animal origin food by 35% followed by Rewa (21%) then Niwari (18%) and Satna (14%). Panna has the least variety to offer for animal origin (12%)

15.1.3. Classification based on Month wise availability

Based on month wise-availability the identified foods were classified further and is explained through Table 15.3 and Figure 15.4

Table 15.3 : Month-wise availability

Districts	March-June	July-October	Nov-Feb
Niwari	32	26	55
Panna	23	18	38
Rewa	30	19	46
Satna	23	17	41
Umaria	35	20	54
Total	143	100	234
%age	61%	43%	100%

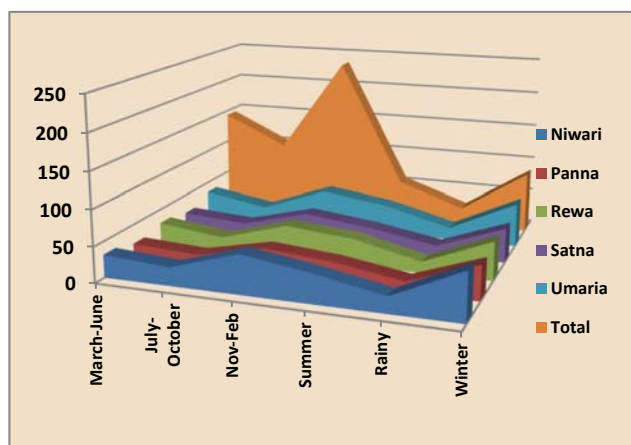


Figure 15.4: Monthly and seasonal availability

As predicted from the table, the maximum foods (100) are available during the month of November and February then in March and June (61%) followed by March and June then followed by July October where availability drops down by 57% and is left with 43% of the total food.e. only 100 food items remain during July and October

Within districts, the maximum food items are present in Niwari during all the months categorized (48%) followed by Umaria with 47% then in Rewa by 41%. Similar pattern is followed by each district during different months.

15.1.4. Classification based on Seasonal availability

The foods are available as per the environment and climatic conditions thus; seasons affect the most on the availability and therefore categorized based on three seasons – summer, winter and Rainy and is illustrated in table 15.4 and figure 15.4 and 15.5.

Table 15.4 : Seasonal availability of food

Districts	Summer	Rainy	Winter	132
Niwari	41	23	68	132
Panna	30	15	49	94
Rewa	38	16	55	109
Satna	30	14	49	93
Umaria	41	17	62	120
Total	57	25	86	168
%age	24%	11%	37%	72%

The data depicts that availability of food is maximum in winter i.e. 37% then remained available in summer (24%) whereas the least availability is reported in rainy seasons i.e. by 11%

The seasonal availability also represent the same trend as shown during month-wise availability i.e. Niwari with 56% has shown the highest availability of food items compared to Umaria that comes second to it with 51% i.e. offering 120 items in totality during all the seasons.

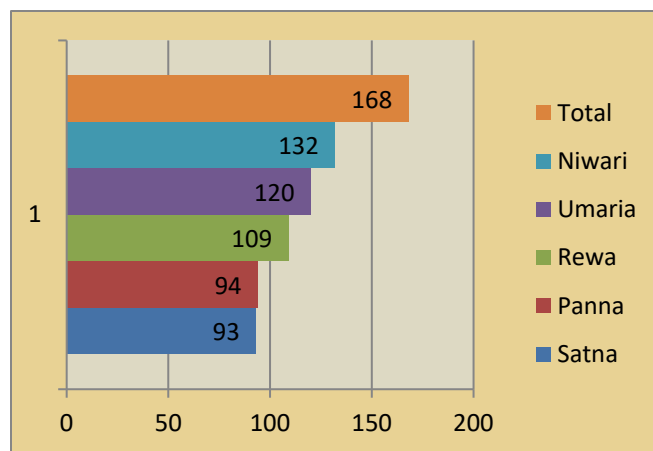


Figure 15.5 : Seasonal distribution amongst districts

This is immediately followed by Rewa which also has great concurrence when comes to availability. With 109 items during all seasons, it provides 47% of total food identified. Satna and Panna being the lowest of all provides 40% of total identified foods

15.1.5. Classification based on types of crops

The crop is basically distributed into three types– Rabi, kharif and summer crops. During the study, the two major types of the crops have been spotted – Rabi and Kharif.

Due to lack of water resources, summer crops are zero practiced and also Rabi crops are almost at the verge of being extinct. Data presented in table 15.5 and figure 15.6 classifies the food based on these types.

Table 15.5 : Types of crops

Districts	Rabi	Kharif	Total
Niwari	66	71	69
Panna	69	71	70
Rewa	102	106	104
Satna	71	76	74
Umaria	116	120	118
Total	198	204	201
%age	85%	87%	86%

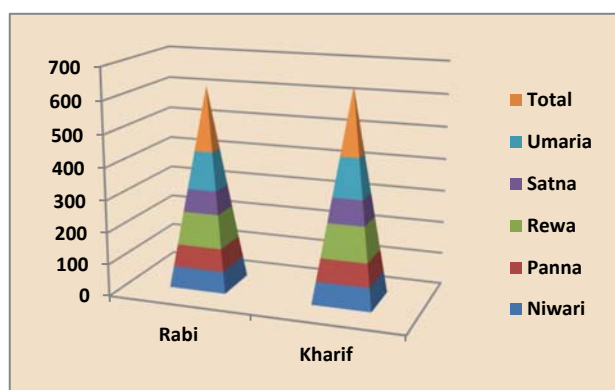


Figure 15.6: Rabi and Kharif crops

As presented maximum percentage of identified foods are kharif crops with 204 total food items i.e. 87% of the total food items whereas Rabi crops constitutes only 2-3 percent lesser than kharif, primarily due to availability of maximum food items during both crop harvesting time.

In totality 86% of the total identified food items i.e. 201 comes under rabi as well as kharif. The remaining 28% are either wild cultivation or those who have been extinct or brought from markets.

Amongst the districts the highest number of items are reported by Umaria (201) then by Rewa (104) Satna, Panna and Niwari has fairly low foods about 74, 70 and 69 respectively, under both types.

15.2. Conservation status

Locally varied food production systems, which are more resilient to climate change, are under threat; agro biodiversity is disappearing and, along with it, knowledge of traditional medicine and local foods. Conservation status of any foods determines its availability in the region whether the food is enough or at the danger of extinction.

Table 15.6 and figure 15.7 delineate the conservation status as observed from the field.

As the data depicts 82% of the identified foods are available in the terrain against 11% those comes under threatened category and might be extinct in the coming decades or even years.

Table 15.6: Conservation Status

Districts	Available	Threatened	Extinct
Niwari	67	6	6
Panna	72	8	4
Rewa	101	9	5
Satna	74	6	2
Umaria	118	8	6
Total	192	26	11
%age	82%	11%	5%

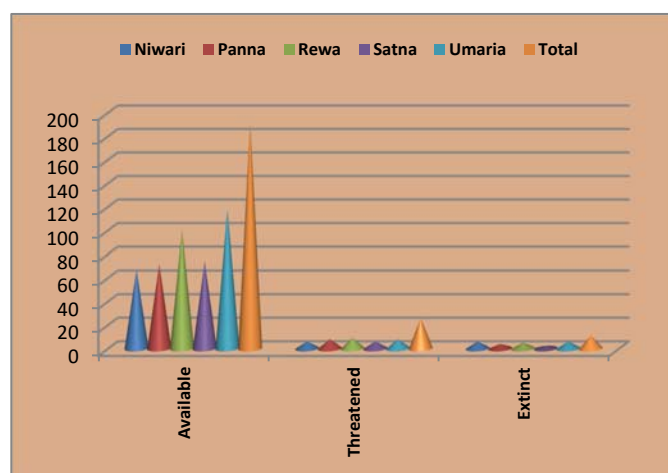


Figure 15.7 : Conservation Status

15.2.1. Extinct and Threatened Foods

Grievously, 5% of the identified foods are now extinct and as suggested by community these foods have been extinct in last one decade only primarily due to unavailability of crops, seasonal and climatic variations and environmental constraints.

The foods those have been extinct completely is demonstrated in table 15.7 and those are threatened or at danger of extinction are presented in table 15.8

As concluded from the table 15.7, two types of green leafy vegetables and three types of pulses and legumes especially the most common kind *ahar dal* (Split gram) has been extinct from the region due to extra time it takes in being harvested. For this community is largely dependent on the market only. As the rates are too high to be affordable, they settle down with poor quality or no pulses at all. Two types of fruits and roots and tubers have also disappeared.

Table 15.7: List of Extinct Foods

Traditional Food Name/ Item	English name	Taxonomic classification	1.	2.	3.	4.	5.	Niwadi Panna Rewa Satna	Food Group	Food Parts
Ban kachariya	Bitter cucumber	<i>Cucumis callosus (Rottl) Cogn.</i>		2	3		5		Fruits	seeds
Ghui	Roxburgh fig	<i>Ficus auriculata</i>	1						Fruits	seeds
Alsi	Linseed	<i>Linum usitatissimum</i>	1		3	4	5		GLV	Fruits
Midnight creeper	Phang	<i>Rivea hypocrateriformis</i>			3		5		GLV	Tubers
Sugarcane	Sugarcane	<i>Saccharum officinarum</i>	1						Grass	Fruits
Arhar	Split red grams	<i>Cajanus cajan</i>	1	2	3	4	5		Pulses & legumes	Seeds
Soyabean	Soybean	<i>Glycine max</i>	1	2			5		Pulses & legumes	seeds
Banmungiya	Three-lobed leaf cowpea	<i>Vigna Trilobata (L.)</i>			3				Pulses & legumes	Rhizomes
Kamalkand	Indian lotus	<i>Nelumbium speciosum Willd</i>		2					Roots & Tubers	Root
Gainthi	Yam	<i>Dioscorea bulbifera L.</i>	1						Roots & Tubers	seeds
Bilaikand	Purple Yam	<i>Dioscorea alata Linn.</i>					5		Roots & Tubers	Stem

Table 15.8 : List of Threatened foods

SN	Traditional Food Name/ Item	Local name/ English Name	Taxonomic classification	1.	2.	3.	4.	5.	Niwadi Panna Rewa Satna	Food Group	Parts
1	Bakaina	Chinaberry Tree	<i>Melia Azedarach</i>			3				Roots and Tubers	seeds
2	Ban Angur	Vitaceae	<i>Cissus Vitiginea</i>			3				Fruits	Fruits
3	Ban Bhata	Wild Brinjal	<i>Solanum Incanum</i>			3	4			Vegetables	Fruits
4	Barahsingha	Swamp Deer	<i>Rucervus Duvaucelii</i>	1			4			Meat	Mutton
5	Ghuguchi	Jequirity Bean	<i>Abrus Precatorius L.</i>	1						Roots and Tubers	Leaves
6	Go	Bengal Monitor	<i>Varanus Bengalensis</i>			3				Meat	Mutton
7	Goolar	Cluster Fig	<i>Ficus Hispida L.</i>		2	3				Fruits	Fruits
8	Gursakri	Grewia	<i>Grewia Hirsuta</i>			3				Roots and Tubers	Rhizomes
9	Jalmurgi	Common Moorhen	<i>Gallinula Chloropus</i>	1						Poultry	Whole
10	Kachariya	Cucurbitaceae	<i>Cucumis Pubescens Willd</i>		2					Fruits	Fruits
11	Kachnar	Orchid Tree	<i>Bauhinia Variegata L.</i>				4			GLV	Flower
12	Kakai	Ramontchi	<i>Flacourtia Indica</i>					5		Fruits	Fruits
13	Kakun Millet	Foxtail	<i>Setaria Italica</i>				4	5		Millet	seeds
14	Maize	Sorghum	<i>Sorghum Bicolor</i>		2	3	4	5		Millet	seeds
15	Palas	Flame Of The Forest	<i>Butea Monosperma Lamk</i>	1						Vegetables	flower
16	Rai Bhaji	Black Mustard	<i>Brassica Nigra</i>	1				5		GLV	Leaves
17	Rice	Rice	<i>Oryza Rufipogon Griff</i>	1	2	3	4	5		Cereals	seeds
18	Seetaphal	Custard Apple	<i>Annona Squamosa L</i>							Fruits	Fruits

Depicted from table 15.8, there are 18 food items those are at verge of being extinct. Shocking of them all is rice, which looking to current and previous trends of cultivation might be vanished from the region as reported by community people. Ten types of fruits including, *Ban Angur*, *Goolar*, *Kachariya*, *Kakai*, *seetaphal*, *Ban Angur*, *Goolar*, *Kachariya*, *Kakai*, have decreased over years and might not present for future generation as suggested by elderly.

Similarly green leafy vegetables like kachnar and rai bhaji, kakun and maize in millets, jalmurgi in poultry, guguchi, akaina bakaina, and gursakri amongst roots and tubers are at verge of losing.

15.2.2. Food transport status

Not all the food that is available, is grown in the terrain, few of it might be growing at other place and are brought through the market and vice-versa. This status is delineated through Table 15.9 and figure 15.8

Table and figure shows that both the food those are grown here and those have been grown in the respective districts and are sent for commercial purposes, share the same percentage (21%).

Also with a few difference of 4% there are 38 items those have been brought from the market. The total transport of all the five districts is reported to be of 57%

Amongst the district the maximum food transport pattern is observed in Umaria (figure 15.8) where 50 items are brought from the market and 65 items are sent commercially. It also represents the maximum food that is grown in its terrain i.e. 29% of the total food items identified. Its total transport (78%) is more than the average of 5 districts (57) .

Second largest food export is shown by Rewa with the total export of 149 items i.e. 64% of total identified food. This is followed by Satna, Panna and Niwari by 114, 112 and 104 items respectively

Table 15.9 : Food Transport Status

Districts	Food grown in the native	Food Brought from the market	Good grown here and is sent on commercial purpose	Total Export
Niwari	40	27	37	104
Panna	43	29	40	112
Rewa	51	50	48	149
Satna	42	32	40	114
Umaria	68	50	65	183
Total	49	38	46	132
%age	21%	16%	21%	57%

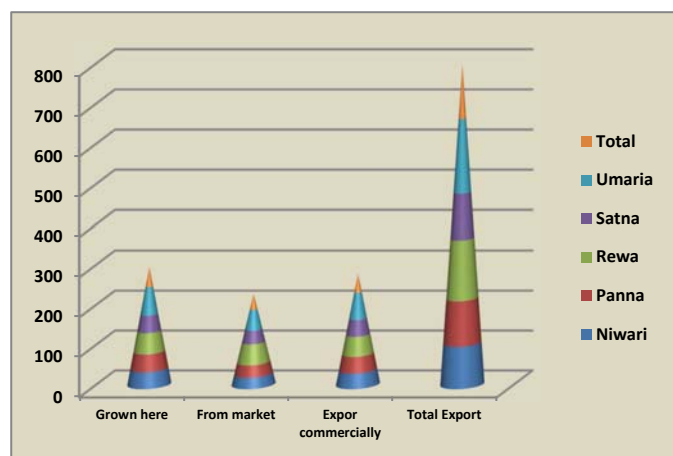


Figure 15.8: Food Transport Status

15.3. Pair-wise Ranking

The pair-wise ranking exercise is done through FGDs with a group of 20 women including pregnant, lactating, those belong to reproductive age, elderly, adolescent boys and girls, children (5-11 years)for likings and disliking towards traditional food. The exercise is done in all the ten villages where people were gathered and a list of all the traditional vegetables are shared for ranks and votes.

356 pairs and 712 votes were taken on yes and no against the list.

A total 67 traditional and local green leafy vegetables have been identified during this exercise and are well put in the local traditional calendar. Of 67 vegetables, 35 ranks have been recorded. Amongst which 90% of the vote have been casted for chana bhaji and it scored 320 votes out of 356 and ranked first in the system. The second rank is scored by methi saag with 182 votes (51%). This way the top ten vegetables are listed as 1. Chana 2. Methi 3. Palak 4. Sarson 4 Paroda (4th rank shared by two based on 148 votes) 5 Bathua 6 CHorai 7 Chench, 8 Nonia. 9 chakoda and 10 kankaua.(For rankings of 35 refer table 15.10)

The choices are made based on the taste and availability.

15.4. Scientific benefits of locally available food

The local and traditional foods are not important for their availability only but they do have some scientific benefits, which raise them on the top in food list. The health and nutrition benefits of all the identified 234 foods are presented in Annexure

Table 15.10 : Pair-wise Rank of Traditional foods

SN	Traditional food	Votes from	Total Votes	Difference	%age	Ranks	Niwadi			Panna			Rewa			Satna			Umaria		
							Pa	K	N	Ku	Ko	P	O	G	R	D	Kh	S	M	A	U
1	Chana	356	320	36	90%	1	29	29	58	15	28	43	33	38	71	39	32	71	34	43	77
2	Methi	356	182	174	51%	2	25	18	43	15	14	29		21	21	21	16	37	30	22	52
3	Palak	356	149	207	42%	3	21	19	40	15	16	31		18	18		22	22	16	22	38
4	Sarson	356	148	208	42%	4	30	6	36	15	13	28	29		29	19	16	35		20	20
5	Paroda	278	148	130	53%	4	35	25	60	15		15	20	18	38	19	16	35			0
6	Bathua	278	140	138	50%	5	16	17	33	7	16	23	29	18	47	21	16	37	0	0	0
7	Chorai	280	122	158	44%	6	7	7	14	15	14	29			0	20	17	37	19	23	42
8	Chench	278	120	158	43%	7	32	19	51		14	14		18	18	19	18	37			0
9	Nonia	278	116	162	42%	8	19	19	38	15	14	29		16	16	19	14	33			0
10	Chakoda	282	89	193	32%	9			0		11	11		14	14	16	15	31	13	20	33
11	Kankaua	300	86	214	29%	10	18	12	30			0	9	13	22			0	13	21	34
12	Mulipatta	282	85	197	30%	11			0		13	13			0	18	16	34	16	22	38
13	Phang	202	85	117	42%	11	24	24	48	15	5	20			0	17		17			0
14	Munga	210	79	131	38%	12			0		15	15	21		21			0	22	21	43
15	Kachhar	282	77	205	27%	13			0		12	12	19		19	2	4	6	18	22	40
16	koilar	210	71	139	34%	14			0		16	16	18		18			0	16	21	37
17	Karelia	204	71	133	35%	14			0		15	15	18		18	22	16	38			0
18	Bharauta	148	70	78	47%	15			0			0	18	17	35	16	19	35			0
19	Karela	148	63	85	43%	16			0			0	19	23	42	21		21			0
20	Lahsua	150	61	89	41%	17	16	21	37			0	8	16	24			0			0
21	Dangri	74	53	21	72%	18	18	35	53			0			0			0			0
22	Chandeli	74	48	26	65%	19	17	31	48			0			0			0			0
23	Bathri	78	42	36	54%	20			0			0			0			0	20	22	42
24	Lal Bhaji	78	40	38	51%	21			0			0			0			0	17	23	40
25	Jeelo	78	38	40	49%	22			0			0			0			0	14	24	38
26	Rai bhaji	78	36	42	46%	23			0			0			0			0	22	14	36
27	Chorba	76	36	40	47%	23			0			0	17	19	36			0			0
28	Kachnar Phal	72	36	36	50%	23			0			0			0	21	15	36			0
29	Palki	78	35	43	45%	24			0			0			0			0	14	21	35
30	Patharchata	78	33	45	42%	25			0			0			0			0	11	22	33
31	Akri	74	33	41	45%	25	16	17	33			0			0			0			0
32	Kumbhda	76	32	44	42%	26			0			0	22	10	32			0			0
33	Amta	78	30	48	38%	27			0			0			0			0	9	21	30
34	Bhindi	76	30	46	39%	27			0			0	0	30	30			0			0
35	Chirota	132	29	103	22%	28			0	12		12	17		17			0			0
36	Norpa	130	29	101	22%	28		16	16		13	13			0			0			0
37	Kajra	78	28	50	36%	29			0			0			0			0	19	9	28
38	Nari	74	27	47	36%	30	5	22	27			0			0			0			0
39	Punhaar	74	27	47	36%	30	12	15	27			0			0			0			0
40	Mukuyya	72	27	45	38%	30			0			0			0	27		27			0
41	Tipni	74	23	51	31%	31		23	23			0			0			0			0
42	Menhar	78	22	56	28%	32			0			0			0			0		22	22
43	Peenhri	78	22	56	28%	32			0			0			0			0		22	22
44	Amila	148	21	127	14%	33			0			0			0	21		21			0
45	Lonia	78	21	57	27%	33			0			0			0			0		21	21
46	Phutpura	78	21	57	27%	33			0			0			0			0		21	21
47	Aamla	76	21	55	28%	33			0			0	21		21			0			0
48	Kundru	76	19	57	25%	24			0			0		19	19			0			0
49	Marsa	76	19	57	25%	24			0			0		19	19			0			0
50	Dudhiya	76	18	58	24%	25			0			0		18	18			0			0
51	Seori	76	18	58	24%	25			0			0		18	18			0			0
52	Guliya	76	17	59	22%	26			0			0		17	17			0			0
53	Kosam	72	17	55	24%	26			0			0			0	17		17			0
54	Boni	76	16	60	21%	27			0			0	16		16			0			0
55	Sevta	76	16	60	21%	27			0			0	16		16			0			0
56	Kachnar	72	16	56	22%	27			0			0			0	16		16			0
57	Khakoodan	56	15	41	27%	28			0		15	15			0			0			0
58	Poi	56	15	41	27%	28			0	15		15			0			0			0
59	Silwari	78	14	64	18%	29			0			0			0			0	14		14
60	Bareli	74	14	60	19%	29	14		14			0			0			0			0
61	Kakoda	56	14	42	25%	29			0		14	14			0			0			0
62	Sarita	72	12	60	17%	30			0			0			0		12	12			0
63	Chimrai	76	10	66	13%	31			0			0	10		10			0			0
64	Chirchira	78	9	69	12%	32			0			0			0			0	9		9
65	Amarbel	74	6	68	8%	33	6		6			0			0			0			0
66	Hirar	74	5	69	7%	34		5	5			0			0			0			0
67	Kataiyya	72	1	71	1%	35			0			0			0	1		1			0

IV. Nutrient and Dietary Analysis

The nutrient and dietary analysis encompass the process of determining the nutrient contents of the food along with the nutrient intakes/ consumption by particular group/community.

This section deals with the detailed food consumption, nutrient intake through foods by community – Pregnant and lactating mothers, Adolescent girls and Children 6-24 months of age, as studied; and nutrient analysis

16. Chapter Sixteen – Food Security

This chapter broadly analyzes the Food security of the community and the food consumption pattern that would further accentuate the amount and the quantity the food is consumed by what degree and by what type.

Food security exists when all people at all times have physical, social and economic access to sufficient, safe and nutritious food to meet their dietary needs and food preferences for an active and healthy life. The four pillars of food security are: food availability, access to food, utilization and stability. The nutritional dimension is integral to the concept of food security³²

Four elements build the framework of food and nutrition security: availability, access, use and utilization, and stability. The picture below illustrates the three dimensions describing the food flow from availability and access to use and utilization as well as the aspect of sustainability

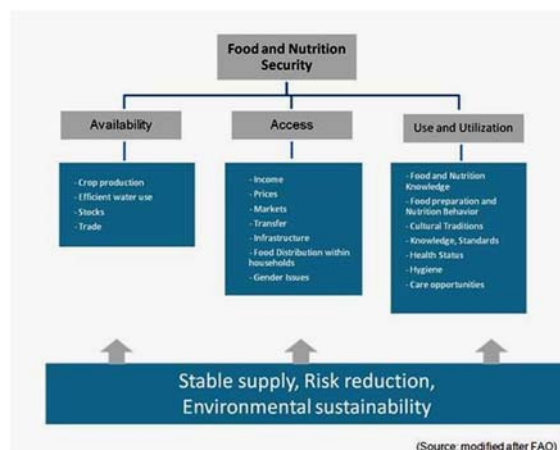


Figure 16.1: Dimensions of Food security.

16.1. Food Availability

Availability refers to the physical existence of food. On national level food availability is a combination of domestic

food production, commercial food imports and exports, food aid and domestic food stocks.

On household level food could be from own production or bought from the local markets. Regarding food production, water resources are required to produce the crops. Due to population growth and climate change, the pressure on existing natural resources, namely land and water, increases. Impacts of climate change are often leading to land degradation, lack of irrigation water, reduced soil moisture and therefore losses of economic livelihoods.³³

Food availability in this chapter is focused on the production and market brought things

The details of food availability is shown through Table 16.1 and figure 16.2

16.1.1. Food Harvesting

Food group wise harvesting cost is provided in Table 16.1

As shown in the table the harvesting is done in four major food groups including cereals and grains, pulses and legumes, millets, roots and tubers, GLVs to certain extent through kitchen garden or conventional farming practices.

The detailed food production is discussed in section 8.3.1. Wherein the cost of all the crops is calculated and is presented for the districts.

The harvesting cost on cereals and grains is computed as 5225 INR per household and that of pulses is 4968. The millet cost around 3840 INR whereas roots and tubers cost them around 2500 INR.

This is the production cost to be borne by the farmers on an acre of land, provided irrigated fields. The rest of the food items are consumed from the market or collected from the jungle and nearby farms.

The list of harvested, purchased and collected foods are shown in table 16.1 and figures 16.3

³² Committee on World Food Security (CFS), Global Strategic Framework for Food Security and Nutrition, 2011 (http://www.fao.org/fileadmin/templates/cfs/Docs1011/WG_GSF/GSF_annotated_outline_formatted_Rev1_22_Jun_11.pdf)

³³ SIWI, IFPRI, IUCN, IWMI. 2005. "Let it Reign: The NewfckLRWater Paradigm for Global Food Security." FinalfckLRReport to CSD-13. Stockholm International WaterfckLRInstitute, Stockholm.

Table 16.1: Harvested, Purchased and collected Foods

SN	Food Groups	Purchase /HH/Month in kgs	Total production	Use for Household Consumption kgs/ months	Quantity Sold	Cost per unit (selling price)	Total cost of production	Total income	Profit (+) / Loss(-)	Collection	Use for Household Consumption kgs	Quantity Sold	Cost per unit (selling price)	Total income	Market rate	Value saved
1	Cereals	36.1	459.8	16.5	262.2	36.9	7703.2	9688.8	1985.6	0.0	0.0	0.0	0.0	0.0	15.0	0.0
2	Egg	15.5	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5.0	0.0
3	Vegetables	13.5	4000.0	3.3	3960.0	12.0	29450.0	47520.0	18070.0	4.0	4.0	0.0	0.0	0.0	20.0	0.0
4	Roots/Tubers	12.6	1000.0	4.2	950.0	10.0	20500.0	9500.0	-11000	4.0	4.0	0.0	0.0	0.0	20.0	0.0
5	GLV	11.7	0.0	0.0	0.0	0.0	0.0	0.0	0.0	4.0	4.0	0.0	0.0	0.0	20.0	0.0
6	Milk	10.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	50.0	0.0
7	Oil	5.9	368.5	11.8	227.0	36.7	6839.9	8340.4	1500.5	4.0	0.0	2.0	0.0	0.0	100.0	60.0
8	Pulses/Leg.	4.8	727.3	23.5	444.7	73.6	13608.1	32749.4	19141.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0
9	Sugar	3.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
10	Fruits	3.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	2.0	0.0	0.0	0.0	0.0	0.0
11	Fish	2.4	0.0	0.0	0.0	0.0	0.0	0.0	0.0	2.0	24.0	24.0	0.0	0.0	0.0	600.0
12	Meat/Poultry	2.3	0.0	0.0	0.0	0.0	0.0	0.0	0.0	28.0	5.0	0	0.0	0	0.0	0.0
13	Millets	2.0	459.8	16.5	262.2	36.9	7703.2	9688.8	1985.6	1.0	12.0	12.0	0.0	0.0	0.0	2400.0

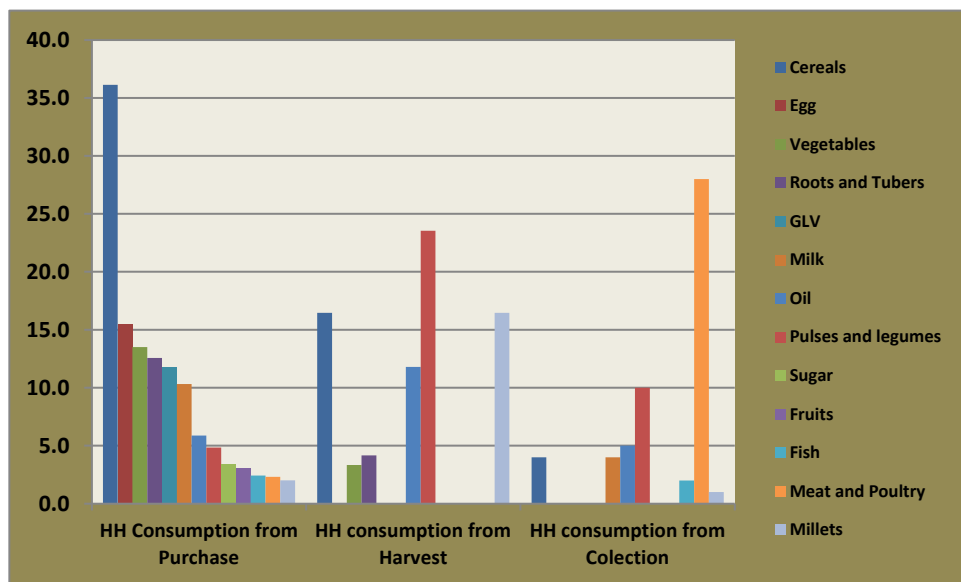


Figure 16.3: Household consumptions from Purchase, Harvest and Collection

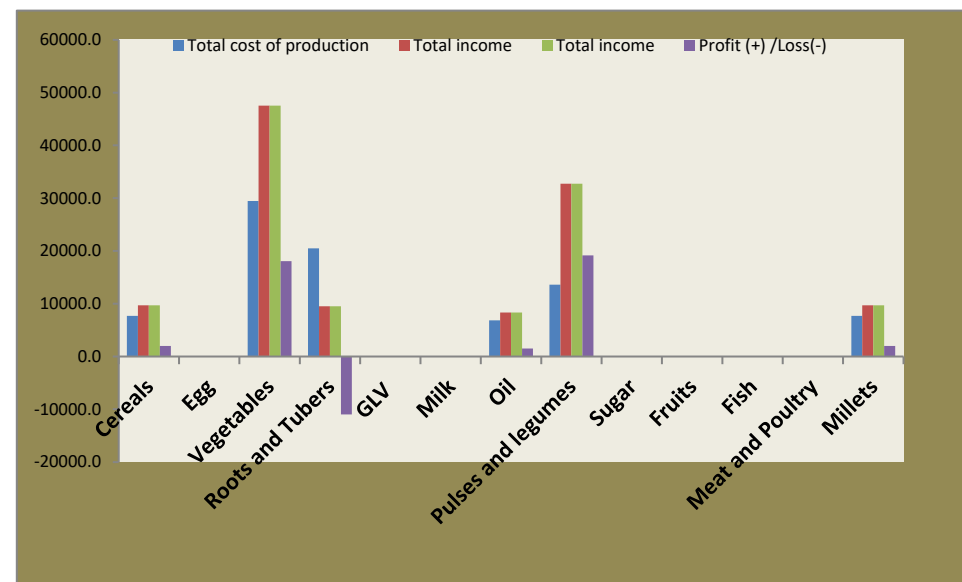


Figure 16.2 : Cost of production and Profit and loss

16.1.2. Purchase and Collection

As demonstrated in the table, the availability incurred upon the production, the collection and the purchase through which a food is available to a plate. All these three determinants of availability is explained under this section. The total household consumption that comes from purchase is 123.7 kilograms of food including all the food groups like cereals, millets, vegetables, milk and milk products, pulses legumes etc. against the total quantity that is consumed from the production of about 75.8 kilograms and that from collection is 54 kilograms in winter making the total consumption of 253.5 kgs per household per month,

Amongst this the cereal consumption is computed as 57 kgs including both wheat and rice. This is followed by roots and tubers and GLVs which is consumed the most and very low quantity of other food groups are consumed

The total production cost as computed for different food group per household is also demonstrated though this table. The detailed analysis of the food groups production cost, cost per unit, income and profit and loss is already explained in section- 8.3.1 and table 8.3

16.2. Food Access

Access is ensured when all households have enough resources to obtain food in sufficient quantity, quality and diversity for a nutritious diet. This depends mainly on the amount of household resources and on prices. In addition, accessibility is also a question of the physical, social and policy environment. Drastic changes in these dimensions may seriously disrupt production strategies and threaten food access of affected households.³⁴

Food accessibility in this study is defined as allocation and sources, through which the food reaches the individual's plate. It determines whether the food is harvested, collected, purchased.

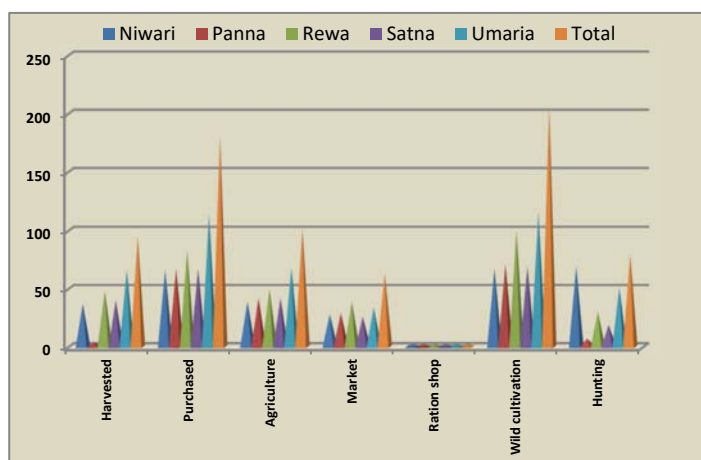


Figure 16.4: Measures of Food Access

³⁴ USAID 1995 Food Aid and Food Security Policy Paper, (<http://transition.usaid.gov/policy/ads/200/foodsec/foodsec.pdf>)

16.2.1. Measures of food accessibility

Broadly explained through Table 16.4 and figure 16.2, are measures practiced in the field – harvested, purchased or collected. As shown in table 77% of the total foods identified is purchased compared to 41% those have been harvested against 40% collected foods from forest, farms and wild cultivation. Same linear fashion is observed in this segment also that, Umaria shows the highest trend in Harvested, purchased and collected foods

Districts	Harvested	Purchased	Collected
Niwari	37	66	27
Panna	4	67	26
Rewa	48	83	39
Satna	40	67	26
Umaria	66	114	47
Total	95	180	94
%age	41%	77%	40%

Table 16.2: Measures of Food accessibility

Rewa comes second, where 48 items are harvested, 83 are purchased and 39 are collected. This is followed by Satna and Panna in terms of purchased and collected foods where as Panna has shown lowest trend in regards to harvested traditional food where as Niwari shows the lowest where any food from wild or forests are collected or in purchased food category.

16.2.2. Sources of Food Access

Table 16.3 and figure 16.4 show that the highest point for food access is wild cultivation. 76% of the identified food is collected from the nearby forests and farms. 23% of the food access is dependent on the market where at least 63 items are purchased from the market.

At least 1-1.5% of the food stuffs are also bought from the PDS shops. Somewhat 29% hunting is still observed for eggs/fish/poultry/meat from wild and forests.

Amongst the districts the highest percentages are recorded for Umaria with 71% of wild cultivation and collection then 31% for hunting and 21% for market dependency.

Followed by this comes Rewa where wild cultivation is recorded as 67%; hunting as 20% and market dependency as 26%. Panna records the least, only 7 items from hunting and Niwari records the least i.e. 28 for market dependency

16.3. Food Distribution

Food distribution is regarded to a process through which any general public is supplied with food and is affected by a number of factors including food availability, food supply, income and purchasing power, bargaining power, access to

food resources, food behaviors, social status, tastes and preferences, and interpersonal relationships.

Similarly plenitudes of factors responsible for Household food distribution that includes, wealth, food security, occupation, land ownership, household size, religion/ ethnicity / caste, education, and nutrition knowledge³⁵

Table 16.4: Sources of Food access

Districts	Niwari	Panna	Rewa	Satna	Umaria	Total	%age
Market	28	29	39	26	34	63	23%
%age	24%	25%	26%	23%	21%	23%	0%
Ration shop	2	2	2	2	2	2	1%
%age	2%	2%	1%	2%	1%	1%	0%
Wild cultivation	67	71	100	69	116	206	76%
%age	58%	62%	67%	61%	71%	76%	0%
Hunting	69	7	30	19	51	79	29%
%age	59%	6%	20%	17%	31%	29%	0%

In this study the food distribution focus on the Households and individuals food allocation on per capita basis.

The table and figure show the food distribution and allocation of identified foods into different groups by different categories that includes –

- (i) Quantity required for a day (kgs)
- (ii) Frequency in a week in number (Number)
- (iii) Frequency in month (Number)
- (iv) Quantity consumed in kgs on monthly basis (kgs)
- (v) Quantity consumed by each member in kgs on monthly basis
- (vi) Serving size (KGs)
- (vii) Number of servings by each member on monthly basis (Number)
- (viii) Number of months the food is consumed (Number)
- (ix) Frequency yearly basis (Number) 10. Quantity consumed by family in a year (kgs)

These categories determine the intake of food per capita on monthly and daily basis by individual and households

Table 16.3 : List of wild cultivation

Fruits	GlV	Vegetables	Roots and tubers	Ntfp
Bahera	Bathua	Ban bhindi	Angeetha	Achar
Akola	Chench	Barbati	Arbi	Amla
Ban angur	Chorai	Bhindi	Gainthi	Bel
Ban kachariya	Amaltas	Lauki	Ghuguchi	Gulli
Chindi	Amta	Palas	Ratalu	Gulli ka tel
Dhaman	Bramhi	Paroda	Bad/bar	Tendu
Goolar	Chachinda	Sangri	Badki kanda	Tendu patta
Gulasi	Chamrai	Baigan	Bakaina	Herb
Harra	Curry neem	Ban bhata	Baseeda	<i>Kaitha</i>
Ber	Kachnar	Bondi	Bilaikand	<i>Chirota</i>
Jungle jalebi	Karol	Gilki	Bitti kanda	<i>Dudhia</i>
Kachariya	Katili chaurai	Gobhi	Gajar	<i>Patherchatta</i>
Kachua,	Khatta palak, khatua	Gullakdi	Gilchi	Shrub
Kakai		Hari pyaz	Gursakri	<i>Karonda</i>
Bihi	Mooli patta	Kaddu	Kamalkand	Stems
Kathjamun	Nagphani	Karela	Kathal	Babool
Ketha	Palak	Karelia	Khamhar	Weed
Khirni	Pinhiri	Kumhdha	Mooli	<i>Chakoda</i>
Kosam	Poi	Matar	Satawar	
Menhar	Poudina	Munga	Shakarkand	
Neem ka phal	Punaar	Risua	Suar kanda	
Papita	Kankaua	Sem	Suran	
Penhta	Sarita			
Rajmukod	Sarso			
Safed musli	Koilar			
Seetaphal	Laalbhaji			
Singhara, kaudi	Lahsua			
Sukhari	Methi			
Ghui	Mukuiyya			
Imli	Nari			
Jamun	Nonia			
Kakdi	Norpa			
Kataiyya	Phang			
Khajoor	Rai bhaji			
Kundru	Midnight creeper			
Makor				

³⁵ Determinants of intra-household food allocation between adults in South Asia – a systematic review , H-Harris et al, International Journal for Equity in Health volume 16, Article number: 107 (2017)

16.3.1. Portion distribution of a plate

All the quantities are described in kilograms. On an average household size of 4.9, the portion of a plate for a household, on full meal day basis, comes 10% from cereals; 6% from vegetables; 8% from millets; 5% from fish 4% from tubers and 3% each from eggs, poultry and meat, NTFPs, shrubs, weeds and fruits.

The distribution changes when consumption is analyzed per individual per day which is same for per household per month. The portion of the plate is made up of 23% of cereals, 16% GLV, 12% millets, 15% herbs, 5% of vegetables merely 2% each of pulses and legumes or fish and negligible amount of fruits.

16.3.2. Frequency

Cereals including rice and wheat along with green leafy vegetables and millets (regions wherever available) are consumed on daily basis, whereas roots and tubers, herbs, green leafy vegetables and seasonal vegetables are consumed thrice a week. Potato remains exception in all the regions and is consumed 4-6 times in a week. However all the non-vegetarian consumes are eaten once a week provided the availability and budget.

16.3.2.1. Traditional Millets

Kodo kutki, corns and sanwa, are consumed in Umaria whereas, Kakun and Bajra are consumed in Satna. Maize are consumed largely by all the districts. In season these are eaten atleast twice. However, in Umaria the frequency is higher for Kodo kutki and sanwa i.e. on daily basis. In one go 2-2.5 kgs of millets are prepared making the total requirement of 15-20 kgs in a month. Maize and bajra is however required 5-7 kgs in a month.

16.3.2.2. Traditional Green leafy vegetables

All the wildy cultivated GLVs are consumed largely by the natives and are eaten atleast thrice a week. On an average 1.5-2 kgs of GLVs is required for one time. This contributes to total requirement of 24 kilograms a month and individual might get upto 4.8 kgs.

The GLVs consumed are *Ramtila, Alsi, Amaltas, Amla, Bathua, Bramhi, Chachinda, Chamrai, Chench, Chorai, Curry Neem, Kachnar, Kankaua, Karol, Khatta Palak, Khatua, Koilar, Laalbhaji, Lahsua, Methi, Mukuiyya, Nagphani, Nari, Nonia, Norpa, Palak, Phang, Pinhiri, Poi, Poudina, Punaar, Rai, Rai Bhaji, Sarita, Sarso, Sarson, Katili Chaurai, Midnight Creeper, Sesame, Mooli Patta.*

These are collected wildy and the procedure for cooking these has been simple in a plain vegetable form.

16.3.2.3. Traditional Roots and Tubers

Traditional roots and tubers including aaloo, *Angeetha, Arbi, Bad/Bar, Badki Kanda, Bakaina, Baseeda, Bilaikand, Bitti Kanda, Gainthi, Gajar, Ghuguchi, Gilchi, Gursakri, Kamalkand, Kathal, Khamhar, Mooli, Ratalu, Satawar, Shakarkand, Suar Kanda, Suran*, are consumed once a month only. The quantity required in one time is only half kilograms, except for potato which is consumed largely.

16.3.2.4. Traditional Fruits

Traditional fruits as identified from fields are *Aam, Akola, Bahera, Ban Angur, Ban Kachariya, Ber, Bihi, Chindi, Dhaman, Ghui, Goolar, Gulasi, Harra, Imli, Jamun, Jungle Jalebi, Kachariya, Kachua, Kakai, Kakdi, Kataiyya, Kathjamun, Ketha, Khajoor, Khirni, Kosam, Kundru, Makor, Menhar, Neem Ka Phal, Papita, Penhta, Rajmukod, Safed Musli, Seetaphal, Singhara, Kaudi, Sukhari.*

These are consumed atleast thrice a month atleast 1 kilograms in one time. Mostly consumed raw except for fruits like amla which are kept dried, powdered, and some special chutneys and murabbas.

16.3.2.5. Traditional Fish

Chamni, Chandeni, Channa, Chilhati, Chinga, Chingadha, Drai, Fish, Garhni, Gohariya, Gulhun, Khadayya, Kusma, Manja, Mirgal, Sakari, Sambal, Bam, Chalia, Chigul, Dedka, Katla, Katua, Kechuhi, Marahu, Rusi, Seori, Sindhi, Tigna, Tingar, Jheenga, Kachua, Kekda, Magur, Padhin, Rohu, Sora, are some forms of traditional fish as spotted.

These are consumed in fairly large amount compared to other non-vegetarian foods, provided the water-sources like in Umair, Rewa and Niwari, wherein these are cooked atleast 1kgs in one time, thrice a week.

16.3.2.6. Traditional Meat and Poultry

The common consumable identified meat from the field are *Barasingha, Bhed, Cheetal, Chinkara, Goh, Hiran, Jangli Suar, Khargosh, Neelgaye, Sambhar, Sehi, Suar, Barahsingha, Goh* and poultry are *Batakh, Bater, Desi Murgi, Dokia, Jal Murgi, Kabootar, Lava, Mor, Murga, Murgi, Teetar, Van Murgi, Jalmurgi, Vanmugi.*

These are consumed once in a season apart from the regular meat of Goat, hens, fowls etc, provided the availability. The normal requirement is 1 kg at a time making the distribution of 200gms per head on average of 5 individual per household.

16.3.2.7. Traditional herbs, shrubs and weeds

Chirota, Dudhia, Kaitha, Patherchatta, Chakoda, Sugarcane, Karonda, Babool, are the commonly consumed herbs, shrub and weeds. Chirota and chakoda bhaji is fairly liked by the natives and are consumed atleast twice a week during the season. Frequency of different food groups and the quantity required is displayed in Table 16.5.

Food distribution is explained in detailed in Table and figure 16.5

Table 16.5 : Food Distribution

SN	Food Groups	1. Quantity required for a day (kgs)	2. Frequency in a week in number (Number)	3. Frequency in month (Number)	4. Quantity consumed in kgs on monthly basis (kgs)	5. Quantity consumed by each member in kgs on monthly basis	6. Serving size (KGs)	7. Number of servings by each member on monthly basis (Number)	8. Number of months the food is consumed (Number)	9. Frequency yearly basis (Number)	10. Quantity consumed by family in a year (kgs)
1	Cereals	2.15	7.00	4.00	60.20	12.29	0.10	122.86	12.00	1474.29	722.40
2	Egg	1.00	7.00	4.00	28.00	5.71	0.15	38.10	12.00	457.14	336.00
3	Fish	2.00	7.00	4.00	56.00	11.43	0.25	45.71	12.00	548.57	672.00
4	Fruits	2.00	3.00	4.00	24.00	4.90	0.12	40.82	3.00	122.45	72.00
5	GLV	0.50	3.00	4.00	6.00	1.22	0.10	12.24	12.00	146.94	72.00
6	Herb	1.00	3.00	4.00	12.00	2.45	0.10	24.49	4.00	97.96	48.00
7	Meat	2.00	3.00	4.00	24.00	4.90	0.12	40.82	3.00	122.45	72.00
8	Millets	1.00	2.00	4.00	8.00	1.63	0.12	13.61	3.00	40.82	24.00
9	NTFP	2.00	2.00	6.00	24.00	4.90	0.06	81.63	4.00	326.53	96.00
10	Poultry	0.50	1.00	1.00	0.50	0.10	0.12	0.85	1.00	0.85	0.50
11	Pulses and legumes	1.00	1.00	3.00	3.00	0.61	0.10	6.12	4.00	24.49	12.00
12	Roots and Tubers	0.50	1.00	3.00	1.50	0.31	0.12	2.55	3.00	7.65	4.50
13	Shrub	1.00	1.00	1.00	1.00	0.20	0.12	1.70	5.00	8.50	5.00
14	Stems	0.50	1.00	1.00	0.50	0.10	0.12	0.85	1.00	0.85	0.50
15	Vegetables	0.50	1.00	2.00	1.00	0.20	0.06	3.40	4.00	13.61	4.00
16	Weed	0.50	1.00	1.00	0.50	0.10	0.06	1.70	4.00	6.80	2.00

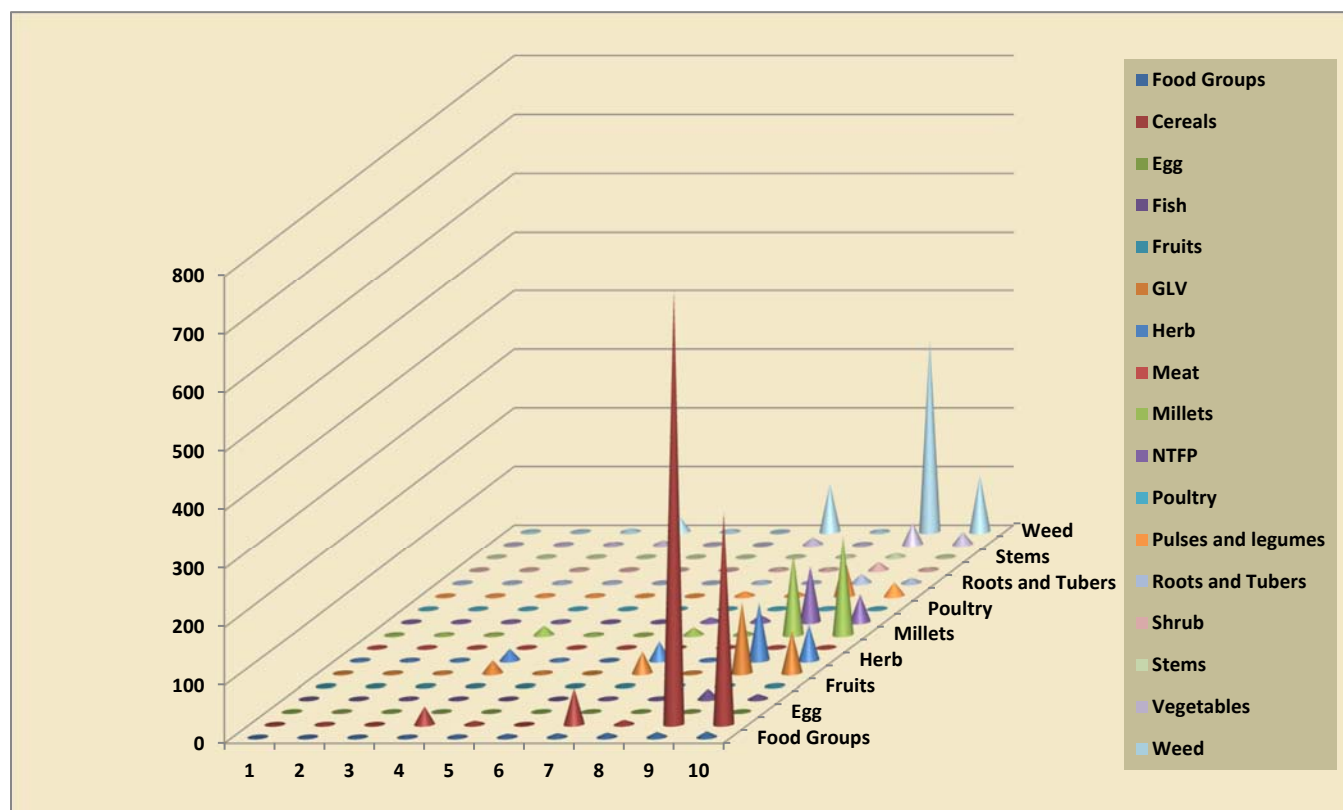


Figure 16.5: : Food distribution of different groups

Table 16.6: Food Consumption Pattern

SN	Particulars	Cereals	Egg	Vegetables	Roots and Tubers	GLV	Milk	Oil	Pulses and legumes	Sugar	Fruits	Fish	Meat and Poultry	Millets	Total
1	Purchase quantity	36.1	15.5	13.5	12.6	11.7	10.3	5.9	4.8	3.4	3.0	2.4	2.3	2.0	123.7
2	Harvest Quantity	16.5	0.0	3.3	4.2	0.0	0.0	11.8	23.5	0.0	0.0	0.0	0.0	16.5	75.8
3	Collected Quantity	0.0	0.0	4.0	4.0	10.0	0.0	0.5	0.0	0.0	2.0	5.0	0.0	0.0	25.5
4	Total quantity	52.6	15.5	20.8	20.7	21.7	10.3	18.2	28.4	3.4	5.0	7.4	2.3	18.5	225.0
5	Cost/Unit/ purchase	2.0	6.0	20.0	20.0	20.0	50.0	100.0	100.0	40.0	70.0	100.0	200.0	120.0	848.0
6	Cost/unit/harvesting	16.8	0.0	7.4	20.5	0.0	0.0	18.6	18.7	0.0	0.0	0.0	0.0	16.8	98.6
7	Cost per unit	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
8	Total cost	18.8	6.0	27.4	40.5	20.0	50.0	118.6	118.7	40.0	70.0	100.0	200.0	136.8	946.6
9	Total cost/Unit	18.8	6.0	27.4	40.5	20.0	50.0	118.6	118.7	40.0	70.0	100.0	200.0	136.8	946.6
10	Serving size	0.1	1.0	0.1	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.1	0.1	0.1	2.2
11	4. Price per serving	2.3	6.0	3.3	4.9	2.0	6.0	1.2	14.2	0.4	8.4	12.0	24.0	16.4	101.0
12	Quantity consumed by members/month	10.7	3.2	4.3	4.2	4.4	2.1	3.7	5.8	0.7	1.0	1.5	0.5	3.8	45.9
13	Purchase	72.3	93.1	270.1	251.3	234.8	516.0	588.0	483.1	136.8	212.5	242.5	463.2	240.8	104901.0
14	Harvest	275.8	0.0	24.5	85.4	0.0	0.0	218.9	440.6	0.0	0.0	0.0	0.0	275.8	7473.8
15	5. Price per member	201.3	19.0	116.4	171.4	88.7	105.3	439.8	687.5	27.9	71.9	151.5	94.5	515.5	2690.7
16	6. Price per Household (Monthly)	348.1	93.1	294.7	336.7	234.8	516.0	806.9	923.7	136.8	212.5	242.5	463.2	516.6	112374.8
17	7. Price per HH (Annually)	4176.9	1117.7	3536.1	4041.0	2817.8	6192.5	9683.4	11084.3	1641.5	2550.2	2910.6	5557.8	6199.4	61509.2

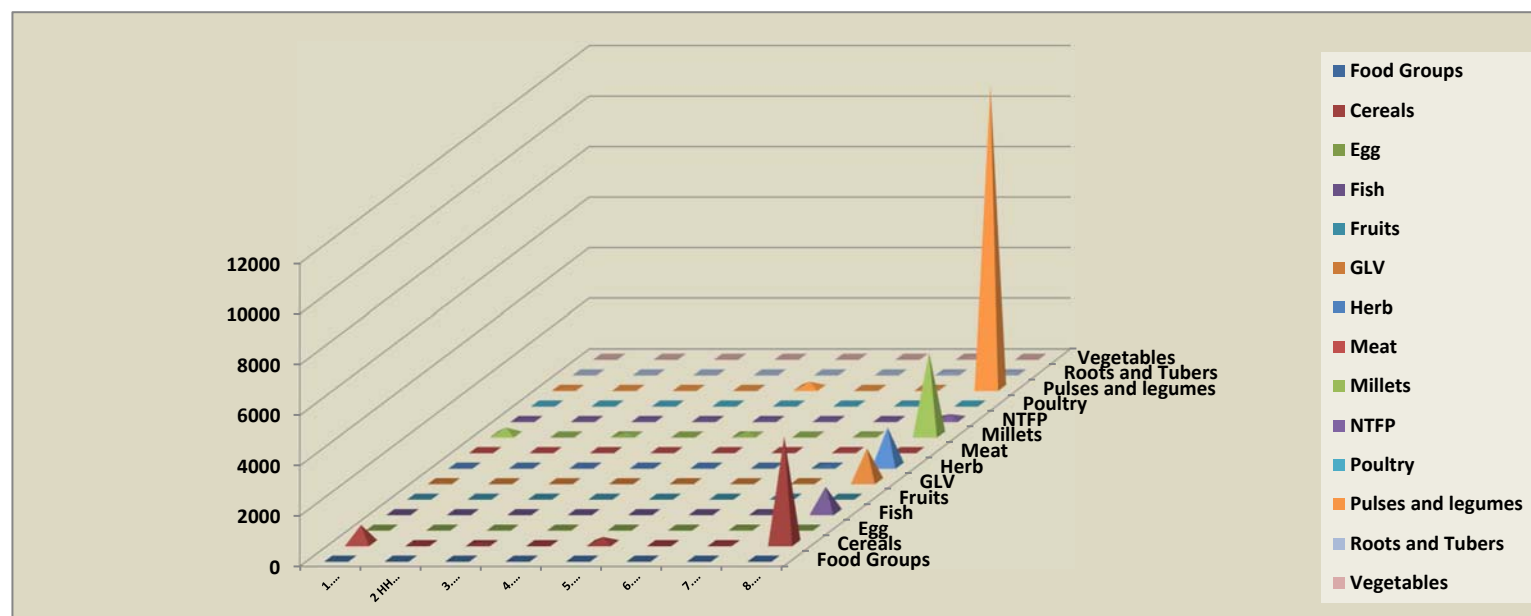


Figure 16.6: Food Consumption Pattern

16.4. Food Consumption

The food consumption patterns focuses on the quantity the food is consumed simultaneously analyzing the cost of the food, thus giving an insight to per capita values. The table and figure 16.6 demonstrate the food consumption pattern as recorded for all the five districts in the current study.

16.4.1. Food consumption pattern of Household

The monthly consumption is analyzed against annual consumption for individual and the household along with serving unit and its quantity. Per-capita basis price is also illustrated here.

As shown the monthly consumption of all the food groups is accounted to 225 Kilograms, in which major chunk of 23% is contributed by cereals of about 53 kgs; 21 kgs each are contributed from roots and tubers and other vegetables (9%); 13% is made from Pulses for those who have been growing this crop for others landless farmers it is almost negligible; 10% is contributed by GLVs and 8% each is contributed by millet and oils.. Fish meat, poultry are once in a while products and are consumed as low as 2-3 % however comparatively eggs are consumed for about 7%. Sugar and fruits are lesser contributors to the HH consumption for about 2% only

16.4.2. Serving size

The serving size computed in the field is recorded in table 16.6 and figure 16.7

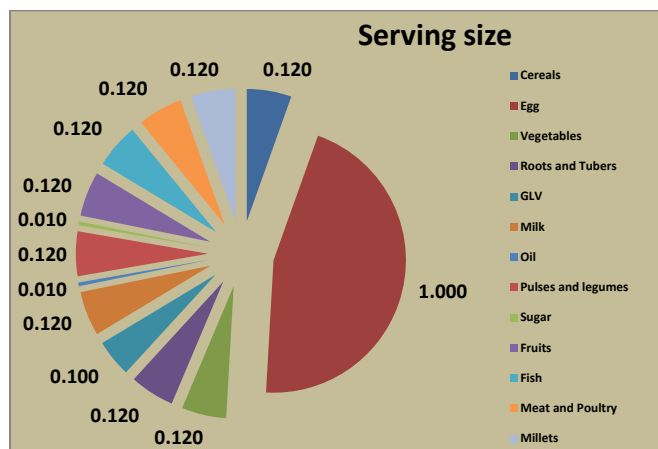


Figure 16.7 : Serving size

The serving size for all the food groups is considered almost same except for oil. In one serving he community is having 120 grams of portion at a time. Their tablespoon basically weighs for about 60 grams in one serving all the village dwellers tend to have two tablespoon at a time. For milk and tea small cup is preferred which is half the 250 gram i.e. 120 grams.

16.4.3. Food consumption patter of an Individual

The total quantity consumed in a day is computed as 1.5 kgs provided all the food groups on a plate wherein, the total cereal consumption of a day is computed as 358 grams and glvs, root and tubers and other vegetables as 142 grams others are consumed as lesser a 50 grams. Except for pulses, which on a normal healthy pulse day is consumable upto 193 grams.

16.4.4. Price analysis

Price analysis is done per serving by individual; per individual; per Household in a month; Per household in an year and is demonstrated in figure 16.8

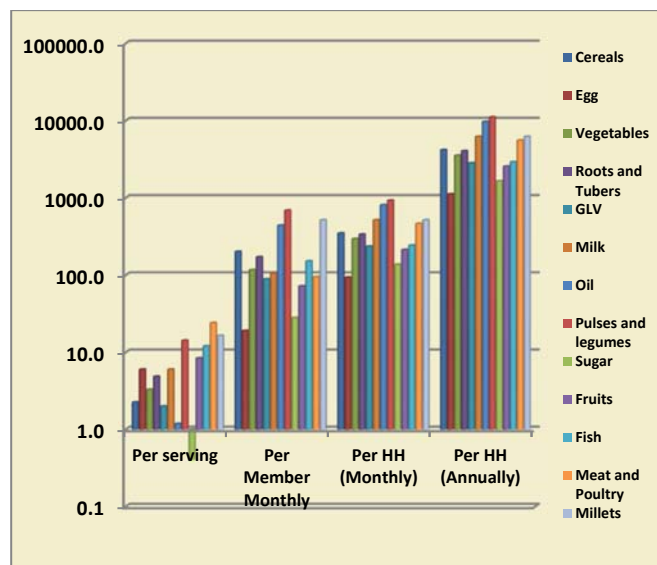


Figure 16.8 : Cost analysis of food groups consumed

The total cost for consuming 1.5 kgs of food on a healthy day, the cost is computed as 89 rupees and 70 paise only for a whole day diet, whereas on a monthly basis, the total cost incurred by an individual is 2690 INR. For a household it is computed as 5125 inr per month and 61509 inr for a year.

17. Chapter Seventeen – Dietary Analysis

17.1. Dietary Analysis of Children (06-24 months)

The dietary analysis is done through 24 hours dietary call. For children belong to 6 months-24 months, questionnaire was administered to their mothers.

The repetitive three days dietary call was taken to ensure the authenticity of data. This way diet of 50 children (10 from each districts) were assessed and further they were grouped into age categories – 6-12 months and 13-24 months.

17.1.1. Complimentary food (0-6 months)

The solid food introduced at the onset of 6 months to babies in order to provide them with additional nutrients, is termed as complimentary food. The complimentary food includes all the food groups with soft consistency in the first 6 months of introduction and later on to full fledged diet.

17.1.1.1. Milk other than breastmilk

The status of the whole milk introduced during complimentary feeding is provided in table and figure 17.2

Table 17.1: Status of whole milk

Districts	Whole milk	Mean Age of feeding whole milk	SD of Age of feeding whole milk	If receiving at the time the study was conducted
Niwari	60%	7.5	1.2	5
Panna	90%	7	2.7	8
Rewa	30%	8.5	2.1	3
Satna	40%	4	2.7	4
Umaria	20%	2	0.7	2
Total	48%	5.8	9.3	22

17.1.1.1. Number of children consuming whole milk

As explained briefly, the mean percentage of the family providing whole milk to the children apart from breastmilk is computed as 48% of the entire surveyed children (where n =50). The maximum percentage is reported by Panna (90%) and the lowest recorded number is observed in Umaria where only 20 % of the entire surveyed population is receiving whole milk

17.1.1.2. Mean age of feeding whole milk

Mean age of feeding whole milk is computed as 5.8 months, i.e. before the completion of six months in case of all districts. However, in Niwari, Panna and Rewa it was introduced after 7 months whereas in Umaria and Satna it was introduced before 4 months

17.1.1.2. Forms of Complimentary food

Based on the consistency the food forms are categorized broadly into solid, semi-solid and liquid forms and is explained in Table and figure 17.1

Table 17.2 : Forms of complimentary food

Districts	Solid (Cereals, Millets, Nuts and Oil Seeds)	Semi-solid (Fruits and Vegetables)	Liquid (Pulses, Fats, Poultry and meat)	Total
Niwari	9	4	8	7
Panna	2	5	3	3
Rewa	9	7	9	8
Satna	7	3	6	5
Umaria	8	7	8	8
Total	35	26	34	32
%age	70%	52%	68%	63%

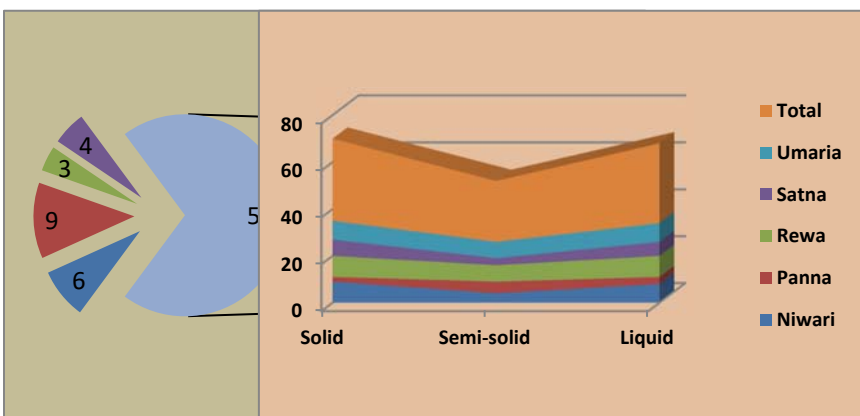


Figure 17.1: Forms of Food
Figure 17.2: Whole milk as consumed by infants

As demonstrated there are 70% of total families have been providing the solid foods only where as 52% are providing the semi-solid food in the forms of fruits and vegetables and 68% are giving only liquids in the forms of pulses .

Amongst the districts 90% of the food in Niwari is provided with solid consistency and only 10% are providing the semi-

solid. In Rewa however, 70% of the families are providing semi-solid food

17.1.2. Foods consumed (6-24 months)

All the food groups as included in the diet of the children and infants are provided in detail in Table and figure 17.3

Table 17.3: Average intake of food by children 6-24 months where n=50

Districts	Age	Cereals and grains	Millets	Pulses and legumes	Dark Green leafy vegetables	Other vegetables	Nuts and oilseeds	Meat and poultry	Fish and trout	Milk and Milk Products	Fats and oils	Fruits	Sugar Products	NTFP	biscuit 1 biscuit = 5.5 gms	kurura = 1 packet = 30 gms
Niwadi	6-12	1.2	0.1	0.1	0.3	0.7	0.2	0.3	0.1	0.6	0.0	0.3	0.0	0.0	6.7	0.6
Niwadi	13-24	1.5	0.3	0.2	0.4	0.9	0.3	0.5	0.2	0.9	0.0	0.4	0.1	0.0	8.8	0.8
Niwadi	SD	0.6	0.3	0.2	0.3	0.4	0.2	0.5	0.2	0.7	0.0	0.3	0.0	0.0	4.2	0.5
Panna	6-12	0.7	0.1	0.0	0.4	0.5	0.2	0.1	0.3	1.0	0.0	0.3	0.1	0.1	3.3	0.0
Panna	13-24	0.8	0.3	0.0	0.6	0.7	0.3	0.3	0.5	1.3	0.0	0.3	0.1	0.1	5.7	0.0
Panna	SD	0.2	0.3	0.0	0.5	0.4	0.2	0.3	0.3	0.5	0.0	0.1	0.0	0.2	4.7	0.0
Rewa	6-12	0.7	0.0	0.0	0.1	0.5	0.1	0.3	0.1	0.3	0.0	0.0	0.0	0.0	6.0	0.5
Rewa	13-24	0.8	0.0	0.0	0.1	0.6	0.2	0.5	0.2	0.5	0.0	0.1	0.0	0.0	8.4	0.7
Rewa	SD	0.2	0.0	0.0	0.2	0.3	0.2	0.4	0.2	0.4	0.0	0.1	0.0	0.0	4.9	0.4
Satna	6-12	0.7	0.0	0.0	0.1	0.3	0.0	0.2	0.0	0.5	0.0	0.0	0.0	0.0	3.9	0.3
Satna	13-24	0.8	0.1	0.0	0.2	0.5	0.1	0.4	0.1	0.7	0.0	0.1	0.0	0.0	6.2	0.5
Satna	SD	0.3	0.1	0.0	0.2	0.4	0.1	0.3	0.1	0.4	0.0	0.1	0.0	0.0	4.5	0.4
Umariya	6-12	0.6	0.2	0.0	0.3	0.4	0.4	0.2	0.2	0.3	0.0	0.2	0.0	0.3	3.4	0.5
Umariya	13-24	0.7	0.3	0.0	0.5	0.6	0.5	0.4	0.4	0.5	0.0	0.3	0.1	0.5	5.6	0.7
Umariya	SD	0.2	0.2	0.0	0.3	0.3	0.3	0.3	0.3	0.5	0.0	0.2	0.0	0.5	4.4	0.5
Total	6-12	0.8	0.1	0.0	0.2	0.5	0.2	0.2	0.2	0.5	0.0	0.2	0.0	0.1	4.7	0.4
Total	13-24	0.9	0.2	0.0	0.4	0.6	0.3	0.4	0.3	0.8	0.0	0.2	0.0	0.1	7.0	0.5

All the values in the table is provided in kilograms where 1.0 denotes 100 gms

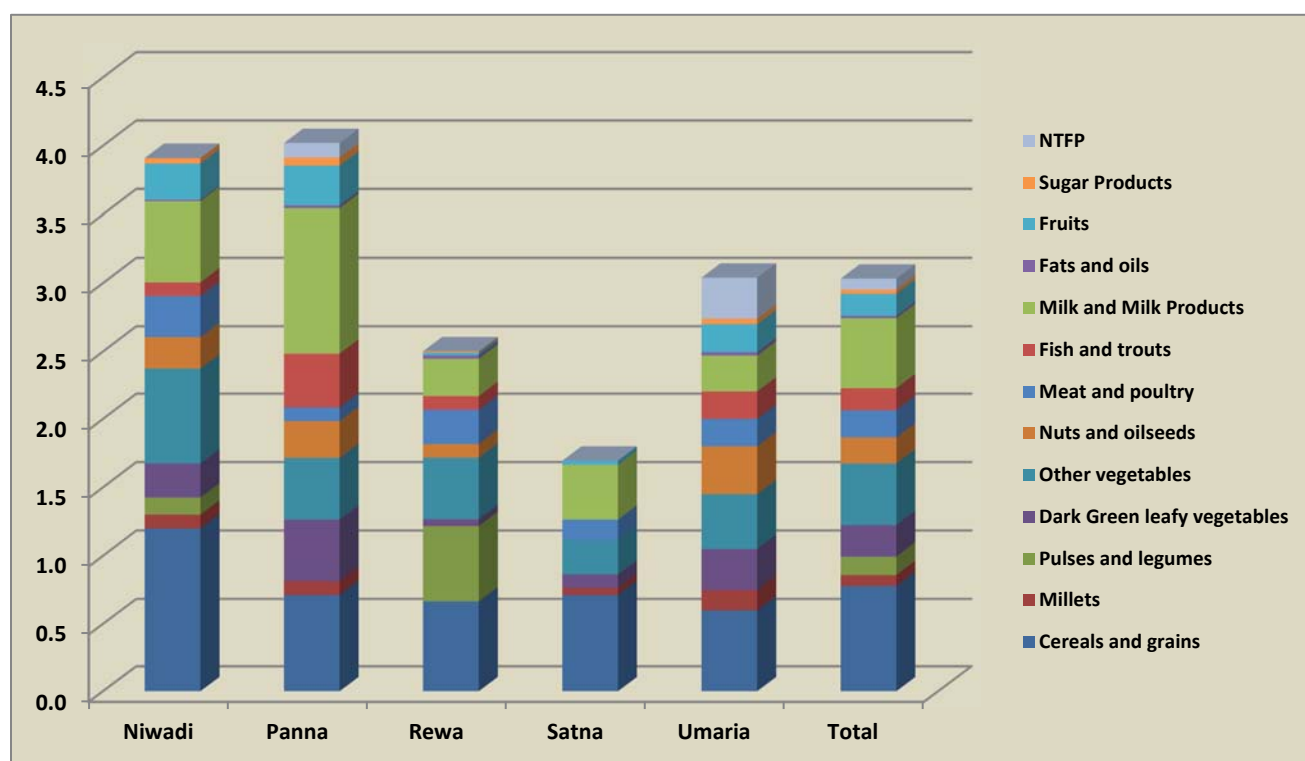


Figure 17.3: Food groups as consumed by Children/Infants

17.1.2.1. Cereals and grains

The total consumption of cereals and grains as observed accounts to 80 grams a day for 6-12 months and 90 grams per day for 13-24 months which is actually 20-30 grams more than the RDA for cereals. Annexure

Maximum cereals and grains consumption is recorded in Niwari about 120-150 gms and least is recorded for Umariya for about 60-70 gms per day.

The maximum portion of the diet however comes from cereals only. Cereals are mostly consumed in form of roti, dry or with sabzi if provided and rice about half to one tsp

17.1.2.2. Millets

Millets are consumed on an average of about 10-20 grams only for both the categories respectively. Umariya though is richest of all in having millets has shown higher intake in the children also for about 20-30 grams comparatively. The most common millets consumed in all the districts is Bajra and maize whereas in Umariya it is kodo, kutki, sanwa, and corns as well.

The children in Umariya tend to eat one corn a day on daily basis during the season.

17.1.2.3. Pulses and Legumes

The overall pulse consumption is fairly low amongst the children i.e. 10-20 grams for both the groups and is recorded in Niwari only in case of children.

The children start taking pulses once they start walking as reported by mothers; however this is found to be missing in analysis as the easiest way to feed the children is to make them hold a portion of chapatti while mothers are engaged in their work

17.1.2.4. Green Leafy Vegetables (GLV)

GLVs are however consumed by children during the winter and rainy seasons provided the availability of the food. On an average it is consumed by 20-40 gms a day. Highest is consumed in Panna, Niwari and Umariya for about 40-60 gms whereas Rewa and Satna has fairly low intake of about 20-30 grams per day

17.1.2.5. Other Vegetables

The other vegetables are consumed in fairly large amount for about 50-60 grams. The children from Niwari consume the highest for about 70-90 gms followed by children from Panna 50-70 grams then Rewa (50-60 gms); then Umariya (40-60 grams) and then Satna (30-40 gms)

17.1.2.6. Meat, poultry and fishes

Given the availability these products are consumed once in a week for about 30-40 grams per head. Fish consumption is recorded highest in Umariya, Panna whereas meat

consumption is recorded higher for Niwari and Rewa. All are consumed for about 30-40 grams per children for both age groups

17.1.2.7. Nuts and Oilseeds

On an average 20-40 grams are consumed in all the five districts wherein highest is consumed in Umariya for about 40-50 grams and lowest are consumed in Rewa for about 10-20 gms

17.1.2.8. Milk and Milk products

These are consumed relatively low, only 50-60 gms a day. In Panna children have better consumption of milk of about 100-125 gms compared to other districts where on an average they consume 70-80 grams hardly.

17.1.2.9. Fruits

The fruit consumption is again as low as 10-20 grams on an average. Highest are consumed in Niwari and Panna for about 30-40 grams for each category respectively. The women suggested that they manage somehow to provide at least a fruit a day to their children (sic – Niwari and Panna)

17.1.2.10. Others food group

NTFP are consumed in very low amount by children for about 20-30 grams especially in case of amla, bail, ber, mahua fruits. The highest are recorded for Umariya for about 30-50 grams and then Panna (10-20 gms). Zero consumption is recorded for other districts

17.1.2.11. Biscuits and Kurkura

The consumption of non-nutritious and zero calories food is fairly high amongst the villages of the studied area.

Biscuits

On an average a child consumes 7-8 biscuits a day provided from any local or popular brand including parle-g, Monaco, goodday, 50-50. This counts to about 40-45 grams a day. The highest consumption is recorded for Niwari for about 8-10 biscuits and lowest for Panna for about 3-5 biscuits a day, probably due to low income.

Kurkura

Similarly kurkura or other processed packets are consumed largely by the children on an average about 40-50 grams where 1 packet is 30 grams that means 1.5 packet a day.

These packets are consumed largely in Niwari for about 0-80 grams a day making it 2-3 packets per day followed by Rewa, Satna and Umariya where 30-40 grams a day is consumed on an average by basic by these children i.e. minimum one packet a day.

Panna has reported to have lowest consumption for about 15-20 grams only i.e. half a packet a day

Economy of Kurkura and Biscuits

On an average 1.5 packets are consumed in all the five districts and at least one packet having 5-6 biscuits are also eaten. The lowest price available in these villages is INR 5 per packet for both kurkura/biscuits

For kurkura – $5 \times 1.5 = 7.5$ INR a day and 225 INR for a month

For biscuits – $5 \times 1 =$ INR 5 per day and 150 INR per month

Total is $225 + 150 = 375$ INR per family per month.

Figure 17.4 clearly depicts the preference of zero calories food over the nutritious food. INR 375 can provide atleast 7 litres of milk i.e. 250 grams of milk a day can be replaced for these unhealthy products

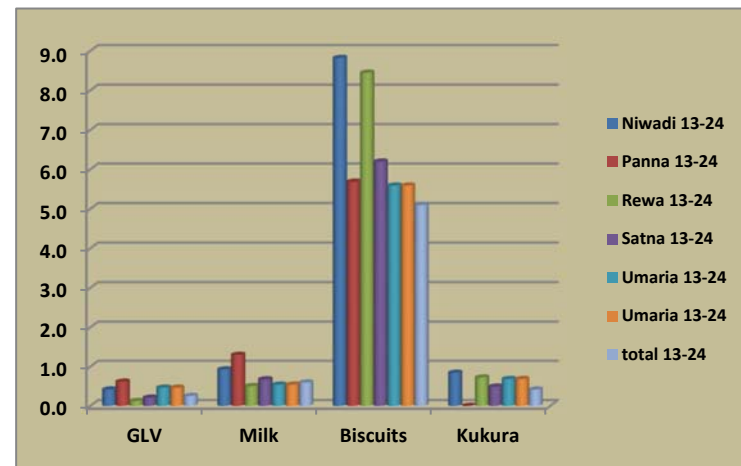


Figure 17.4: Comparison of Biscuit Kurkura with GLV and MMPs

17.2. Dietary Analysis of PLAs

Repetitive 24 hours dietary recalls are done thrice to ensure the authenticity of data for PLAs i.e. Pregnant, Lactating mothers and Adolescent (10 from each districts where $n = 150$ ($10 \times 3 \times 5$)).

Data is represented in Table 17.2

The data is presented for all the three categories for Pregnant, lactating mothers and adolescent girls. There is no special treatment for pregnant and lactating mother is observed. The same consumption period is recorded for adults as well. Analysis point-wise below

Table 17.4: Food intake depicted for PLAs

Districts	Pregnant 1 Lactating 2 Adolescent 3	Cereals and grains	Pulses and legumes	Fats and oils	GLV	Other vegetables	Roots and Tubers	Millers	Sugar Products	Fruits	Milk and Milk Products	Meat and poultry	Fish and trout	Pulses and legumes	Local available food
Niwadi	1	0.4	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.3
Panna	1	0.2	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.7
Rewa	1	0.3	0.0	0.0	0.1	0.0	0.1	0.0	0.0	0.0	0.0	0.2	0.0	0.0	0.4
Satna	1	0.4	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Umaria	1	0.5	0.1	0.0	0.1	0.1	0.0	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.1
Total		0.37	0.03	0.03	0.08	0.09	0.08	0.01	0.01	0.0	0.06	0.13	0.0	0.01	0.32
Niwadi	2	0.3	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.2
Panna	2	0.4	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.1
Rewa	2	0.3	0.0	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.0	0.0	0.0	0.1
Satna	2	0.4	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.2
Umaria	2	0.4	0.0	0.0	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.0	0.0	0.1
Total		0.3	0.03	0.04	0.07	0.08	0.08	0.02	0.01	0.0	0.08	0.09	0.0	0.01	0.14
Niwadi	3	0.3	0.01	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.1	0.1	0.0	0.0	0.5
Panna	3	0.3	0.02	0.1	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.4
Rewa	3	0.3	0.03	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.2	0.1	0.0	0.0	0.4
Satna	3	0.3	0.02	0.0	0.1	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.1
Umaria	3	0.4	0.04	0.0	0.1	0.1	0.0	0.0	0.0	0.0	0.0	0.1	0.0	0.0	0.1
Total		0.3	0.03	0.03	0.08	0.09	0.09	0.00	0.01	0.0	0.05	0.10	0.0	0.01	0.30

All the values are presented in grams where 1.0 is 100 grams for three categories viz. 1- Pregnant; 2 – Lactating and 3- Adolescent

17.2.1. Cereals and grains

17.2.1.1. Pregnant

The cereals and grains consumption is average out for pregnant women to 370 grams, wherein the highest trend is shown in Umaria with 500grams a day followed by Niwari and Satna with 400 grams a day. However the lowest were shown by Rewa and then Panna with 300-200 grams respectively

17.2.1.2. Lactating

Similar pattern is observed for lactating mothers, the average consumption of cereals by lactating mothers calculated as 370 grams, Highest are consumed in Umaria, Satna and Panna (400 gms) and whereas lactating mothers from Panna and Niwari consumes as low as 300 grams a day

17.2.1.3. Adolescent

The average consumption by adolescents from all districts is calculated as 300 grams which remained the same for all districts except for Umaria where, girls are consuming 100 grams extra on daily basis

17.2.2. Pulses and Legumes

17.2.2.1. Pregnant

The pulses consumption is considerably and drastically low. It averages out to be 30 grams a day for pregnant mothers. It is only consumed in Umaria on daily basis. In other districts it is consumed only once or twice a week.

17.2.2.2. Lactating

Consumption of pulses amongst the lactating mothers showed the similar trend. It is average out at 30 grams a day when consumed twice a week. It is eaten by fair amount in Umaria

17.2.2.3. Adolescent

Adolescent still have their share on pulses if school going as it is available in HCM in schools. The mean consumption is 40 grams. 30 grams in Umaria is consumed against 10-20 grams in other districts

17.2.2.4. Frequency of Pulse consumption

The frequency of pulse consumption is twice a week observed in all the districts provided other pulses if available from harvesting or cultivation.

The price of pulses per kilograms is too high for the community to bear for a week even. When prepared, the consistency is very thin washing out its nutrients to zero, if consumed.

A different trend is reported in Umaria, where, pulses are consumed 4-5 times in a week, wherein fact, the quality of

the pulses is comparatively poor due to its lower rates. The community from Amdi, Mardari and Bihuliya villages consume the pulses availed in the market for 30-40 rupees.

17.2.3. Green Leafy Vegetables

All the communities in all the regions have shown tremendous affinity towards GLV- any kind. The setback is its availability only during post monsoon and winter seasons.

During the season, this food remains on the favourite list with unlimited options provided from wild. (refer 15.4.2.2.)

17.2.3.1. Pregnant, Lactating and Adolescent

On average GLVs are consumed 80 grams per day per individual during the season. In districts separately, the consumption by almost all categories is similar i.e. 100 grams a day.

Howbeit the frequency of the preparation of GLV is not on daily basis. The family only consume GLVs thrice a week to the most, as collecting them altogether is a tough task because reaching out to nearby jungle could be a 8-10 kms walk.

The GLVs are mostly collected from jungles and farms, whereas those are purchased from market includes only maithy, palak and sarso to some extent.

17.2.4. Other vegetables

All the seasonal vegetables plus the locally available vegetables are consumed in large amount. Specially tomatoes, brinjal, okra and all gourds (karela, gilki, lauki, torai etc)

During winter paroda and Karelia become the talk of the town for the villagers. This vegetable is widely distributed and are consumed commodiously

17.2.4.1. Pregnant, Lactating and Adolescents

The same consumption trend is observed in all the categories where the average consumption of other vegetables is calculated as 90 grams whereas in all other districts the women and girls consume it atleast 100 grams a day

17.2.5. Roots and Tubers

Refer 15.4.2.3. for the detailed list of roots and tubers consumed during seasons and off seasons. The favourite is potato though. It is poor man's yam because it is used in copiously with almost all the vegetables. The consumption of the Household on monthly basis for this tuber is also high.

On weekly basis it is consumed as much s 10-15 kgs provided the size of the family

17.2.5.1. Pregnant, Lactating and Adolescent

Due to low price and easy availability the food is consumed by all the categories as much as 90 grams on an average. Amongst all the districts it is consumed upto 100 grams per individual per day

Apart from potato, other roots and tubers derive from the forest are consumed once a week or twice-thrice a month.

The quantity of other tubers have dropped down than earlier days as reported by elderly villagers

17.2.6. Milk and milk products

Consuming milk on a daily basis is a distant dream for community people due to lack of availability and high price.

17.2.6.1. Pregnant, Lactating and Adolescent

The average consumption of milk and milk products is calculated as 60grams, 80 grams and 50 grams for pregnant, lactating and adolescent girls respectively. Usually the milk is not consumed by individuals but due to special physiological conditions, community tend to manage providing milk to the locating and pregnant women somehow, if affordable. The fashion is recorded same throughout, wherein it is consumed only by community of Panna Niwari and Rewa. In Panna amongst the adolescent it is consumed by Yadav community only. Same is the case that is reported from Niwari that only OBC groups can consume milk, mostly in forms of tea. In tribal community 90% of the cases consume black tea or gud tea with no milk in it.

17.2.7. Sugar Products and Fruit

Sugar products and fruits are those products which are consumed once in a blue moon sort. The sugars are consumed by community on festivities and fruits are consumed if someone is ill or have special cases like pregnancy and lactation or small children.

17.2.7.1. Pregnant and Lactating

In some cases, pregnant and lactating mother have been consuming fruits. The average is calculated out 20 gram per day where the maximum cases belong to either Niwari or Panna.

17.2.7.2. Adolescent

In adolescents it is even lower to 10grams a day which is almost negligible. 75% of the adolescent have report to not have consuming fruits since past a year as could not afford them

17.2.8. Fish, meat and poultry

The OBC community participated in the study do not consume non-vegetarian sources except for 15% cases.

Ninety-nine percent of the tribes have however confirmed their liking towards this food group.

Grievously irrespective of their likings, they are not able to afford meat in large chunks, as their pocket doesn't permit them for this.

It is however consumed once in a month atleast. Eggs are consumed in fairly large quantity than chicken, goats or poultry.

Goats are consumed mainly during dussehra and holi. The community assembling is still a tradition where goat is cut in presence of the community and the meat is distributed as per the share.

In water-resource rich areas like Rewa, Niwari and Umaria, fish consumption is seen ratherish high

17.2.8.1. Pregnant

The average consumption of meat is interpreted as 130 grams and those of fish as 20 grams a day. Amongst the districts it is consumed mostly in Umaria. Eggs are consumed as much as 5-7 per person per month

17.2.8.2. Lactating

For lactating, the average of egg is calculated as 9 per month whereas chicken is consumed once in a month making an average of 200 grams once in a month

17.2.8.3. Adolescent

For adolescent the average of egg consumption is computed as 10 per head per month. Chicken consumption is computed as 200 grams and fish as 100 grams once in a months

17.2.9. Locally available food

As the figure depicts that the, after cereals and grains, the maximum food stuffs those are consumed by all the categories are Locally available food. This includes the tradition roots and tubers, fruits, vegetables and GLVs

This is however consumed mostly by pregnant women (324.67 grams on an average) at a time followed by adolescent (298.67) and least by lactating women (142.67)

17.2.10. Oil and nut seeds

The oil consumption is reported to have been very low in all the five districts. The household only requires 4-5 kilograms of oil in a month which sometimes last for fifteen days. This averages this out to only 166 grams per HH per day and 34.01 grams per person per day.

There is no special case reported for extra oil consumption or ghee consumption.

The OBC community somehow consumes ghee in their diet, but it is shockingly observed that the ghee consumption is confined to male members or children.

18. Chapter Eighteen– Nutrient Analysis

Based on the diet consumed, the average daily nutrient intakes are calculated using IFCTs by ICMR and is presented through this chapter

18.1. The detailed nutrient analysis of the foods Nutrient Analysis of Children (06-24 months)

those are consumed by Group 1 or G1 (Infant 6-12 months) and Group 2 or G2 (Children 13-24 months) based on raw

Children from Niwari from G2 is 191 gms against 153 grams for G1 and lowest is recorded 82.1 in Satna for G1

In Umaria it is recorded as 147 and 100 gms; Rewa 159 and 118; Panna 123 and 118 for G2 and G1 respectively.

18.1.3. Protein

The mean protein consumption is recorded as 19 and 18 gms for both groups which is lower than the protein consumed by children in Niwari (29.3 and 22.9 gms for G2 and G1). The lowest protein is consumed by G1 from Satna i.e. 11.6 grams and 15.5 for both the groups respectively.

Table 18.1: Nutrient Intake of Food derived from IFCT

District	Niwadi	Niwadi	Panna	Panna	Rewa	Rewa	Satna	Satna	Umari	Umari	Total	Total
Age	6-12	13-24	6-12	13-24	6-12	13-24	6-12	13-24	6-12	13-24	6-12	13-24
Energy (kcal)	1517.0	1922.2	896.9	1242.6	1213.0	1634.1	820.4	1204.3	858.2	1266.9	1231.7	1142.1
Carbohydrate (gm)	153.1	190.9	89.8	123.2	118.0	159.0	82.1	119.6	100.3	147.0	124.9	116.2
Protein (gm)	22.9	29.3	17.3	20.3	17.3	22.2	11.6	15.5	17.1	24.7	19.1	18.5
Total Fat (gm)	89.0	114.4	52.2	74.6	74.0	100.6	49.0	73.3	50.0	75.6	75.0	67.9
Calcium (mg)	211.8	263.9	172.7	215.0	103.5	131.9	100.4	127.6	133.9	176.1	151.0	154.9
Phosphorus (P) (mg)	171.3	221.9	153.2	200.6	95.3	124.3	79.8	101.2	128.4	182.5	142.0	135.7
Iron (Fe) (mg)	2.1	2.8	2.2	3.0	1.3	1.6	0.9	1.2	2.1	3.1	2.1	1.9
Vitamin B12 (mcg)	0.7	1.0	0.4	0.5	0.5	0.7	0.4	0.5	0.4	0.6	0.6	0.5
Total Fiber (gm)	3.4	4.6	3.9	5.3	1.3	1.7	1.3	1.9	4.9	7.4	3.7	3.2
Soluble Fiber (gm)	1.4	2.0	1.5	2.0	0.6	0.8	0.5	0.8	1.2	1.7	1.3	1.2
Insoluble Fiber (gm)	3.6	4.9	3.9	5.3	1.8	2.2	1.5	2.1	3.2	4.6	3.4	3.0
Omega - 3 Fats (mg)	157.0	222.5	182.8	258.9	64.6	86.4	68.4	94.5	140.3	207.7	155.7	135.7
Sodium (Na) (mg)	2078.6	2658.1	1167.1	1744.9	1738.0	2394.3	1170.5	1809.6	1159.6	1783.5	1778.2	1578.7
Potassium (K) (mg)	503.5	642.1	468.7	606.7	277.1	347.3	223.6	301.8	366.7	506.9	408.0	395.7
Zinc (Zn) (mg)	0.7	0.9	0.6	0.7	0.5	0.6	0.4	0.5	0.5	0.7	0.6	0.6
Vitamin C (mg)	8.2	11.0	8.3	11.1	3.7	4.8	3.3	4.8	6.5	9.0	7.0	6.5
Vitamin A (mcg)	166.3	256.8	202.9	313.9	63.9	98.0	77.3	116.6	167.5	257.6	193.4	153.7

food nutritive values are provided in Table 18.1

About 17 grams of protein is consumed by G1 in all districts

18.1.1. Energy/Calories intake

The mean calories or energy consumption for 6-12 months and 13-24 months children is computed as 1231.7 and 1142 respectively.

The highest intake is recorded in Rewa for both the groups as stated in earlier chapter regarding the cereal intake is higher in Rewa. The main source of energy for children comes from cereals only.

The lowest energy intake is reported for Satna about 820 KCal for group 6-12 months

18.1.2. Carbohydrate

The main source of carbohydrates in the community is cereal only and the mean carbohydrates intake is recorded as 125 and 116 gms per day for both groups. The mean carbohydrate consumption for G1 is computed more than G2

18.1.4. Fat

The fat consumption is considerably higher amongst these groups the average fat intake is calculated 75 and 68 grams per day by children of both groups respectively.

The highest fats are consumed by Niwari G2 children of about 114.4 grams against the lowest 52.2 grams reported for G1 from Panna

18.1.5. Minerals

18.1.6. Calcium

Only 154.9 mg and 151.0 mg of calcium is consumed by G2 and G1 respectively on average. The highest intake is recorded in Niwari 264 which is probably due to consumption of milk as observed during study.

The lowest intake is recorded as 100 from group 1 in Satna

18.1.7. Iron

The average iron intake is computed as 2.1 and 1.9 for both groups. The intake in group 1 is slightly higher than group 2.

A comparatively more of about 3 mg of iron are consumed by G2 of Umari. Niwadi and Panna.

18.1.8. Sodium

Fishes and GLVs are great sources of sodium and are consumed higher in Umari, Niwari and Rewa, so is reflecting in the intake of sodium of the respective population.

The average sodium consumption is interpreted as 1779 and 1579 respectively for both groups.

Highest values are 2658 and 2394 for Niwadi and Satna respectively.

18.1.9. Other minerals

The mean for zinc intake computed as 0.6 mg; and that of potassium is 408 and 395 mg for both groups.

Zinc and potassium comes from animal origin more thus it is reflected though food intake also. The regions where meat consumption by children are higher have higher amount of minerals in their food. For instance in Umari and Niwadi the intake of zinc and potassium is calculated as 0.7 and 0.5. 503 and 507 respectively for G1 and G2

18.1.10. Vitamins

18.1.11. Vitamin A

The average intake is recorded as 193 and 153 mcg for g1 and g2. Intake of vitamin A is moderately higher than children of 12-24 months probably due to intake of breast milk. Highest is recorded for Panna and lowest for Rewa

18.1.12. Vitamin C

The average intake of Vitamin C is recorded as 7.5 and 6.5 mcg for both groups, wherein the highest recorded value is 11 from Niwadi and Satna. Shockingly the lowest Vitamin C intake is reported from Satna and Rewa

18.1.13. Vitamin B complex

As vitamin b compex rich food is found missing in the diet of the community belongs to these districts, apart from animal origin foods and GLVs. Formers are consumed in lesser amount whereas latter one are seasonal consumption only.

This has a huge impact on the overall nutrient intakes. Thus the Bcompex are recorded as 0.7 mcg and 0.6 mcg on average. The highest intake is recorded as 1.0 and lowest as 0.5 for Niwadi, Panna and Umari respectively.

18.1.14. Comparison between two groups

As shown in table 18.1, the nutrient intake is compared between G1 (6-12 months) and G2 (13-24 months), the intake of all nutrients is correlatively greater in G1 .

This implicate the presence of breastmilk in the diet of 6-12

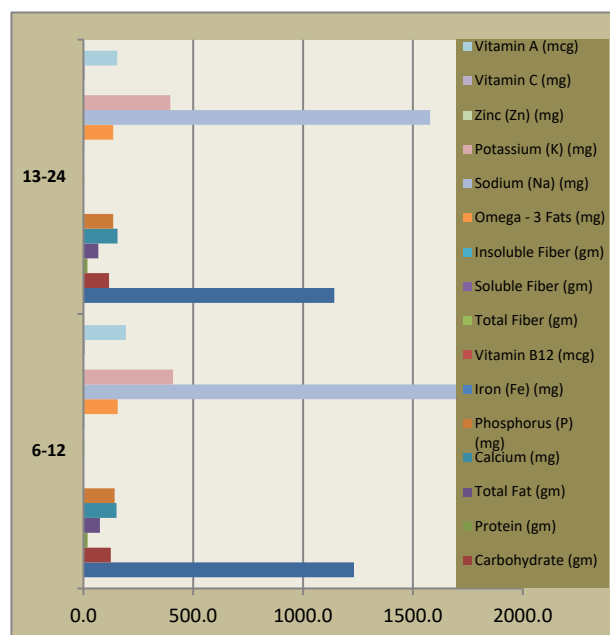


Figure 18.1: Comparison of Nutrient intake between G1 and G2 months

18.2. Nutrient Analysis of PLAs

Nutrient analysis of PLAs is presented through Table and figure 18.2

18.2.1. Energy/Calories intake

The mean calories or energy intake is computed to be 1216 against 1089 and 1079 for Pregnant, Lactating and Adolescents respectively.

18.2.1.1. Pregnant

The highest energy intake for Pregnant mothers is recorded as 1866 from Niwadi and lowest is recorded for Umari as 650.7

18.2.1.2. Lactating

Similarly, the highest calories is recorded as 1816 kcal for Niwadi followed by 1414 for lactating in Satna ten 1288 in Panna. The lowest is recorded for Umari and Rewa, around 600 kcal.

18.2.1.3. Adolescent

The highest calories are consumed in Panna of about 1480 kcal where as lowest is consumed in Umari and Satna about 770 Kcal and 905 Kcal.

Table 18.2 : Nutrient Intake PLAs

Districts	All 5 district s	All 5 district s	All 5 districts	Niwadi	Niwadi	Niwadi	Panna	Panna	Panna	Rewa	Rewa	Rewa	Satna	Satna	Satna	Umaria	Umaria	Umaria
Pregnant 1 Lactating 2 Adolescent 3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Energy (kcal)	1216.7	1089.2	1079.6	1866.8	1251.7	1147.7	1288.8	1188.8	1480.9	1105.2	970.0	1093.4	1171.7	1414.1	905.7	650.7	621.4	770.0
Carbohydrate (gm)	181.3	165.7	159.9	278.1	190.0	173.5	191.6	173.4	217.3	160.0	144.8	156.6	177.7	218.7	135.6	99.0	101.8	116.4
Protein (gm)	22.1	19.5	18.9	34.4	23.4	19.4	24.3	21.3	26.4	20.5	17.2	19.8	20.0	24.1	16.3	11.4	11.4	12.5
Total Fat (gm)	36.4	30.5	32.2	59.9	35.5	31.3	37.9	37.4	46.7	34.2	27.9	35.4	32.3	37.0	25.2	17.8	14.6	22.6
Calcium (mg)	177.5	143.9	159.6	265.4	200.9	139.8	221.6	195.6	256.5	191.6	126.7	220.5	107.8	107.0	87.6	101.1	89.4	93.2
Phosphorus (P) (mg)	449.0	397.6	377.6	686.0	460.8	431.4	474.4	413.4	473.0	411.9	363.1	398.7	428.8	534.2	343.3	243.9	216.4	241.7
Iron (Fe) (mg)	5.0	3.7	4.2	8.0	4.1	4.6	5.3	3.9	4.7	4.2	3.7	4.0	4.6	5.0	4.0	2.8	1.8	3.6
Vitamin B12 (mcg)	0.1	0.1	0.1	0.1	0.2	0.0	0.2	0.2	0.2	0.1	0.1	0.2	0.0	0.0	0.0	0.1	0.1	0.0
Total Fiber (gm)	20.6	16.9	16.9	32.9	18.5	22.5	19.9	17.0	17.1	17.5	15.6	15.9	20.3	24.4	17.0	12.3	9.2	12.0
Soluble Fiber (gm)	4.6	3.9	4.1	6.8	4.0	5.3	4.3	4.0	4.1	4.0	3.8	4.0	4.9	5.5	3.9	2.9	2.0	3.3
Insoluble Fiber (gm)	26.4	23.5	23.2	38.1	25.5	28.8	27.1	23.1	24.7	24.2	22.2	22.1	27.6	34.9	23.2	15.2	11.9	17.5
Omega - 3 Fats (mg)	295.0	181.2	204.6	692.7	200.1	328.9	215.8	207.6	205.3	186.8	173.8	205.2	263.7	227.4	153.9	116.0	97.0	129.9
Sodium (Na) (mg)	733.6	523.6	864.2	903.8	463.8	591.7	922.1	928.8	1156.8	633.7	491.9	882.2	750.7	561.3	996.5	457.4	172.0	693.9
Potassium (K) (mg)	1399.7	1101.9	1151.4	2451.1	1189.7	1152.8	1244.1	1219.3	1307.3	1259.0	1128.1	1305.4	1302.9	1424.8	1047.8	741.6	547.8	943.9
Zinc (Zn) (mg)	2.9	2.6	2.5	4.2	2.9	3.1	3.0	2.6	2.9	2.6	2.4	2.4	3.0	3.8	2.4	1.6	1.4	1.6
Vitamin C (mg)	12.3	9.3	14.2	17.7	9.7	13.1	12.5	10.4	12.2	11.8	11.1	14.3	11.2	11.6	13.6	8.3	3.8	17.7
Vitamin A (mcg)	126.4	66.3	118.1	341.9	78.4	301.5	61.6	62.2	94.2	83.7	78.0	78.5	105.4	86.2	47.4	39.1	26.8	68.8

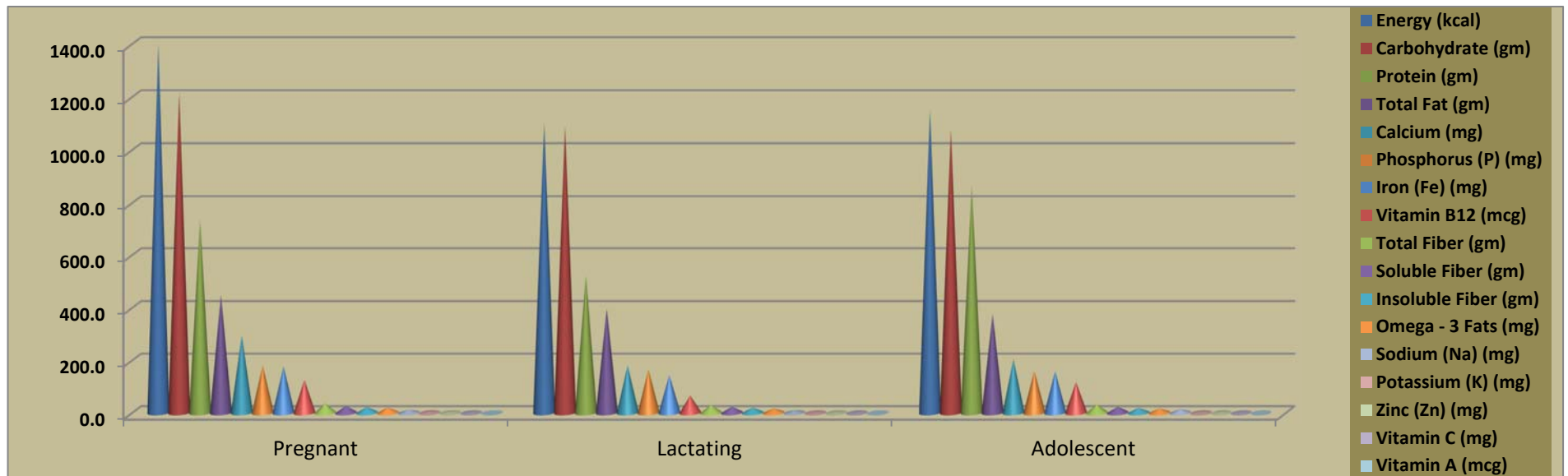


Figure 18.2 : Comparison of means of Nutrients between PLAs

18.2.2. Carbohydrate

18.2.2.1. Pregnant and Lactating Mothers

The highest carbs intake are reported in Niwadi with 278.1 grams and lowest are reported in Rewa and Umariya of about 160 and 99 grams respectively.

The mean is however 181 kcal of energies consumed sparingly by Pregnant women

Lactating women of Satna is consuming 218.7 carbs against 190 and 173 for Niwadi and Panna. The mean carbs intake is computed as 166 where as Rewa with 145 gms and Umariya 101 grams reported the least consumption

18.2.2.2. Adolescent

Adolescent girls from Satna are reported to have been taking highest of carbs intake with 217 grams that is 130 grams more than the mean carb intake which is computed as 160. This value holds true for Niwadi and Rewa also.

Where as girls belong to Umariya have only 116 grams of carbohydrate a day

18.2.3. Protein

18.2.3.1. Pregnant, Lactating and Adolescent

Amongst lactating mothers the highest protein is taken by lactating mothers of Satna (24) then Niwadi (23) and Panna (21) whereas lowest are consumed in Rewa (17) and Umariya (11)

Similar pattern is recorded for Pregnant mothers where the mean is computed as 22, the lowest is 11.4 grams and highest is 34 grams from Niwadi

18.2.3.2. Adolescent

The mean protein intake of adolescent girls is computed as 19 grams which is 7 grams lesser than Panna (26 grams) and 3 grams more than Satna (16) and 6 grams more than Umariya (13) The lowest protein is taken by girls of Umariya.

18.2.4. Fat

18.2.4.1. Pregnant

The mean fat intake is computed as 36.4 grams which is 23 grams lower than the highest recorded for Niwari (60) then Panna (38). The mean is higher from Satna (32) and Rewa (34) The lowest fat is consumed by women of Umariya (18 grams) in this group

18.2.4.2. Lactating and Adolescent

The mean fat intake is computed as 31-32 for Lactating and adolescent girls, wherein the highest intake is recorded for

Panna where Adolescent girls are taking 46.7 grams of fat per day against 37.4 grams by Lactating mothers.

The lowest is recorded for Umariya where adolescent girls are consuming 22.6 gram and 14.6 grams by Lactating mothers

18.2.5. Minerals

18.2.6. Calcium

Pregnant

The mean calcium is 178 mg higher to 108 and 107 for Satna and Umariya. Highest is recorded for as 265, 222 and 192 for Niwadi, Panna and Rewa

Lactating and Adolescent

The mean calcium is recorded as 160 mg for adolescent and 144 for lactating mothers. The highest intake is recorded in Panna for calcium i.e. 257 for Lactating and 201 for adolescent in Niwadi.

Girls and mothers from Umariya are consuming only 242 and 217 mg of calcium per day

18.2.7. Iron

18.2.7.1. Pregnant

Highest in the group is consumed by Pregnant women of Niwari i.e. 8 mg against 2.8 mg in Umariya. The mean iron intake is computed as 5

18.2.7.2. Lactating and Adolescent

The mean iron intake is recorded as 4.2 for adolescent girls and 3.7 for lactating mothers. Highest is however consumed in Satna and Umariya remains at the lowest position in providing iron in the food i.e. 3.6 mg for adolescent and 1.8 mg for Lactating

18.2.8. Sodium and Potassium

18.2.8.1. Pregnant

The mean sodium and potassium for pregnant women is calculated as 734 and 1400 mg respectively. Again the highest consumption is recorded for Niwari and Lowest for Umariya wherein sodium values are computed as 903 and 457 mg and for Potassium is 2451 and 741 as highest and lowest respectively

18.2.8.2. Lactating and Adolescent

The mean sodium and potassium for lactating and adolescent girls are computed as 864 and 1151 for adolescent girls and 524 and 1102 mg for lactating mothers.

The highest sodium and potassium intake is recorded in Panna 1157 mg and 1307 mg respectively for adolescent and 1156 and 1307 in for adolescent girls

18.2.9. Vitamins

18.2.10. Vitamin A

18.2.10.1. Pregnant, Lactating and Adolescent

The mean of Vitamin A intake is recorded as 126 for pregnant, 118 for Adolescent and only 66 for Adolescents. The highest Vitamin A intake is reported by Pregnant and Adolescent girls of Niwari by 342 and 302 mcg respectively and the lowest is reported by Pregnant and Lactating mothers of Umaria by 39 and 27 mcg respectively.

The girls from Satna is consuming only 47 mcg of Vitamin A, which is lowest amongst the adolescent girls

18.2.11. Vitamin C

18.2.11.1. Pregnant, Lactating and Adolescent

The mean value of Vitamin C is reported to 14 mg for adolescent, 12 for pregnant and only 9 for lactating. Highest vitamin c intake is observed in Umaria where 18 mg of iron is consumes by adolescent girls. Interestingly Umaria has the lowest consumption of vitamin c for both pregnant and lactating mothers by 8 and 4 mcg respectively

18.2.12. Vitamin B complex

18.2.12.1. Pregnant, Lactating and Adolescent

Shockingly Vitamin B complex turned out to be negligible for this group. The mean is recorded as 0.1 mcg for all categories and highest is recorded as 0.2 for all categories in Niwari, Rewa and Panna

18.2.13. Comparative Analysis

18.2.13.1. Between Categories

Figure 18.2 shows the comparative graph between the categories – Pregnant, Lactating and Adolescents. It is depicted from the graph that Pregnant women from all the districts have better nutrient intake for all nutrients analyzed against Lactating mothers, who come second in the grade analysis.

The condition is poor with adolescent girls who stand last on the comparison board. It is reported that all the nutrient intake of adolescent girls are poor and lowest of all the three categories.

18.2.13.2. Between Districts

The mean of all the categories are derived and a graph is computed to show the comparison of nutrient intake between districts. As depicted from figure 18.3, Niwari shows the highest intake of all nutrients compared to other districts for all the categories – PLAs

The lowest nutrients intakes are shown in Umaria for all the categories

The other districts – Panna, Rewa and Satna has average values (mean of highest and lowest) and has shown intake of all the nutrients almost same for all the categories

The chart further emphasise that the energy and carbohydrates are the highest nutrient intakes compared to

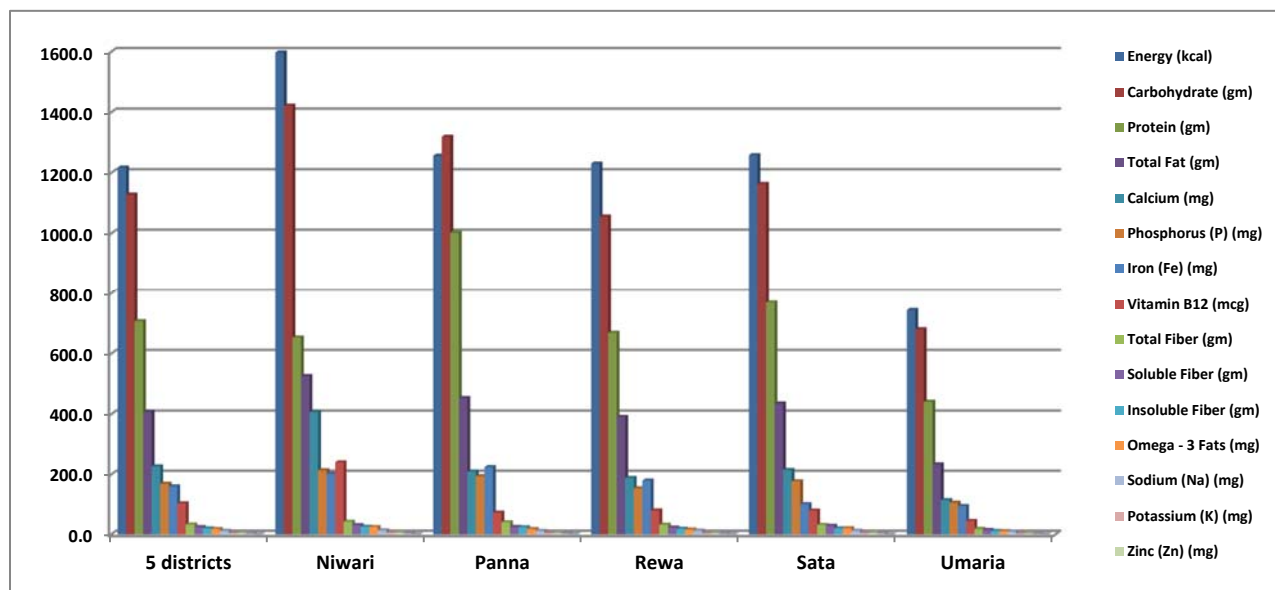


Figure 18.3 : Comparison between districts for PLA

Vitamins and Minerals. The energy needs are met majorly through cereals and fats. Apart from that there is no specific significance shown for other nutrients.

19. Chapter Nineteen – Comparison with Recommended Dietary Allowances (RDA)

There are certain recommended portions in grams of each food groups for each category individually and these values are set by National Institute of Nutrition as prescribed by Indian Council of Medical Research. These are required to follow the balanced diet in order to avoid any nutritional deficiency or excess intake.

Likewise, the recommended nutrients intake are advised by ICMR to be followed to sustain a normal healthy lifestyle and to avoid any micronutrient –deficiencies. The clinical co-relation with these values determine the levels of the nutrients taken by any individual and further helps to analyse the Nutritional Status of the respective being.

These values are provided in portions only, thus a proper calculation is applied for different age-group to be converted the recommended allowances of food groups into grams (for easy understanding), which is further analyzed with the consumed dietary and nutrient intake as already discussed in chapter 17 and 18 respectively.

Based on these calculation comparison is made and difference of the values between recommended and consumption is calculated and explained through graphs in this chapter

19.1. Comparison of Recommended against consumed diet portions for Infants

19.1.1. Infants 6-12 months

The recommended and consumed portions of each food group are demonstrated in table and figure 19.1.

As shown in the table and figure except for calories, reverse and negative pattern is observed for almost all the nutrients that means all the nutrients are consumed lesser than required. This is crosscheck point for origin of malnutrition.

The pattern is similar in all the districts where cereal consumption is more than the recommended on but the diet of the infants lag behind of all the required food groups thus making child more prone towards infection.

The cereal consumption is 478% higher than the recommended against pulses which are 67% lower than the recommended, milk and milk products is down by 74 % roots and tubers by 62 fruits by 70 and sugar by 80%

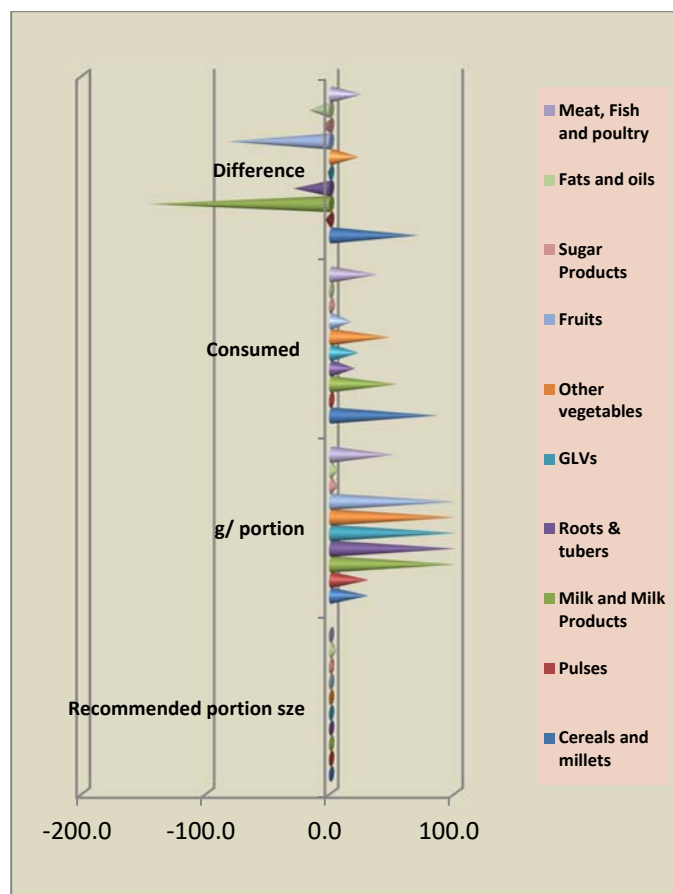


Figure 19.1 : Comparison between recommended and consumed

This is also a check point for failed complimentary feeding where child is not provided with all the necessary food groups, leading it to poor foundation and may result in consecutive health problems due to poor or lesser intake of protective food amongst the diet.

Amongst the district highest difference is recorded for Niwadi and lowest is recorded for Umaria for cereal, that have a positive difference (i.e. the consumption is more than the recommendation)

The negative differences are recorded for other food groups including pulses, roots and tubers, fruits, milk and milk products etc. These differences range from -12% to -92%

The highest negative difference is recorded for Milk products in Rewa i.e. -74% and lowest is recorded in GLVs for about -2%

Table 19.1 : Comparison between Recommended and Consumed for 6-12 months

Food Groups	g/ portion	Recommended portion size	Recommended Quantity grams	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference
				Niwadi		Panna		Rewa		Satna		Umaria		5 districts	
Cereals and millets	30.0	0.5	15.0	130.0	115.0	82.5	67.5	66.7	51.7	71.4	56.4	75.0	60.0	85.1	70.1
Pulses	30.0	0.3	7.5	12.5	5.0	0.0	-7.5	0.0	-7.5	0.0	-7.5	0.0	-7.5	2.5	-5.0
Milk and Milk Products	100.0	2.0	200.0	59.0	-141.0	104.4	-95.6	28.0	-172.0	45.0	-155.0	27.0	-173.0	52.7	-147.3
Roots & tubers	100.0	0.5	50.0	23.0	-27.0	24.4	-25.6	10.0	-40.0	3.6	-46.4	35.0	-15.0	19.2	-30.8
GLVs	100.0	0.3	25.0	25.0	0.0	38.9	13.9	5.0	-20.0	11.6	-13.4	30.0	5.0	22.1	-2.9
Other vegetables	100.0	0.3	25.0	70.0	45.0	50.0	25.0	45.0	20.0	30.5	5.5	40.0	15.0	47.1	22.1
Fruits	100.0	1.0	100.0	26.5	-73.5	28.3	-71.7	2.0	-98.0	3.7	-96.3	20.5	-79.5	16.2	-83.8
Sugar Products	5.0	2.0	10.0	4.0	-6.0	5.6	-4.4	1.0	-9.0	0.5	-9.5	4.0	-6.0	3.0	-7.0
Fats and oils	5.0	4.0	20.0	1.0	-19.0	1.7	-18.3	2.5	-17.5	0.6	-19.4	2.5	-17.5	1.6	-18.4
Meat, Fish and poultry	50.0	0.3	12.5	40.0	27.5	44.4	31.9	35.0	22.5	25.0	12.5	40.0	27.5	36.9	24.4

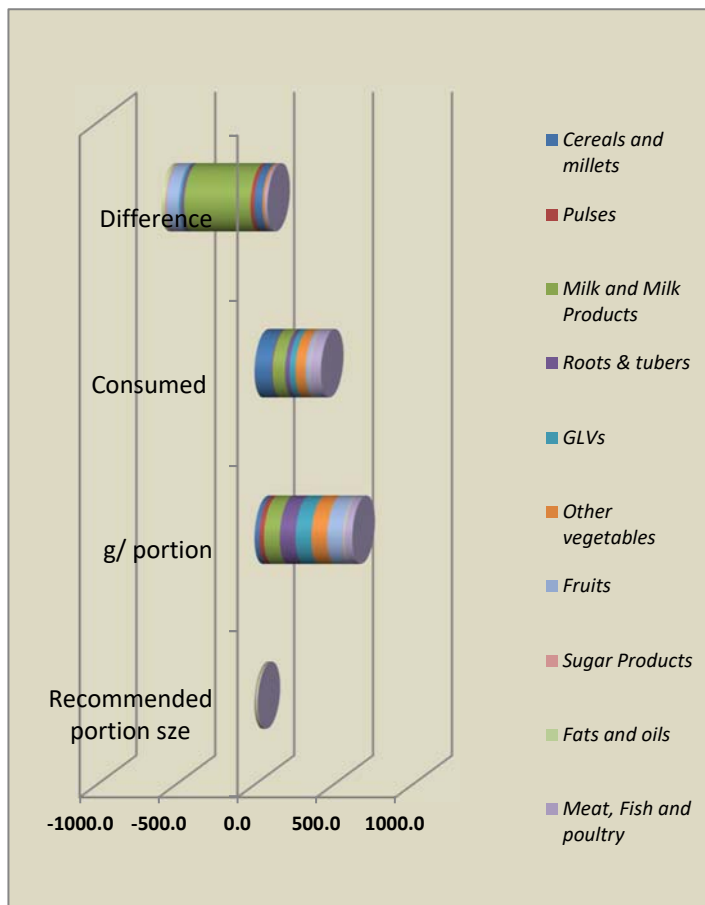
Table 19.2 : Comparison between Recommended and Consumed for 13-24 months

Food Groups	g/ portion	Recommended portion size	Recommended Quantity grams	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference
				Niwadi		Panna		Rewa		Satna		Umaria		5 districts	
Cereals and millets	30.0	2.0	60.0	172.8	112.8	110.6	50.6	78.5	18.5	92.0	32.0	96.5	36.5	110.1	50.1
Pulses	30.0	1.0	30.0	23.3	-6.7	0.0	-30.0	0.0	-30.0	0.0	-30.0	0.0	-30.0	4.7	-25.3
Milk and Milk Products	100.0	5.0	500.0	93.1	-406.9	130.2	-369.8	50.4	-449.6	67.5	-432.5	54.2	-445.8	79.1	-420.9
Roots & tubers	100.0	0.5	50.0	31.0	-19.0	34.7	-15.3	20.0	-30.0	7.5	-42.5	51.0	1.0	28.8	-21.2
GLVs	100.0	0.5	50.0	41.8	-8.2	61.8	11.8	12.5	-37.5	21.0	-29.0	46.6	-3.4	36.7	-13.3
Other vegetables	100.0	0.5	50.0	90.0	40.0	70.4	20.4	58.5	8.5	49.8	-0.2	55.0	5.0	64.7	14.7
Fruits	100.0	1.0	100.0	39.6	-60.4	34.0	-66.0	5.0	-95.0	8.0	-92.0	28.3	-71.7	23.0	-77.0
Sugar Products	5.0	3.0	15.0	6.4	-8.6	8.0	-7.0	2.5	-12.5	1.0	-14.0	6.4	-8.6	4.9	-10.1
Fats and oils	5.0	5.0	25.0	2.0	-23.0	2.8	-22.2	3.8	-21.3	1.2	-23.8	3.8	-21.3	2.7	-22.3
Meat, Fish, Poultry	50.0	1.0	50.0	72.9	22.9	76.8	26.8	65.2	15.2	44.8	-5.2	73.2	23.2	66.6	16.6

19.1.2. Children 13-24 months

The values are displayed Table and figure 19.2. As shown through figure.

Figure 19.2: Comparison between Recommended and Consumed for 12-24 months



Apart from cereals and millets and milk groups all the other food groups have shown negative difference in this category also. Both the groups have shown Have shown 83% and 16% of positive difference. The other groups are tremendously low in consumption range from -27% to -84%. The highest negative values are scored for pulses in all the districts where in all the case it is found negligible in consumption compared to the recommended one. The lowest negative values are recorded for other vegetables which are consumed -27% lower than the recommended allowance.

Amongst the districts, the highest negative value is recorded for milk and milk products in Niwari, Panna, Satna and Umari ranging from -400 grams to -500 grams.

This is again a check point for complimentary feeding practices which are clearly shown from the data are not upto the mark and children are dependent on cereals and pulses and other vegetables for their basic diet.

Dietary diversity is found missing and only energy dense food groups are consumed rather than protective and body building food groups, which is the basic attire at this age.

19.2. Comparison of Recommended and consumed Diet portions for PLAs

19.2.1. Adolescent girls (12-18 years)

As explained above, the mean of the values are taken out to provide the umbrella of diet portion for this age group. The data is illustrated through figure and table 19.3

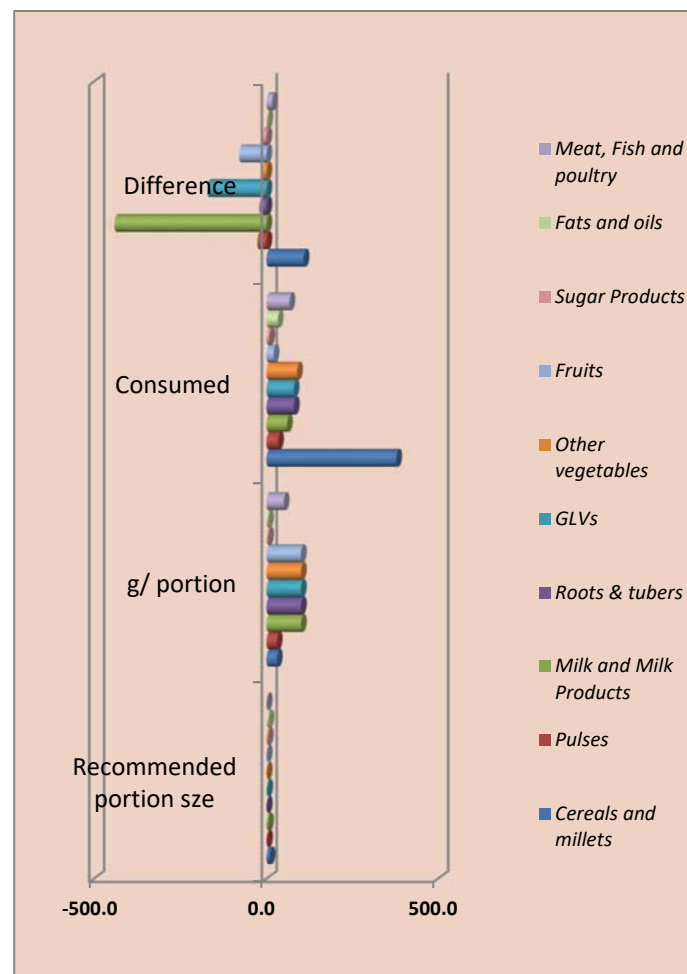


Figure 19.3 Difference between consumed and recommended for Adolescent

Similar trend is observed for the adolescent girls. The main sources of food plate are cereal, grains and roots and tubers, and fats and oil.

However none of the food items have shown positive differences. All are consumed in negative differences against the recommended ones.

Table 19.3 : Difference between consumed and recommended for Adolescent

Food Groups	g/ portion	Recommended portion size	Recommended Quantity grams	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference
				Niwadi		Panna		Rewa		Satna		Umariya		5 districts	
Cereals and millets	30.0	11.0	330.0	296.8	-33.2	340.3	10.3	278.2	-51.8	320.5	-9.5	358.6	28.6	318.9	-11.1
Pulses	30.0	2.3	67.5	22.9	-44.6	35.2	-32.3	26.3	-41.2	21.3	-46.2	29.0	-38.5	26.9	-40.6
Milk and Milk Products	100.0	5.0	500.0	56.8	-443.2	0.0	-500.0	158.2	-341.8	41.8	-458.2	3.8	-496.2	52.1	-447.9
Roots & tubers	100.0	1.5	150.0	81.5	-68.5	105.6	-44.4	130.8	-19.2	80.3	-69.7	31.4	-118.6	85.9	-64.1
GLVs	100.0	1.0	100.0	70.3	-29.7	84.4	-15.6	99.8	-0.2	74.9	-25.1	70.0	-30.0	79.9	-20.1
Other vegetables	100.0	2.0	200.0	97.8	-102.2	56.3	-143.7	96.3	-103.7	83.7	-116.3	111.6	-88.4	89.1	-110.9
Fruits	100.0	1.0	100.0	8.0	-92.0	3.5	-96.5	19.7	-80.3	16.9	-83.1	16.2	-83.8	12.9	-87.1
Sugar Products	5.0	5.0	25.0	7.0	-18.0	7.0	-18.0	7.3	-17.7	5.8	-19.2	11.0	-14.0	7.6	-17.4
Fats and oils	5.0	7.5	37.5	36.1	-1.4	28.1	-9.4	42.9	5.4	20.3	-17.2	25.3	-12.2	30.5	-7.0

Table 19.4 : Difference between consumed and recommended for Pregnant mothers

Food Groups	g/ portion	Recommended portion size	Recommended Quantity grams	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference	Consumed	Difference
				Niwadi		Panna		Rewa		Satna		Umariya		5 districts	
Cereals and millets	30.0	9.0	270.0	369.6	99.6	238.2	-31.8	337.8	67.8	417.8	147.8	524.7	254.7	377.6	107.6
Pulses	30.0	2.0	60.0	20.3	-39.7	32.4	-27.6	38.8	-21.3	24.7	-35.3	52.8	-7.2	33.8	-26.2
Milk and Milk Products	100.0	5.0	500.0	82.4	-417.6	159.3	-340.7	27.9	-472.1	9.9	-490.1	18.3	-481.7	59.5	-440.5
Roots & tubers	100.0	1.0	100.0	86.3	-13.7	91.0	-9.0	99.6	-0.4	75.6	-24.4	45.1	-54.9	79.5	-20.5
GLVs	100.0	2.5	250.0	70.2	-179.8	91.0	-159.0	57.1	-192.9	72.4	-177.6	102.7	-147.3	78.7	-171.3
Other vegetables	100.0	1.0	100.0	102.9	2.9	91.0	-9.0	49.2	-50.8	79.3	-20.7	121.3	21.3	88.8	-11.2
Fruits	100.0	1.0	100.0	28.1	-71.9	22.8	-77.2	17.1	-82.9	11.5	-88.5	24.4	-75.6	20.8	-79.2
Sugar Products	5.0	4.0	20.0	6.0	-14.0	0.0	-20.0	6.6	-13.4	7.7	-12.3	20.6	0.6	8.2	-11.8
Fats and oils	5.0	6.0	30.0	21.0	-9.0	45.5	15.5	29.9	-0.1	32.7	2.7	35.4	5.4	32.9	2.9

The cereals are consumed -3% i.e. 11 kcal down the recommended one. The highest negative difference is recorded for milk and milk products for about -90% and then by fruits for about -%. Even fats and oils which are consumable high comparatively to other food groups amongst the villagers, is moderately low in case of adolescents.

Fruits are mostly consumed when a child is sick at home. Within the districts the lowest negative value is recorded for GLVs in Rewa by -0.2% and in Panna by -15 gms of difference and Rewa by -15 grams. In the consumption of GLVs in the said districts are considerably higher than other districts amongst this group.

The highest difference is recorded for milk by -500grams to -450 grams in all the districts showing zero consumption of milk

19.2.2. Pregnant Mothers

The comparison and difference is shown through Table and figure 19.4. As clear from the table, the groups that are provided in bulk for the plate of pregnant mother are, roots and tubers, cereals and fats and oils

In roots and tubers the mostly consumed tuber is potato which is the only vegetable available to them because of the bulk it produces in the food.

As captured from the table and figure, the positive differences are shown by cereals, roots and tubers and fats and oils only. The difference as observed for cereals is 40%, roots and tubers by 80% and fats and oils by 10%. The negative differences are shown in all other food groups including GLVs by -69% and milk and milk products by -88% i.e. no protective foods are being consumed by pregnant women either. The pulses consumption is low by -44% than recommended allowances

Within the districts the negative difference is observed even in cereals in Panna where pregnant mothers are consuming 31.8 grams lower than the recommended portions.

The highest negative differences are recorded for milk that concludes zero intake. Roots and tubers are consumed in good amount in Rewa and have shown a negative difference of -0.4% only.

Observational checkpoint :

This is a site for checking the birth of new born from the studied cases which might be low-birth weight or poor in nutrition. The status of mothers need to be examined too.

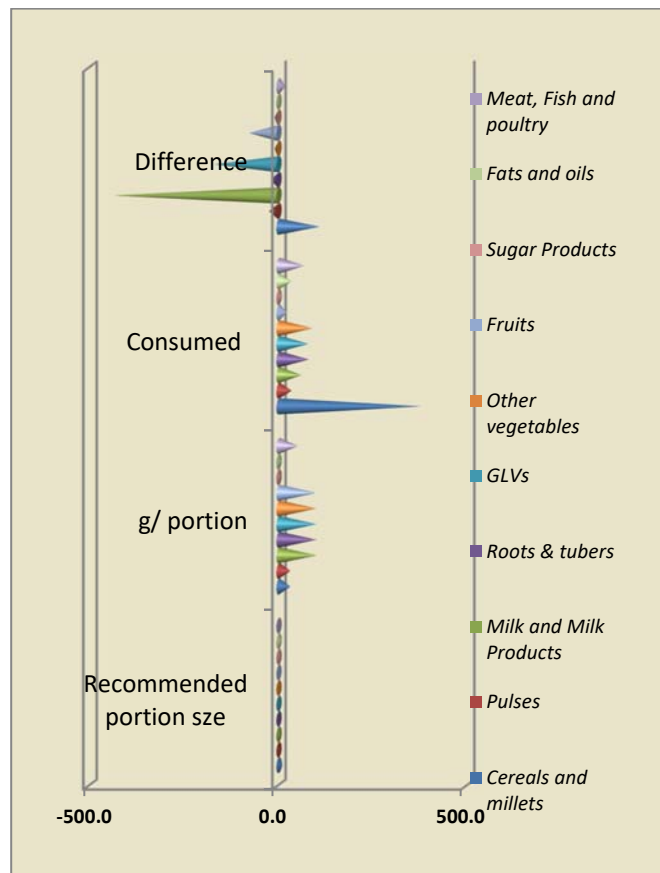


Figure 19.4 Difference between consumed and recommended for Pregnant mothers

19.2.3. Lactating Mothers

The data is presented in table and figure 19.5

Within lactating mothers, the positive difference is observed only in the cereals by 29% only. Rest of the food groups are consumed in negative differences as the case with other groups.

The maximum negative difference is observed for pulses which is consumed -72% lesser than the recommended allowance similarly fruits by -88% and GLV by -72%.

The highest negative difference is observed for Milk and Milk products which is consumed -350 grams to -400 grams lower than recommended allowance amongst the districts.

Panna has shown exception here and positive difference is observed for roots and tubers and other vegetables consumption by 27.2% and 8.0% respectively that depicts that these food groups are consumed comparatively in higher amounts and thus they contribute to the total calories intake

Table 19.5 : Difference between consumed and recommended for Lactating mothers

Food Groups	g/ portion	Recommen ded portion size	Recommen ded Quantity grams	Consum ed	Differen ce	Consum ed	Differen ce	Consum ed	Differen ce	Consum ed	Differen ce	Consum ed	Differen ce	Consum ed	Differen ce
				Niwadi		Panna		Rewa		Satna		Umaria		5 districts	
Cereals and millets	30.0	10.0	300.0	309.3	9.3	400.6	100.6	317.9	17.9	400.7	100.7	509.8	209.8	387.7	87.7
Pulses	30.0	4.0	120.0	18.4	-101.6	42.3	-77.7	41.1	-78.9	21.8	-98.2	44.6	-75.4	33.6	-86.4
Milk and Milk Products	100.0	5.0	500.0	90.3	-409.7	170.2	-329.8	98.2	-401.8	14.3	-485.7	22.1	-477.9	79.0	-421.0
Roots & tubers	100.0	1.0	100.0	52.6	-47.4	127.2	27.2	78.3	-21.7	61.4	-38.6	60.5	-39.5	76.0	-24.0
GLVs	100.0	2.5	250.0	53.0	-197.0	91.1	-158.9	73.4	-176.6	41.3	-208.7	90.0	-160.0	69.8	-180.2
Other vegetables	100.0	1.0	100.0	99.2	-0.8	108.0	8.0	56.4	-43.6	63.9	-36.1	79.7	-20.3	81.4	-18.6
Fruits	100.0	2.0	200.0	39.7	-160.3	42.8	-157.2	7.9	-192.1	9.9	-190.1	23.0	-177.0	24.7	-175.3
Sugar Products	5.0	4.0	20.0	18.8	-1.2	19.3	-0.7	7.8	-12.2	5.0	-15.0	21.3	1.3	14.5	-5.5
Fats and oils	5.0	6.0	30.0	46.0	16.0	55.7	25.7	45.6	15.6	27.4	-2.6	38.2	8.2	42.6	12.6

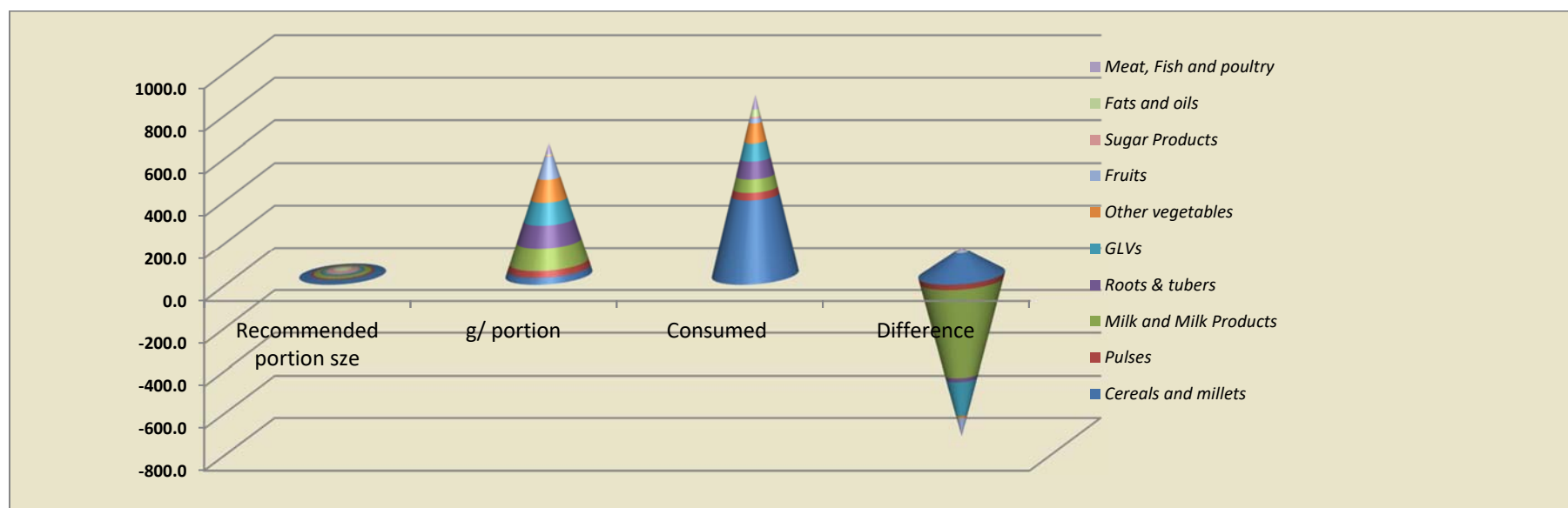


Figure 19.5 : Difference between consumed and recommended for Lactating mothers

19.3. Comparison of Recommended against consumed nutrient intakes for infants/children

19.3.1. Infants (6-12 Months)

The consumed nutrients intake is matched with the recommended one. For infants, it is shown in table and figure 19.6

Table 19.6: Difference between recommended and consumed Nutrient Intake by Infants 6-12 months

Nutrients	6-12 months			
	Recommended Quantity grams	Consumed Quantity	Difference	%age
Energy (kcal)	672.0	1231.7	559.7	83%
Protein (gm)	14.2	19.1	4.9	35%
Total Fat (gm)	19.0	75.0	56.0	295%
Calcium (mg)	500.0	151.0	-349.0	-70%
Iron (Fe) (mg)	5.0	2.1	-2.9	-58%
Vitamin A (mcg)	350.0	193.4	-156.6	-45%
Vitamin C (mg)	25.0	7.0	-18.0	-72%
Vitamin B12 (mcg)	0.2	0.6	0.4	190%
Zinc (Zn) (mg)	0.0	0.6	0.6	0%

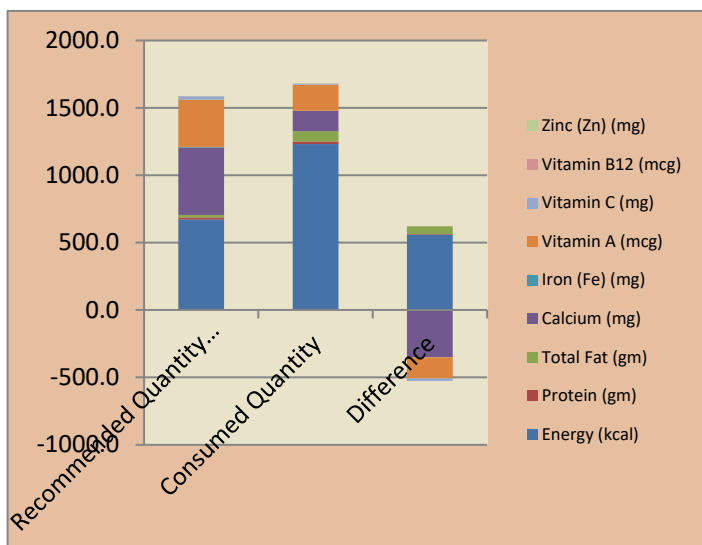


Figure 19.7 : Difference between recommended and consumed Nutrient Intake by Infants 6-12 months

©As predicted from the table and figure the The calories and protein intake for this group is fairly high by 83% and 35% respectively. The positive difference is shown in the consumption of total fat by 295% with a remarkable difference of 56grams. However in lieu of other important nutrients, the extra consumption from these nutrients

balances out. As the negative consumption is imperatively on higher sides especially in cases of calcium (-70%) iron(-58%) vitamin A (-45%) Vitamin C (-72). The vitamin B complex is consumed on higher side by 190% but all other negative difference would lay severe multi-micronutrient deficiencies.

19.3.2. Children (13-24 months)

The data is demonstrated in Table and figure 19.7

Table 19.7 : Difference between recommended and consumed Nutrient Intake by Infants 13-24 months

Nutrients	13-24 months			
	Recommended Quantity grams	Consumed Quantity	Difference	%age
Energy (kcal)	1060.0	1142.1	82.1	8%
Protein (gm)	16.7	18.5	1.8	11%
Total Fat (gm)	27.0	67.9	40.9	152%
Calcium (mg)	600.0	154.9	-445.1	-74%
Iron (Fe) (mg)	9.0	1.9	-7.1	-79%
Vitamin A (mcg)	400.0	153.7	-246.3	-62%
Vitamin C (mg)	40.0	6.5	-33.5	-84%
Vitamin B12 (mcg)	0.0	0.5	0.5	0%
Zinc (Zn) (mg)	5.0	0.6	-4.4	0%

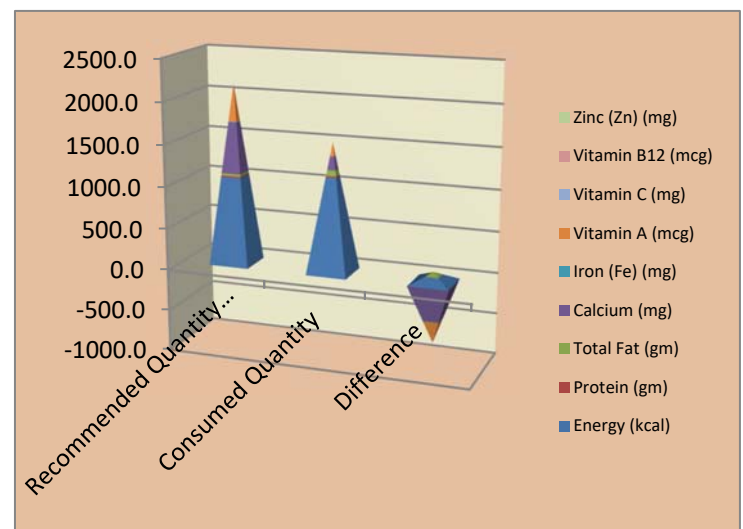


Figure 19.6: Figure 19.6 : Difference between recommended and consumed Nutrient Intake by Infants 13-24 months

As depicted the positive nutrient differences are shown by, energy, protein and total fat by 8%, 11% and 152%, however all the micronutrients are consumed drastically low than recommended

All minerals are consumed low by -75% and all the vitamins are consumed as low as -60-85%

19.4. Comparison of Recommended against consumed nutrient intakes for PLAs

For Pregnant, Lactating and Adolescent girls the data is illustrated in table and figure 19.8

19.4.1. Adolescent girls (12-18 years)

The consumption level of adolescent girls in the community by far, is poorest of all in terms of nutrient intake. As can be depicted from the table, there is no nutrients those are consumed with positive difference. All the consumed nutrients intake have shown the negative difference only

Energy are consumed -53% lesser than the recommended due to poor intake of diet and so does the protein consumption is. As there are low pulses, legumes and meat intakes in the community, the protein intake is reported as lower as -72% than the recommended one.

Fats are consumed a bit higher than the recommended one but those will run down to serve the purpose of energy.

All the significant minerals including calcium and iron is consumed low by -85% i.e. the normal calcium intake for this group is 800 mg however their diet only provide them 160mg

Similar is the case with iron, where the recommended level is 26.7 mg and is consumed only 4.2 mg

The poor intake of iron rich sources might lead to severe forms of Anemia. All the vitamin groups are consumed as low as -80%

19.4.2. Pregnant Mothers

The nutrient consumption level for both pregnant and lactating mothers are found same with negative difference in consumption of all the nutrients except for Fats which has the positive difference of about 21% and 2 % respectively.

Both pregnant and lactating age is serious physiological conditions and thus presses extra demands on body to fulfill the nutrient demands of growing fetus or infant. Calories normal requirement for a moderately heavy worker is 2230 kcal, both in pregnancy and lactation it is increased by 350 kcal and 600 kcal respectively. However, in cases reported, they are not even making it to 50% of the total calories requirement and are consuming only 42% of the dietary requirement for calories.

Similar is with protein, only 26% of recommended is consumed in both cases. The condition of Iron and calcium intake is drastically low by -82 to -88%. Vitamins are consumed only 12-15% of total RDA and iron is only 18% of rda is consumed.

19.5. Demonstration of the Balanced Plates

The balanced plates are demonstrated in tables 19.9-11 wherein the balanced diet is compared with the normal plate those are consumed in the community by different groups – Children (6-12 months and 13-24 months), Adolescent (12-18 years), and Pregnant and Lactating mothers

The plate difference gives the clear picture of the food group that is consumed in place of the other. It is clear from the table and figures, that the maximum portion of the diet as observed in field is taken over by cereals and grains rather having a diverse and rich-food of different groups

19.6. Balanced Diet and RDA

The Balanced diet for all the groups, studied during this research is provided in table 19.12 and 19.13

19.6.1. Recommended Dietary Allowance (RDA)

Recommended Dietary Allowance is shown in Table 19.12 for all age groups, Adult male and female and for pregnant and lactating mothers. The table is extracted from ICMR's RDA suggested in 2017. It recommends the amount of nutrient intake on a daily basis prescribed for a healthy living.

19.6.2. Recommended diet portions

Recommended diet portions are provided by National Institute of Nutrition, Hyderabad in Dietary Guidelines for Indians, revised 2012. This recommends the portion and grams of all the food groups to be consumed by an individual in order to be provided with the recommended nutrient intakes. This data is presented in table 19.13

Table 19.8: Difference between recommended and consumed Nutrient Intake by PLAs

Nutrients	12-18 Years Girls				Pregnant				Lactating			
	Recommended Quantity grams	Consumed Quantity	Difference	%age	Recommended Quantity grams	Consumed Quantity	Difference	%age	Recommended Quantity grams	Consumed Quantity	Difference	%age
Energy (kcal)	2260.0	1079.6	-1180.4	-52%	2580.0	1216.7	-1363.3	-53%	2580.0	1089.2	-1490.8	-58%
Protein (gm)	49.3	18.9	-30.4	-62%	78.0	22.1	-55.9	-72%	74.0	19.5	-54.5	-74%
Total Fat (gm)	36.7	32.2	-4.4	-12%	30.0	36.4	6.4	21%	30.0	30.5	0.5	2%
Calcium (mg)	800.0	159.6	-640.4	-80%	1200.0	177.5	-1022.5	-85%	1200.0	143.9	-1056.1	-88%
Iron (Fe) (mg)	26.7	4.2	-22.5	-84%	35.0	5.0	-30.0	-86%	21.0	3.7	-17.3	-82%
Vitamin A (mcg)	600.0	118.1	-481.9	-80%	800.0	126.4	-673.6	-84%	950.0	66.3	-883.7	-93%
Vitamin C (mg)	40.0	14.2	-25.8	-65%	60.0	12.3	-47.7	-80%	80.0	9.3	-70.7	-88%
Vitamin B12 (mcg)	1.5	0.1	-1.4	0%	1.2	0.1	-1.1	0%	1.5	0.1	-1.4	0%
Zinc (Zn) (mg)	10.7	2.5	-8.2	-77%	12.0	2.9	-9.1	-76%	12.0	2.6	-9.4	-78%

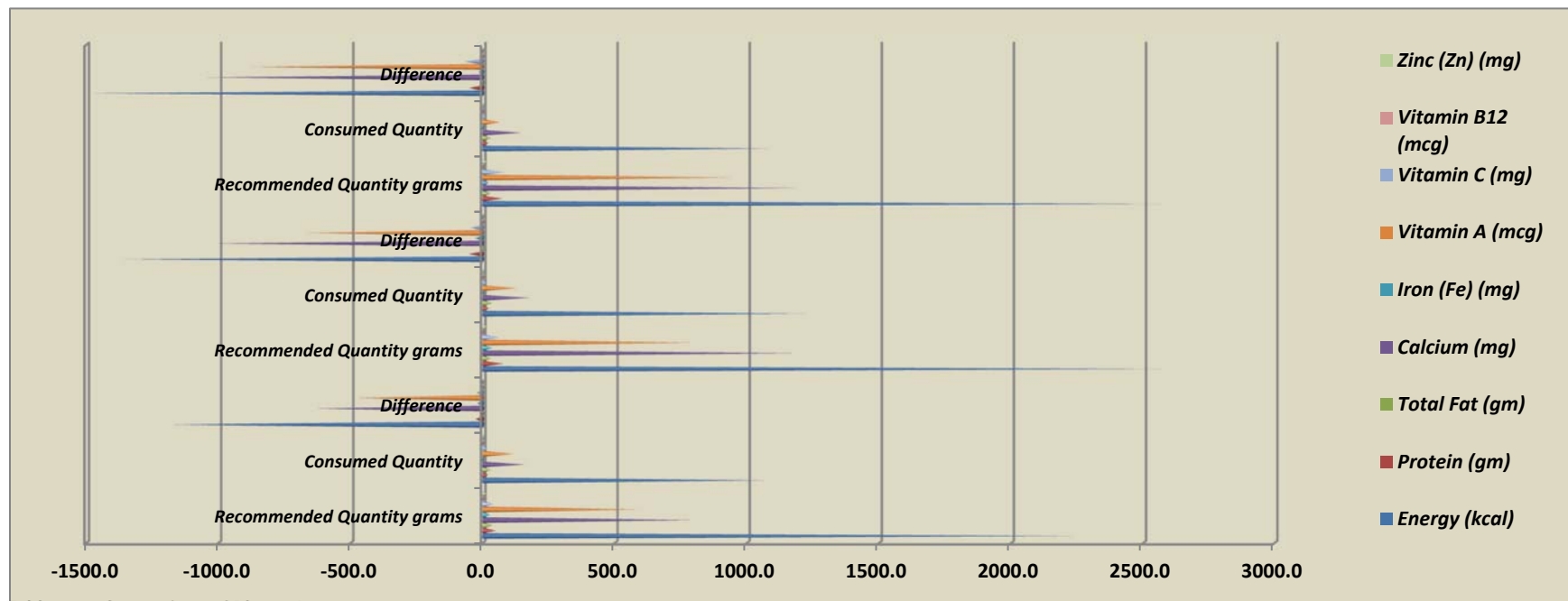


Table 19.9: Comparison of Plates -I

Figure 19.8: Difference between recommended and consumed Nutrient Intake by PLAs

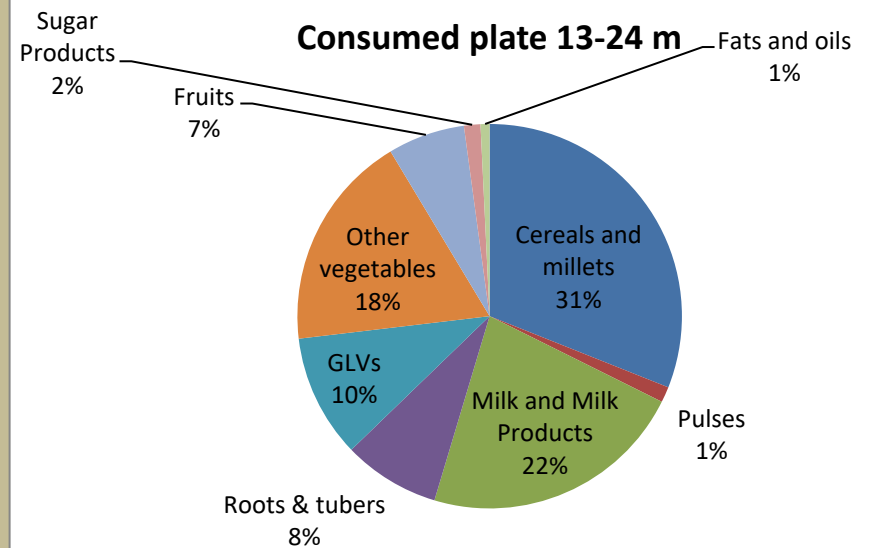
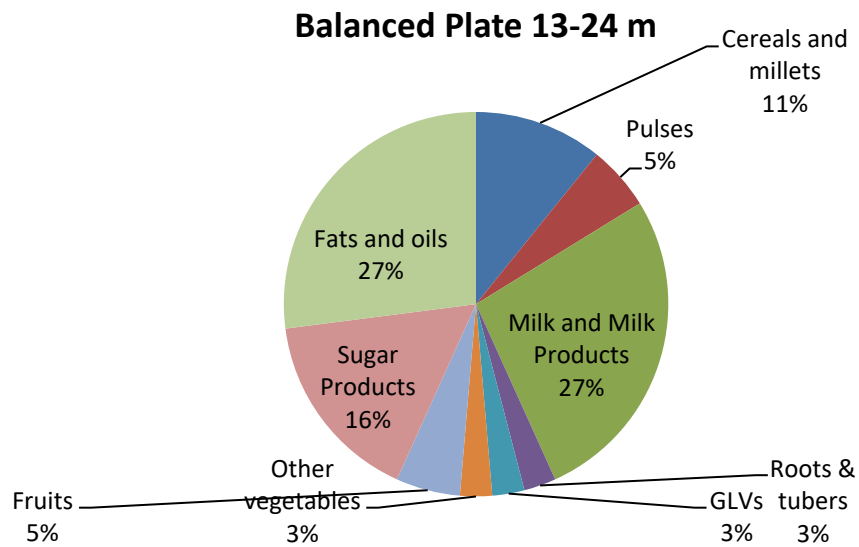
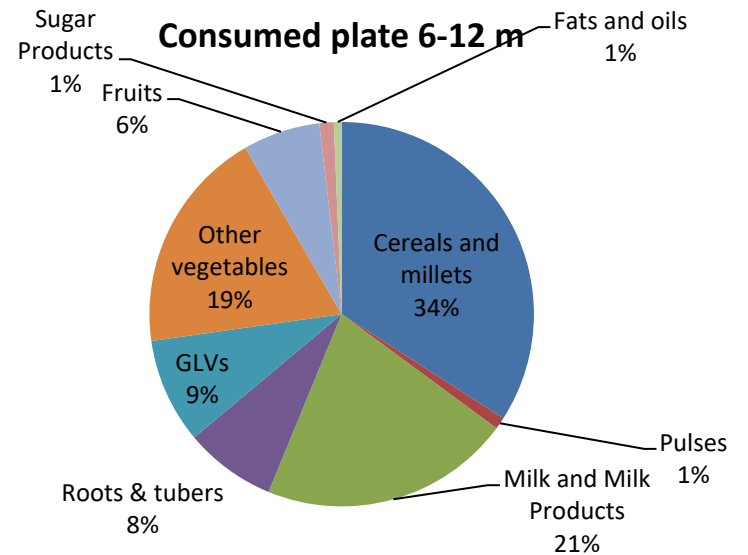
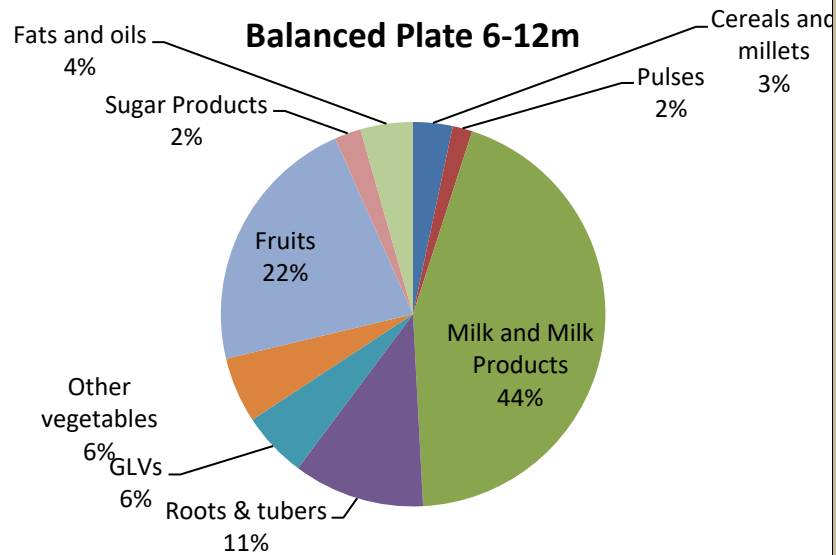
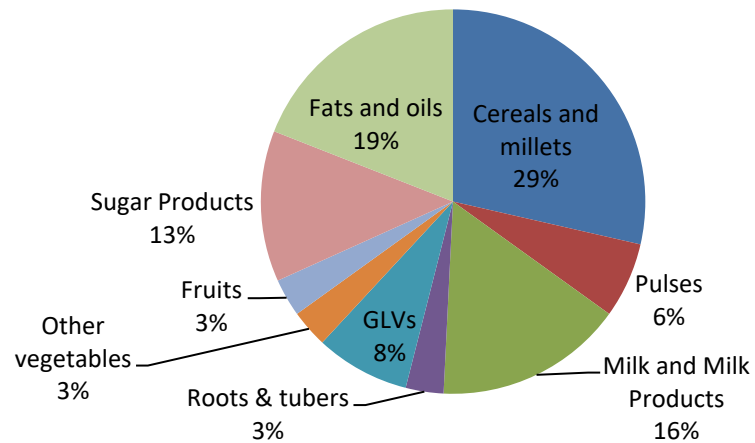
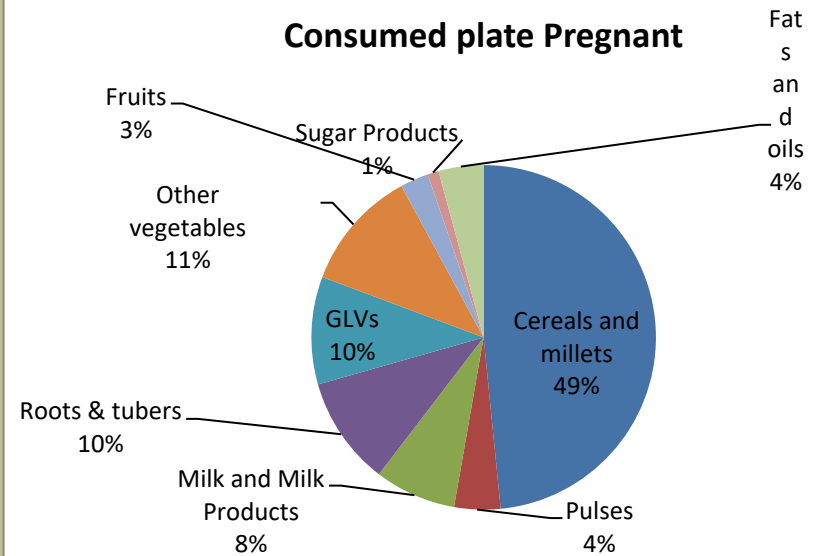


Table 19.10 : Comparison of Plates -II

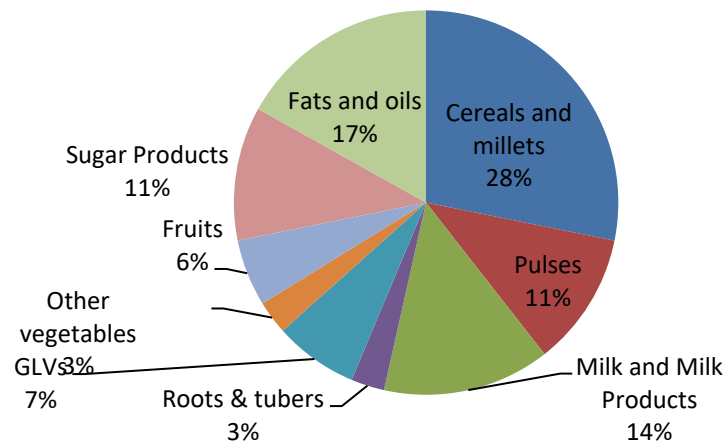
Balanced Plate Pregnant



Consumed plate Pregnant



Balanced Plate Lactating



Consumed plate Lactating

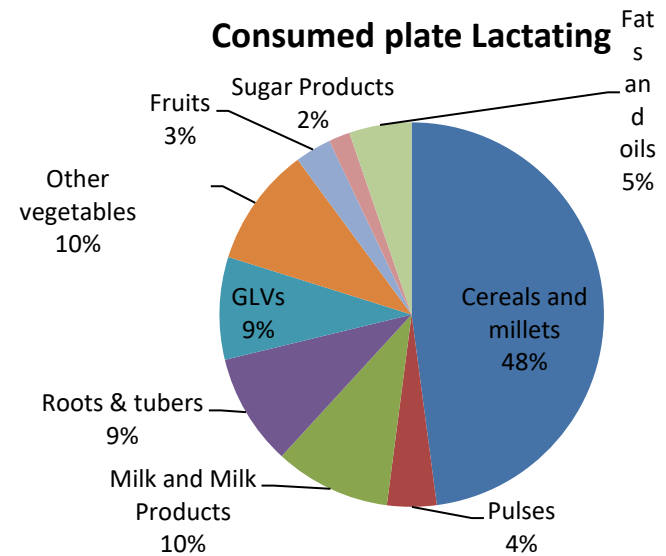


Table 19.11: Comparison of Plates -III

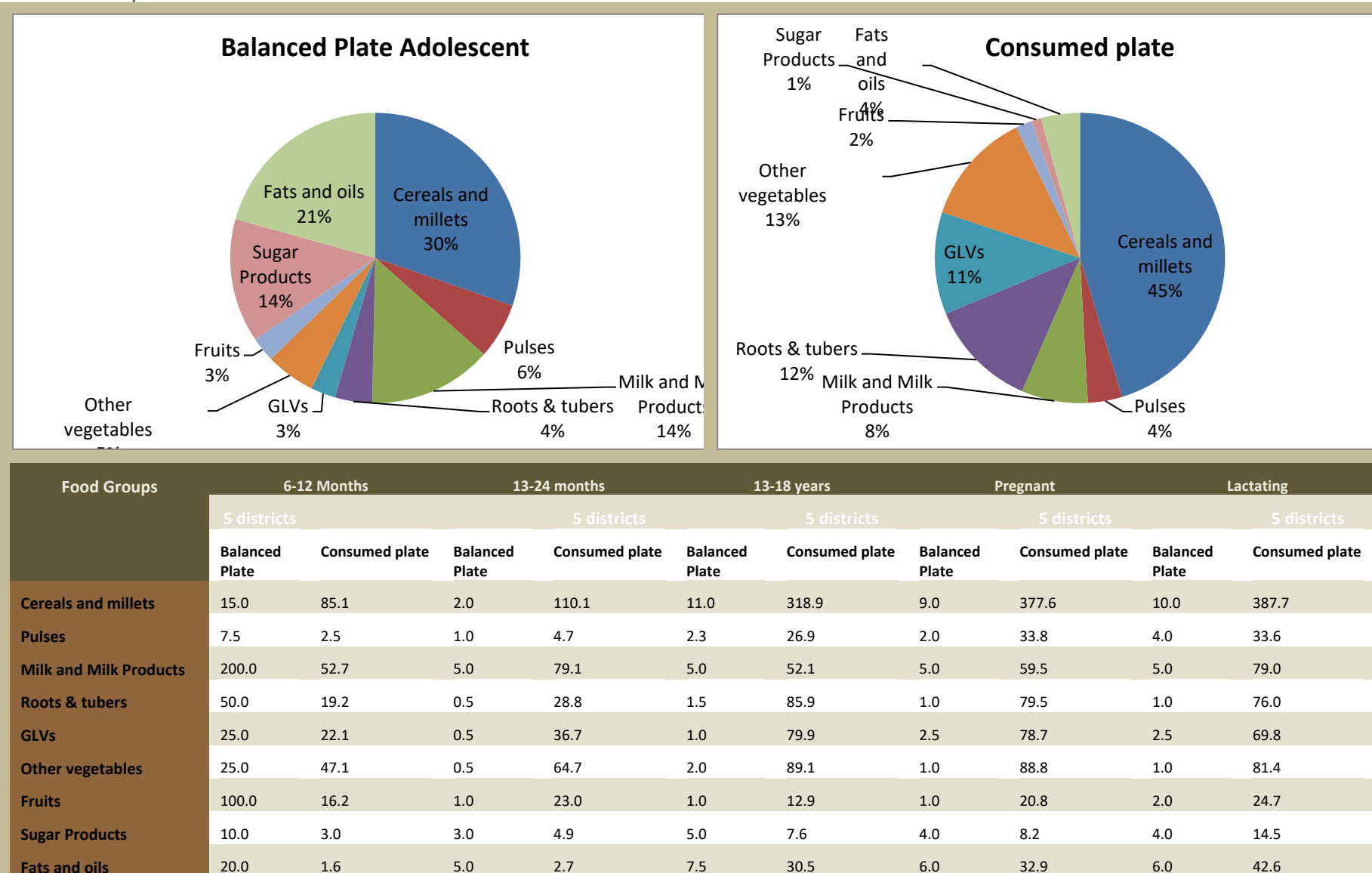


Table 19.12 : Recommended Dietary Allowance by ICMR 2017

Particulars	Body weight kg	Net Energy Kcal/d	Protein g/d	Visible Fat g/day	Calcium mg/d	Iron mg/d	Retinol	Carotene b	Thiamin mg/d	Riboflavin mg/d	Niacin equivalent mg/d	Pyridoxin mg/d	Ascorbic acid mg/d	Dietary folate g/d m	Vit.B ₁₂ g/d m	Magnesium mg/d	Zinc mg/d
Sedentary work	60	2320	60	25	600	17	600	4800	1.2	1.4	16	2.0	40	200	1	340	12
Moderate work	60	2320	60	25	600	17	600	4800	1.4	1.6	18	2.0	40	200	1	340	12
Heavy work	60	2320	60	25	600	17	600	4800	1.7	2.1	21	2.0	40	200	1	340	12
Sedentary work	55	1900	55	20	600	21	600	4800	1	1.1	12	2.0	40	200	1	310	10
Moderate work	55	2230	55	25	600	21	600	4800	1.1	1.3	14	2.0	40	200	1	310	10
Heavy work	55	2850	55	30	600	21	600	4800	1.4	1.7	16	2.0	40	200	1	310	10
Pregnant woman	55	+350	+23	30	1200	35	800	6400	+0.2	+0.3	+2	2.5	60	500	1.2	310	12
Lactation	55	+600	+19	30	1200	21	950	7600	+0.3	+0.4	+4	2.5	80	300	1.5		
0-6 months																	
6-12 months	55	+520	+13	30	1200	21	950	7600	+0.2	+0.3	+3	2.5	80	300	1.5		
0-6 months	5.4	92	1.16	—	500	46	--	--	0.2	0.3	710mg/kg	0.1	25	25	0.2	30	—
6-12 months	8.4	80	1.69	19	500	5	350	2800	0.3	0.4	650mg/kg	0.4	25	25	0.2	30	—
1-3 years	12.9	1060	16.7	27	600	09	400	3200	0.5	0.6	8	0.9	40	80		50	5
4-6 years	18	1350	20.1	25	600	13	400	3200	0.7	0.8	11	0.9	40	100		70	7
7-9 years	25.1	1690	29.5	30	600	16	600	4800	0.8	1.0	13	1.6	40	120		100	8
10-12 years	34.3	2190	39.9	35	800	21	600	4800	1.1	1.3	15	1.6	40	140	0.2-1.0	120	9
10-12 years	35.0	2010	40.4	35	800	27	600	4800	1.0	1.2	13	1.6			0.2-1.1	160	9
13-15 years	47.6	2750	54.3	45	800	32	600	4800	1.4	1.6	16	2.0	40	150	0.2-1.2	165	11
13-15 years	46.6	2330	51.9	40	800	27	600	4800	1.2	1.4	14	2.0			0.2-1.3	210	11
16-17 years	55.4	3020	61.5	50	800	28	600	4800	1.5	1.8	17	2.0	40	200	0.2-1.4	195	12
16-17 years	52.1	2440	55.5	35	800	26	600	4800	1.0	1.2	14	2.0			0.2-1.5	235	12

Table 19.13: Recommended Food portions by NIN, 2012

Food groups	g/ portion	Infant				Children			
		6-12 month		1 - 3 y		4 - 6 y		7 - 9 y	
		Recommended portion size	Recommended Quantity grams	Recommended portion size	Quantity required	Recommended portion size	Quantity required	Recommended portion size	Quantity required
Cereals and millets	30.0	0.5	15.0	2.0	60.0	4.0	120.0	6.0	180.0
Pulses	30.0	0.3	7.5	1.0	30.0	1.0	30.0	2.0	60.0
Milk and Milk Products	100.0	2.0	200.0	5.0	500.0	5.0	500.0	5.0	500.0
Roots & tubers	100.0	0.5	50.0	0.5	50.0	1.0	100.0	1.0	100.0
GLVs	100.0	0.3	25.0	0.5	50.0	0.5	50.0	1.0	100.0
Other vegetables	100.0	0.3	25.0	0.5	50.0	1.0	100.0	1.0	100.0
Fruits	100.0	1.0	100.0	1.0	100.0	1.0	100.0	1.0	100.0
Sugar	5.0	2.0	10.0	3.0	15.0	4.0	20.0	4.0	20.0
Fat/ oil (visible)	5.0	4.0	20.0	5.0	25.0	5.0	25.0	6.0	30.0
Food groups	g/ portion	Adolescent				Adult women		Adult Men	
		13-18 years Girls		13-18 years Boys		Recommended portion size	Quantity required	Recommended portion size	Quantity required
		Recommended portion size	Quantity required	Recommended portion size	Quantity required				
Cereals and millets	30.0	10.0	300.0	14.5	435.0	9.0	270.0	12.0	360.0
Pulses	30.0	4.0	120.0	2.8	82.5	2.0	60.0	2.0	60.0
Milk and Milk Products	100.0	5.0	500.0	5.0	500.0	3.0	300.0	3.0	300.0
Roots & tubers	100.0	1.0	100.0	1.8	175.0	1.0	100.0	1.0	100.0
GLVs	100.0	2.5	250.0	1.0	100.0	2.0	200.0	2.0	200.0
Other vegetables	100.0	1.0	100.0	2.0	200.0	1.0	100.0	1.0	100.0
Fruits	100.0	2.0	200.0	1.0	100.0	1.0	100.0	1.0	100.0
Sugar	5.0	4.0	20.0	5.0	25.0	4.0	20.0	5.0	25.0
Fat/ oil (visible)	5.0	6.0	30.0	9.5	47.5	4.0	20.0	5.0	25.0
Food groups	g/ portion	Pregnant		Lactating					
		Recommended portion size		Quantity required		Recommended portion size		Quantity required	
Cereals and millets	30.0	9.0		270.0		10.0		300.0	
Pulses	30.0	2.0		60.0		4.0		120.0	
Milk and Milk Products	100.0	5.0		500.0		5.0		500.0	
Roots & tubers	100.0	1.0		100.0		1.0		100.0	
GLVs	100.0	2.5		250.0		2.5		250.0	
Other vegetables	100.0	1.0		100.0		1.0		100.0	
Fruits	100.0	1.0		100.0		2.0		200.0	
Sugar	5.0	4.0		20.0		4.0		20.0	
Fat/ oil (visible)	5.0	6.0		30.0		6.0		30.0	

E. SECTION FOUR – CONCLUSION AND RECOMMENDATION

20. Chapter Twenty – Nutritional Indices

Nutritional indices mean evaluation and measurement of nutritional variables in order to assess the level of nutrition or the nutritional status of the individual. Based on the findings, this chapter concludes the nutritional status of women and girls in the studied area.

20.1. Energy Deficient Status

As presented in table 19.12, RDA states that the least requirement of energy for the studied group is 2010 Kcal for the girls from age group 12-18 years of age. However, the least calories those are recorded from field are lesser than 500 kcal and are consumed by lactating mothers those who are severe underweight. The details are shown in concluding table where + sign is used to show the degree of severity. 144 such cases have been recorded, to have been consuming energy deficient diets where 47 cases are pregnant; 48 are adolescent and 49 are lactating.

Concluding Remark :

Acute **energy deficiency** (AED) is associated with body **weight loss**, along with changes in body composition, as well as a reduced BMR and physical activity. They adapt to the decreased food **energy** by reductions in their total **energy** expenditure (TEE), linked mainly to a lower body size, and to their physical activity.

96 percent of the surveyed population and 22 percent of total PLAs of the regions (666) are found to have been suffering energy deficient. The list of reduced BMI is already produced in Annexure-

20.2. Protein Deficient Status

The least recommended protein as per RDA (19.12) is 40.4 grams a day for adolescent girls (10-18 years), whereas 148 cases have been recorded those who have been consuming lesser protein than recommended. Only 2 cases have been reported to have been consuming more than 40 percent

Concluding Remark :

99 percent of surveyed and 22 percent of total PLAs are protein deficient cases. There is an acute need of community breakthrough here.

Disorders caused by a protein-deficient diet occurring shortly after birth and lasting a relatively long time. In such diets there is generally an overall calorie deficiency. If life continues for a prolonged period, under these conditions it is observed that the rate of growth slows down and the tissues are late in attaining biochemical maturity. It is important to note that growth slows down to a varying degree in different organs and the phenomenon is more marked in the muscles and bones than in the kidneys (Widdowson, Dickerson & McCance, 1960).

As 49 pregnant women are reported to have been consuming protein deficiency diet it is important checkpoint to see the status of newly born in terms of weight and other nutrition parameters. It might lead to maternal death for causing anemia and PPH or might lead to low-birth weight

20.3. Protein-Energy Undernutrition

87 such cases have been recorded those who suffered severe form of both protein energy malnutrition .

32 adolescent 29 lactating and 22 pregnant from PLA group s suffering PEU, where they are consuming protein lesser than 20 grams a day and calories lesser than 1200 kcal a day.

Concluding Remark

58 percent of surveyed and 13% of total PLAS are PEU. The protein energy malnutrition both affects the body functioning energy levels and growth levels. As PLA is vulnerable group where demands on body needs increases, tend to have consuming lesser than recommended affect the overall physical and mental growth.

20.4. Calcium Deficiency

RDA states 800mg of Calcium to be consumed per day for healthy bone functioning for adolescent girls 12-18 years and it is more in case of Pregnant and Lactating however not a single case from the studied population have matched to 800mg/day. All the cases i.e.150 of 150 are reported to have been consuming lesser than 600mg of calcium a day.

SN	Nutritional indices	Number consuming lesser than recommended	% from total PLAs	% from surveyed PLAs	Degree
1	Energy deficient	144.0	22%	96%	
	Consuming lesser than 1000kcal	63.0	9%	42%	Severe ++
	Consuming lesser than 500 kcal	15.0	2%	10%	Severe+++
	Consuming between 1000-1500	61.0	9%	41%	Moderate ++
	Consuming 1501-1999 kcal	20.0	3%	13%	Moderate
2	Protein Deficient	148.0	22%	99%	Moderate ++
	Consuming between 30-40 grams	71.0	11%	47%	Severe +
	Consuming between 20-30 grams	58.0	9%	39%	Severe ++
	Consuming lesser than 10 grams	18.0	3%	12%	Severe+++
3	Protein-Energy Undernutrition	87.0	13%	58%	Severe+++
4	Calcium Deficient	150.0	23%	100%	Severe+++
	Consuming between 350mg - 600mg	75.0	11%	50%	Severe+++
	Consuming lesser than 150mg	68.0	10%	45%	Severe+++
	Consuming between 150mg - 350mg	4.0	1%	3%	Severe+++
5	Iron deficient	150.0	23%	100%	Severe+++
	Consuming lesser 5mg	109.0	16%	73%	Severe+++
	Consuming lesser between 5mg - 10 mg	39.0	6%	26%	Severe+++
6	Vitamin A deficient	148.0	22%	99%	Severe+++
	Consuming between 100mcg- 600 mcg	37.0	6%	25%	Severe+++
	Consuming lesser than 100 mcg	111.0	17%	74%	Severe+++

Concluding Remark

Hundred percent of surveyed population and 23 percent of total plas are reported to have been consuming calcium deficient diet

Hypocalcemia, commonly known as calcium deficiency disease, occurs when calcium levels in the blood are low. A

long-term deficiency can lead to dental changes, cataracts, alterations in the brain, and osteoporosis, which causes the bones to become brittle. Complications of hypocalcemia can be life-threatening, and if the condition goes untreated, it could eventually lead to death. A calcium deficiency may have no early symptoms.

Calcium rich diet and calcium supplementation is highly recommended

20.5. Iron Deficiency

The east recommended iron consumption values for a day is 21mg per day by Lactating mother in the group whereas the least consumed iron quantity as reported from the field is 0.3 mg per day which s 1.428% of the total required RDA. With this level comes the crucial deficiency status.

None of the cases made out to even half of the RDA i.e. 10.5 mg per day All the 150 subjects have reported to have consumed the diets deficient in iron to lower than 10 mg a day. All pregnant, lactating and adolescent girls are consuming lesser than 10mg per day

Concluding Remark

73 percent of studied and 16 percent of total PLAs are severe iron deficient for consuming lesser than 5 mg per day. For prolonged duration if iron-deficient diet is consumed it might lead to iron-deficiency disorders. Iron deficiency occurs when the body doesn't have enough of the mineral iron. This leads to abnormally low levels of red blood cells.

That's because iron is needed to make haemoglobin, a protein in red blood cells that enables them to carry oxygen around the body.

Iron deficiency anemia arises when the balance of iron intake, iron stores, and the body's loss of iron are insufficient to fully support production of erythrocytes. Iron deficiency anemia rarely causes death, but the impact on human health is significant.

Iron deficiency anemia is associated with some rather striking neurological squeal. Some subjects possess the compulsion to move their lower extremities while at rest. The restless leg syndrome is now recognized as a reversible symptom of reduced brain iron levels that is particularly prevalent during pregnancy (Vivarelli et al. 1976; Goodman et al. 1988). Pica is another associated neurological co morbidity. Pica is defined as dietary compulsions for materials that may not usually be consumed in the diet of humans without iron deficiency.

The molecular basis for this unusual behavior is unknown. Iron deficiency is also known to cause cognitive dysfunction. Neurological damage is particularly relevant during infancy brain development. Long-lasting cognitive challenges occur

despite therapy later in life (Lozoff et al. 1991). Therefore, iron deficiency anemia during infancy should be aggressively treated to avoid the potential for cognitive problems.

20.6. Vitamin A Deficiency

The recommended dietary allowance for Vitamin A is 600mcg a day is the least requirement amongst the group. However, the least consumed Vit. A level is reported to be 3mcg that is 2 % of the RDA.

Of 150 subjects, 148 have been consuming lesser than 500 mcg of Vitamin A per day. All pregnant and lactating mothers and 48 adolescents are consuming lesser vitamin a than recommended. 111 cases are even consuming lesser than 100 mcg per day

Concluding Remark

Ninety –nine percent of total surveyed and 22% of total PLAs have been suffering Vitamin A-deficiency with the magnitude of severity as for not consuming Vitamin A rich diet for a prolonged period.

Vitamin A deficiency has a plethora of clinical manifestations, ranging from xerophthalmia (practically pathognomonic) to disturbances in growth and susceptibility to severe infection (far more protean). Vitamin A deficiency is the leading cause of preventable childhood blindness and increases the risk of death from common childhood illnesses such as diarrhoea. Periodic, high-dose vitamin A supplementation is a proven, low-cost intervention

21. Chapter Twenty-One – Comprehensive Indices

Based on the chapters covered during the study, the study is like-wise concluded –

21.1. Demographic stats

The study area and studied population is predominately tribal rich area wherein total studied population is comprised of 74% of Scheduled caste followed by 10% of Scheduled caste and 16% of OBCs and others. Also the population stats clarifies the female to male sex ratio, computed as 960 males for 1000 females which is reverse of the entire state and nation i.e. 931 females for 1000 males and 940 females for 1000 males respectively. However the values are contrasting for case of Rewa wherein for every 1000 males, the number of female are computed as 861.

Concluding Remark:

This is entry key-point for cross checking the female feticide issues. This signifies the result derived from this study holds true and dominant for ST with a mean of ± 5.2 i.e. the result might be varying with a degree of 5.2 between the entire set of data. Moreover the predominant tribes identified during the study are Gond (49%) then khairwar (19%), Mawasi (12%) Kol(9%), Saur (5%) and OBCs and others(6%) thus the results hold true respectively.

21.2. Infrastructure and Essentials

The community in Niwari sets out an exception in having adapted to new structures, whereas, the other tribes still striving for their basic housing settlements and needs, wherein despite of owning the house they are deprived of basic necessities at large. Sixty eight percent still struggle with kachha houses however provided with electricity but due to excess load shedding unable to be privileged with the facilities. With the advent of information technology 78 percent has reached out to mobile but lag out on having agriculture equipments (only 2 %). The connectivity to the external world is still at stake due to distance of the villages which is far off the well-connected towns, and the only way to reach out is auto or other public conveyance giving extra shocks to pockets, reducing the expenditure percentage on health and nutrition simultaneously. Awareness regarding to having bank, samgra and aadhar card have increased by 80-90% because the essential government facilities are provided based on these documents. Still 10-20% isn't aware or is not willing to document their information.

Sixty-percent of the households have reported to own agricultural land by 61% more than 13% as recorded for rural MP (NFHS-4)

Education wise, the studied population is 72% literate for the entire districts where in 42% reached primary; 21% have attended high school and others are atleast literate against 28% illiterate. The literacy rate of tribes is found however more than that of MP with 70.6%

In regards to livelihood, 64% are dependent on labor; 35% derive income from agriculture and very few are dependents on any other livelihood opportunities present in the respective state. As zero or no livelihood opportunities are present in the studied area, 53% of the families are recorded to migrate in the metro-cities for better job chances. The employment rate is only 1% compared to 39.5% of entire state.

Concluding Remark:

Stipulation of vital amenities and admittance to these for the socio economically deprived segments in the society is an influential aspect in establishing the expansion of the community. Primary facilities such as education, housing, livelihood, transport will augment wellbeing and are crucial in spite of their effects on efficiency. The efforts are required to scale up their housing, literacy and employment conditions which in due course put in to enhancement of quality of life. For further progressive results, a need-based, participatory and two-way approach is the need of the hour, which would go a long way to advance the value of life of these Tribes.

21.3. Health and WASH

As the study has revealed that 75% for the community rely on hand-pumps for drinking water whereas 26% are even drinking from unprotected wells; 37% from public taps. However during discussion 90% of the HHs report of not using and treating their water before drinking. This accounts to 75% of total population those who have been drinking from improved water services compared lower than that of MP (89%-NFHS-4)

Just about twenty three percent of these families have any sort of toilet facilities which is lesser than half the entire state (49%-NFHS-4) . Functionality is altogether a different question; only 5% of the households having toilets are using those for defecation whilst the open defecation is practiced by 23% still lower than MP's ODF rate i.e. 25% ³⁶

³⁶ Source: [RICE](https://www.indiaspend.com/after-4-years-of-swachh-bharat-open-defecation-down-26-percentage-points-but-toilet-use-does-not-match-construction-spree-false-claims-evident/#:~:targetText=Bihar%20at%2060%25%20and%20Rajasthan,the%20lowest%20rate%2D%2D25%25); Figures in percentage of households, <https://www.indiaspend.com/after-4-years-of-swachh-bharat-open-defecation-down-26-percentage-points-but-toilet-use-does-not-match-construction-spree-false-claims-evident/#:~:targetText=Bihar%20at%2060%25%20and%20Rajasthan,the%20lowest%20rate%2D%2D25%25>

Out of 1374 individuals participated in the study, 11% got sick in the past 15 days before the study took place. One percent of the children suffered fever with chills and rashes. Fever is a symptom of malaria, but it is also associated with other childhood illnesses that may contribute to high levels of malnutrition, morbidity, and mortality in young children. The prevalence of fever peaks at 20 cases among individual ranging from 18-30 years. Five cases also reported diarrhea which could be reason of unhygienic conditions arouse during monsoon.

Exposure to even smoke of tobacco if not consuming, can have severe health consequence for a prolonged duration. Forty-eight respondents report smoking against 37% where someone smokes inside the house on daily basis which is way higher than the smoking rate reported under the same category by NFHS-4 (29%). The condition ranges between 48-64% in the districts taken in the study. Regards to safety from malaria and using mosquito nets 56% of the family have been reported to be provided with mosquito nets but usage is confined to 27% only.

Concluding Remark:

Water, sanitation, and hygiene practices are few of the major grounds of morbidity and mortality in children. This study found a need for upgrading WASH practices of the people of the tribal communities undertaken in the study, especially those related to the use of unprotected wells, cleanliness around water bodies, disposal of waste using, sanitary toilets, hand washing, and water treatment practices. Enhanced incorporation into the civilization with a successive augment in access to cleanliness and sanitation infrastructure, monetary schemes, and instructive interventions is necessary for further improvements. A community-based intervention program needs to be conducted to school the tribal people on the subject of apposite water storage and retrieval techniques and, sanitation and hand washing practices.

21.4. Maternal Health

Visit to Anganwadi centers is important in terms of being connected with the latest health updates and facilities provided by Government. Eighty-seven percent of PLAs are recorded to have been visiting Anganwadi centers frequently and are receiving THR and counseling timely. Amongst the groups, pregnant mothers are more aware and particular for visiting AWCs (92% of total pregnant women)

Status of IFA consumption is seen limited to 74% amongst total PLA group. IFA tablets are consumed only by 28% of pregnant and lactating mothers and 16% of adolescent girls, lower against Mp state where 30% of pregnant women are consuming IFAs .

Institutional deliveries in an important indicator in determining the maternal mortality rate because of the

services provided during birth, lack of which may cause PPH and may further register complication and even lead to death. As the data interprets, of 100 samples (50 infants and 50 children participated in the study), 92% had institutional deliveries which is more than those of MP (75%-NFHS-4) It is evident that half of the population consumes meals only twice a day out of which 72% are pregnant and lactating and 28% are adolescent.. Rest patterns are reported to have been normal for the studied regions. More than 79% of the women and girls are reported to have been resting for a period of 2 hours.

Concluding Remark:

The maternal status in terms of institutional deliveries is better but eating patterns and IFA consumption patterns to be improved varyingly in order to improvise the nutritional status

21.5. IYCN

It is extremely important for establishing successful lactation as well as for providing "Colostrums" to the newborn. Ideally the new-born should receive the first breastfeed soon after the birth preferably within half an hour. As it is active during first one hour and may learn suckling fast. Early suckling speeds up the milk formation process, further early secretion and better milk flow.

The condition of early initiation of breastfeeding as recorded in the study is confined to 48% of infant and children were breastfed within an hour (Early initiation of breastfeeding) which is higher than MP's rate (43%-NFHS-4). Contrary to which 19% were breastfed between 1-2 hours against 33% of infant and children who were breastfed after 4-5 hours. Pre-lacteal feed is computed for 76% of breastfed children higher against 12 % of MP. Moreover exclusive breastfeeding is attained by 65%, higher than 54% of MP state. Additionally 43% of the populations have reported to have been following complimentary feeding practices again higher than 38% of MP

Concluding Remark:

This is however evident from the study IYCN are in better strata compared to MP data as a whole, still the education and awareness level of performing breastfeeding practices and ways of complimentary feeding is very blurred amongst tribal women. The early initiation of breastfeeding can be improvised a lot but leased out in the name of deity for which the colostrums is sacrificed rather than feeding it to new-born. These fads to be removed in order to attain the best of health on children are initiating life days.

21.6. Height and Weight Measures

The children's height and weight are recorded and plotted against the z-score charts provided by WHO in order to

extract their malnutrition levels. The prevalence of Undernutrition is almost the same among girls and boys. Over 52% of studied children reported to be stunted against 38% of MP; 58% are wasted which is way higher than overall wasting status of MP (21%). Contrary to this underweight rate is reported 23% which is lower than entire state (36%)

The BMI of the PLAs have been plotted on graphs and WHO standards. The percentage of women suffering from

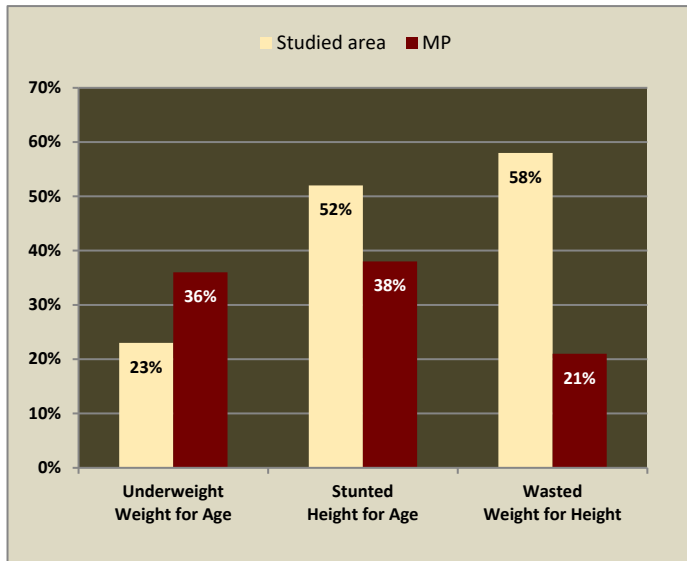


Figure 21.1: Trends of Under-nutrition : COMparison with NFHS-4 (All age groups and physiological condition)

Fourteen percent of Pregnant women, thirty-two percent of lactating mothers and 54% of adolescent girls are recorded thin i.e. to have BMI lesser than 18.5 against 23% of entire MP. Except for pregnant mothers, both lactating and adolescent have higher rates of underweight rates than MP state

Mean weight is computed as 48.2 kgs and 44.2kgs for both pregnant and lactating mothers which is only 88% of the recommended weight by ICMR and that of adolescent 39.4 kgs against recommended (45 kgs). Similarly mean height is 149 cms which is higher than average of 142 cms (MP-NFHS 4)

Concluding Remark:

As observed in the study, the major cause of the low nutritional status is both the dietary and nutrition patterns of both mother and children which is not up to the standards and are very low than recommended which is affecting the children in long run. It is proven through researches that children born to thin mothers (BMI less than 18.5 kg/m²) are more likely to be stunted, wasted, and underweight than

children born to mothers with a normal BMI or children whose mothers are overweight/obese³⁷. Thus, intervention is required on this part to provide awareness, education and improvising the continuous growth monitoring of the children in order to bring change to the current trend.

21.7. Clinical Assessment

Physical signs and symptoms of malnutrition can be valuable aids in detecting nutritional deficiencies. These include physical appearance, Pallor of the skin, mucous membrane surfaces, sides of eyes and mouths, nail beds etc. The sooner the signs get detected and the diagnose is made the faster the nutritional status can be improved and public health interventions can be formulated. About 26% looked undernourished and 14% who look severely malnourished; 54% have dull, lusterless hairs mostly dry and scaly; 40% of them have pale eyes and conjunctiva i.e. injected conjunctiva and results from anemia; 6% wounds on sides of mouth. Dyspigmentation of face with loss of skin color is reported by 24%; 10% of the total sampled population has swollen, and red tongue and dryness of skin with patches is observed in 12% of the children/infants studied. Additionally 8% of the interviewees suffered cold and cough against 6% those who suffered diarrhea and vomiting for the similar conditions.

Concluding Remark:

The clinical signs are the shout outs of some underlying serious body phenomenon that is being altered by certain deficiencies. Medical and biochemical investigations of these subjects are recommended in order to save them from any further negative and non-reversible physiological conditions.

21.8. Traditionally Available Foods

There are total two seventy (270) food items spotted from the field data out of which two thirty four (234) food consumed by communities studied, are identified and tabulated against thirty six (36) items those remained unidentified. The details are covered in chapter fifteen. The concluding point is the community is resource rich but accessibility to certain traditional foods are refrained due to forest acts or distance from the jungle. These traditional foods are recorded to have rich source of micronutrients and should be encouraged through regular diet.

The concerning part is, the new generation is not that aware of the benefits and gains coming from traditional foods. The pattern of consuming such food is observed to be vanishing slowly. Sooner will be time when these foods will be blurred out completely. For instance, the elderly during FGDs have

³⁷ NFHS-4, International Institute for Population Sciences (IIPS) and ICF. 2017. National Family Health Survey (NFHS-4), 2015-16: India. Mumbai: IIPS.

reported to have been consuming kodon kutki sanwa (millets) which have their own nutritional statements, in high regards for that provide them dense source of energy and they feel energetic throughout the day, which when asked from the young adults, registered with different perspective. The young adult women on a comparative note never showed preferences towards the previously existing traditional food because consuming them demands lot of hard work which is at bay for them, evident by elderly women from the community.

The other reasons could be the taste and preferences which has been turning towards the ready made cereals (rice and wheat) due to lesser inputs and as the seeds are vanishing out, water resources have depleted over the years causing them to settle with the later food groups.

As far as animal origin foods are concerned, it was reported that huge animal meat was used to be incorporated in the diet in earlier days than now for those were available in back golden days and forest was not posing that much refraining them the access. However the consumption is still made, when they encounter certain animals (Consumable), they hunt them and cook to feed the starving stomachs.

Amongst the season, the best time for them is winter because all the greens are blossomed and tribal love to munch on leaves more than anything else, as for them it provides "vitamins".

Concluding Remark:

The basic nature of tribes is consuming the local food which should be promoted through community gardening and reincarnating the traditional and conventional farming before it's too late to be vanished

21.9. Food security

The tribal are recorded to have been food insecure when it comes to access, utility and utilization. The food is available somehow but outreach to the plate is not direct as the study shows.

The harvesting cost on cereals and grains is computed as 5225 INR per household and that of pulses is 4968. The millet cost around 3840 INR whereas roots and tubers cost them around 2500 INR. This is the production cost to be borne by the farmers on an acre of land, provided irrigated fields. The rest of the food items are consumed from the market or collected from the jungle. The total household consumption that comes from purchase is 123.7 kilograms of food including all the food groups like cereals, millets, vegetables, milk and milk products, pulses legumes etc. against the total quantity that is consumed from the production of about 75.8 kilograms and that from collection is 54 kilograms in winter making the total consumption of 253.5 kgs per household per month,

Monthly Per Capita Consumer Expenditure) on food is recorded as 2108.943 INR is higher against 1430 INR in rural and lower against 2630 INR in urban by NSSO. As per NSSO 2012, in rural India, average monthly per capita cereal consumption was around 10.0 kg for the poorest 10% of the population whereas in the study it is computed as 10.73 kilograms on cereals for the studied population. As the NSSO data suggested results from 2012, there must be inclining pattern recorded for the year 2019. In either case, the MPCCE for food is higher than the normal computed for rural by NSSO so this concludes the changing scenario on income and expenditures as well.

The accessibility to food products is confined to 41% from harvesting 77% to purchasing and 40% from collection of food stuffs from jungle. A large portion is collected in the form of NTFP which serves the major nerves in the economical backbone to the rural household

21.10. Dietary and nutrients Patterns

The diets of these communities of all the villages primarily consist of cereals and vegetables and tubers especially potato as it provides bulk to the food mostly deprived of pulses. Among cereals, their diet is confined to rice and wheat. In some cases maize and Jowar are also consumed. Additionally tribes of Umaria are found to have been consuming kodo kutki which is exceptional case to rest of the districts. Corns are also prevailing there. The traditional ways of cooking cereal for them is confined to hand-made chapati. They do not use rolling pin to roll the chapattis rather.

Earlier they had a tendency of preparing gruel or pej of bajra and maize; consuming them while going out on heavy work. This suggested being the most energy giving thing for them. The tradition is almost chucked out now and is replaced with chapatti.

The pulses consumption is sheer low and is limited to twice a week with much diluted consistency with extra spices of mostly tuar or urad or moong dal. Vegetable consumption comparatively is higher than anything else. Rice consumption has taken over the plates over decades for its easy to cook and serve properly plus cheaper price is an add on.

Tea consumption is seen in most of the tribal family with no milk but gud in it. This way the families are consuming atleast a iron substitute but zero milk is again a failure on calcium substitute side. Their affinity towards flesh food is more than anything but bounded to the availability and price makes it to the plate occasionally or monthly basis

There are no special foods reported to be consumed by either of PLAs nor there are any added efforts on their or families part for special physiological condition. Irrespective of doing household chores, agriculture work, labor work, the

quality and quantity of diet is missing rather the foods fads and fallacies prevailing.

In lactating case the women is found to have been consuming a diet consisting of diluted moong daal and two tspn of dalia or rice for two meals a day. This is drastically low energy and nutrient diet and is responsible for adding extra health burdens on women. However the women who participated in the study were counseled. THR provided from AWCs are consumed by whole family in one meal

Similarly, the complimentary feeding of the children are not considered as the integral part of the health rather it is just a put up routine. The children are give away a piece of roti to shed of the time and energies. No special care or treatment is recorded for 6+ months children. In few exceptional cases, families make efforts in providing khichdis and daliyas. The children are limited with cereals and potato or kurkura biscuit which is quite a pattern in the study districts.

As demonstrated in Table 1 of this report, none of the food grain is consumed as per the recommended allowance. The diet that is consumed is not even half of the percent of recommended

21.11. Nutrient Intake Pattern

As the diet is remarkably poor in terms of both quality and quantity the nutrients provided through these diet to either of IPLA group is not upto the standards or recommended allowances. The Table 1 provided the detailed one-go statistical summary of the same which states that none of the nutrients intake matches the RDA. Except for energy and fats content, not even a single nutrient is consumed half the percent of RDA in all the four groups. This further has set the imbalances ground for malnutrition and other infections to seep in.

22. Chapter Twenty- Two – Recommendation

1. Food and Nutrition Intervention:

Many national and bilateral agencies have been focusing on enhancing food-based approaches to overcome nutrition problems since ages. Those have been promoting nutrient supplementation plus food fortification programmes. At any given time the food-based approach has been proven effective cost-driven and easy to deliver. Nevertheless supplying micronutrients, in absence of food, makes no sense at all. Nor the nutrition awareness alone would serve the purpose. Thus, this is where channelizing the local food system becomes crucially significant.

- Sustainable food and nutrition programmes should focus on combination of approaches like elevating the local plant and animal sources rich in micronutrients and pocket friendly so as to be absorbed in the common plate easily.
- Infrastructure that supports community nutrition interventions includes charismatic leadership with decision-making skills, particularly among women, and the existence of poverty reduction programmes.
- Community-level production of small animals, poultry and fish can provide necessary animal foods with absorbable micronutrients, as complementary foods for infants and young children
- Infrastructure that supports community nutrition interventions includes charismatic leadership with decision-making skills, particularly among women, and the existence of poverty reduction programmes.

2. Documentation of basics

Documents that are grounded in knowledge and use of local food it was therefore necessary to ensure community-based knowledge sharing and documentation of local food systems in their full diversity. It is important to understand what people could harvest and purchase locally, what made foods acceptable to different age and gender groups in the community, and what health- giving potential there was for each of these foods. For benefits of future generation even community people are keen to document their knowledge . This would serve as the resource bank to be implicated wherever necessary

3. Capacity Building

Knowing the knows is important for successful implementation of any programme. The major chunk of the community who knows the basics of traditional food chains were reported to be Elderly people. Utilizing this as a

resource would come to rescue when executing any programme.

The second knowledge group identified was women. Any food and nutrition programmes perpetually engage women's contribution, it is imperative to take in and empower women as much as possible, and to endow with tools through which women could be the information carriers in social promotion within communities and with community leaders. One of the way could be SHG promotion and linkages of SHG groups.

The third resource group can be community leaders and mobilizers. These can be trained on i) to manage food security measures such as kitchen gardens or grain banks and to support the access and utilization of related programs such as PDS or MDMS; (ii) to support the adoption of optimal maternal and child care; and (iii) to support SHGs or village organizations to manage the local service delivery of FNS-related schemes, especially MDMS and PDS.

4. Community Gardens

Smaller is better. To begin with community gardens should be taken into consideration and should be incorporated with the available resources on vegetation and plantations. The community gardens are proven strategy for promoting locally available food, where the community themselves initiate and begin with by sharing the products first and later on developing on marketing techniques to deliver it to external world

5. Building Resources

Building resources is the primary and essential requirement. It's therefore imperative to connect with technical agencies to hold up village organizations and SHGs to extend capacity and organize interventions.

6. Seed and grain Banks

While discussion, the villagers stressed on brining back their old traditional crops by providing them seed. It is also observed that loss of crop is primarily due to loss of seeds over a period of time. Thus seed and grain banks should be made and promoted and rurals only can operate and handle these banks in order to pass-on the legacy to the upcoming generations.

7. Working with government

It's important that government should feel and take the ownership of the government. The timely communication to

government regarding the information and knowledge based thus created can help in brining and implement certain programmes. The government can initiate livelihood and local job programmes wherein the community is invoved for the community for instance, if NTFP can be collectively build as market within wvillage where the shares are distributed for profit and losses and works are shared for value addition of the produce, in a collaborative way can bring in the huge economy to community as a whole, rather than household oing it alone. That fund can be raised as corpus for promoting other local and traditional food programmes.

8. Linkages with market

It's important to establish links with local markets and haats and bigger traders by understanding the marketing chain. If this is channelized in a proper way, then also tribals and community members could have been benefitted more as there is a huge exploitation on market levels. For instance, when a villager goes to buy chiraunji, it costs him 900INR per Kgs contrary to 500 INR a kgs when he went to sell it after collecting from forest

9. Promotion of NTFPs

As NTFPs contributed to major economy, it's now become viable to incorporate this as full fledged source of income for these people. The government should make efforts and forest departments should be considered and discussed with the ways and adjustments those could be made both in favor of community and forests

10. Water supply

It is clear that water productivity increases are required in both irrigated and rainfed crops, and in both grain and non-grain crops. Identify high productivity zones and high potential locations for increasing the water productivity of

grain crops Identify suitable cropping patterns, which generate higher value for every drop of water consumed. Encourage and increase crop diversification from grains to non-grains crops in locations where returns to water use is low at present.

Import part of the demand of the certain crops, or increase virtual water trade, where differences of irrigated and rainfed water productivities are high or water productivity under both conditions are low.

11. Food security

On an average an overwhelming majority of the sampled farmers (74.7 %) have low food availability. About 18 % have moderate food availability and only 7.3 % have high food availability. Within farmers' category, most of the large farmers (77 %) have high food availability; most of the medium farmers (65 %) have moderate food availability. All the small and marginal farmers have low food. Several government programs have been running and providing food grains to increase their food availability e.g. Antodaya Ann Yojana, Annapurna Yojana, mid day meal scheme,etc but the analysis has revealed that the condition of small and marginal farmers is still very poor. Hence there is an urgent need of policy intervention to increase the production through improved agricultural techniques and adequate inputs.

12. Focus on IPLAs

The most vulnerable groups taken into the study were Infants, Pregnant and Lactating mothers and Children are at stake in regards to health and nutrition. There is a dire need to improve their health by spread words of nutrition education not only through front line workers by through community leadrs and mobilizers then only the status might get improved

23. Annexures

Annexure –1 : Nutritional Status of Children

Nutritional Status of Children: NFHS 4. Table 23.1 : Nutritional Status of Children 2014-15

Percentage of children under age five years classified as malnourished according to three anthropometric indices of nutritional status: height-for-age, weight-for-height, and weight-for-age, by background characteristics, Madhya Pradesh, 2015-16, and total for NFHS-3			
Particulars	Stunting	Wasting	Underweight
Religion			
Hindu	42.3	26.1	43.2
Muslim	39.6	21.7	39.9
Jain	17.0	15.9	18.7
Other	35.5	28.0	32.8
Caste/tribe			
SC	47.6	25.5	45.9
ST	48.2	30.2	51.5
OBC	39.7	24.9	40.7
Other	31.6	21.5	30.6
MP Urban	37.4	22.0	36.5
MP Rural	43.6	27.1	45.0
MP Total	42.0	25.8	42.8
India	38.4	21.0	35.7

Annexure 2 : Study Tools

Table 23.2 Study Tools

SN	Steps	Data to be collected	Type
1	Gather background data	1 National micronutrient nutrition situation reports; local data if possible	Library Research
		2 Geography and climate of the specific community area	Desk review
		3 Brief history of the Indigenous People in the study, including migration patterns if applicable	Library Research + Desk Review + Literature Review
		4 Current situation of the people a. Village structure in context of the region b. Transportation; communication channels and patterns c. Census/information for the area; general population structure d. Family structure and way of life; recreation; general family resources e. Material culture; housing, clothing, etc. f. Persistence of traditional lifestyle g. Agriculture/livelihood/income, including general cropping patterns h. Hunting, fishing, and gathering wild/uncultivated foods i. Typical education pattern j. Water, sanitation, hygiene k. Political/administrative structure l. NGO's aid programs in the area m. Environmental concerns and protection issues to date	Field Research+Library Research
		5 Food availability a. Major crops, and proportion of these sold or retained for home use b. Food items from gathering, hunting, fishing c. Livestock d. Distance to market areas e. Availability of foods fortified with micronutrients f. Storage facilities in village, regular preservation practices	Field Research+Library Research
		6 Health care a. Customs, including child care practices in the community b. Closest nurses, doctors, hospitals if required c. Immunizations: local campaigns and frequency d. Distribution of nutrient supplements e. Nutrition programs in the area: when, where, degree of success f. Agency programs implemented in the area that promote child health.	Field Research+Library Research
2	Capturing Data on Traditional Food	1 Listing Traditional Food a. Traditional Food Item b. Local name/national language name (English/common name) c. Characteristics and frequency of use	Field Research
		2 Traditional Food Seasonality and Popularity with Children and Women a. Food group listing b. Identifying the children/mother likes c. quantity harvested by the community in a year	Field Research
		3 Community Traditional Food System Data Tables a. Listing the variety of food items b. Frequency of their use c. Nutrients composition/100gms	Field Research
		4 Little-used or currently unused traditional food known by elders a. The food name (and food category). This may be available only in the local name. If there are several varieties, each one to be discussed separately. b. Season available (if there are foods that are only consumed during periods of drought, and if they exist in the local area) c. Place available (this may require a map of the local area) d. A brief description of the food harvest and preparation e. Why the food is used infrequently, or no longer used	Field Research
		5 Short list of expected key micronutrient-rich traditional food for children and adults a. foods with potential to provide good sources of iron, zinc, vitamin A (retinol or carotene), vitamin C and folic acid b. primarily animal foods, leafy vegetables, orange or deep yellow vegetables and fruit c. parts and general preparation style (raw, steaming, roasting) of the animal or plant that are regularly consumed	Field Research
		6 Market survey for purchased food a. determine the price of each food by season, and whether there are affordable and acceptable foods in the market that are consumed by children b. food items are regularly purchased that are consumed by children c. determine where purchased (market or store), the price range, seasons available, and serving size d. List the part of the food species that is being purchased (for example goat liver, or sweet potato leaves or tubers) e. determine the price per unit of each nutrient	Field Research
3	Scientific parameters of traditional food	1 Taxonomic identifications a. Preparation of traditional food list for identifications based on available resources and data and local information	Laboratory Research
		2 Collection of Samples if required a. If taxonomic classification is not done with the available resources, samples to be collected for both plant and animal resources, wherever is applicable	Laboratory Research
		3 Selecting and prioritizing food with missing nutrient data a. Traditional Food System List including seasonality and likes by children and mothers – recheck with a score of 1-3 b. Food System Data Tables –recheck for food items that have missing nutrient data for the key nutrients of this project. c. Identifications by a botanist/zoologist/nutritionist – shed of sample for analysis which has not been scientifically identified. d. If no identification, there is a good chance that there is not any nutrient information	Laboratory Research
		4 Nutrient analysis a. Samples to be cross checked with available nutrient scores by National Institute of Nutrition b. Listing of Nutrients to be done for Micro and Macro nutrients	Laboratory Research

4	Individual interviews for understanding dietary food	1	Selection of individuals for these individual interviews	a. The leaders of the community of Indigenous people are the first source of advice on which families are available and suitable for conducting these interviews. The team will need an appreciation of the general community practices for traditional food harvesting (for example, do mostly all households participate, do only a few households participate, or do a few households supply the whole village?) b. With this information, ideally, a random sample is selected from a community list (or map) of households with pregnant and lactating mothers, infants' mother.. Thirty randomly selected respondents will usually give sufficient qualitative data to represent the community's diversity on food use and cultural values.	Field Research
	Use and nutrient intake patterns, and cultural context in the Community of indigenous people, particularly for infants,	2	Understanding Food Use Patterns and their Cultural Context	a. Card sort exercise to be conducted to pile and stack the food items presented on cards in the group based on color (green foods go together), food species type (animal foods go together, plant foods go together in a separate place), seasonality (wet season foods in one pile, dry season foods in another), "hot" or "cold" characteristics, or "blood building" characteristics. b. Using a short-list of various micronutrient rich foods contained in the food system helps in understanding how and why certain foods have cultural definitions, and this information will be useful in planning a food-based nutrition promotion program.	Field Research
	Children, mothers and elders	3	Taste appreciation of expected key micronutrient rich foods by children and adults	a. One of the most important qualities driving food choice and acceptability is taste b. The mother will likely be able to respond with a score of 1-5 for the young child as well as for herself to complete the tool related to this question. Alternatively, others may be able to score their own taste scores for each food. When each food contains a score, the short-list of micronutrient rich foods can be ranked.	Field Research
		4	Focus on micronutrient-rich complementary foods for infants	a. Each of the short-listed micronutrient rich traditional foods can be questioned for their particular attributes for introduction to infants. b. community practices for complementary feeding c. Probes can be "How would you describe this food as being suitable for infants?", and "When would be a good time to start giving this food?"	Field Research
		5	Infant food history	a. Infant food history can be recorded using questionnaire regarding introduction of complementary food and breastfeeding practices and if altered by any prelacteal food b. In this procedure the mother about a particular young child in her care is being asked about the kind and duration of milk feeding as well as complementary foods.	Field Research
		6	24-hour recalls for Pregnant and lactating mothers and Adolescents	a. Two 24-hour recalls during the same week (but not consecutively) for the same individual should be taken to estimate usual dietary intake. b. The overall objective of dietary evaluations is to understand food use, as much as is possible, on a year-round basis; to understand the amount of micronutrients consumed; to understand the proportion of traditional food of the Indigenous community used in contrast to purchased food; and if necessary, to provide a baseline of dietary intake against which a comparison can be made following a food-based dietary intervention. c. Two interview tools are used for this procedure: the 24-hour recall, described above, and the traditional food frequency interview.	Field Research
	5	1	Computing nutrient intakes	a. Based on the collected information, the nutrient intake per day per person in grams is calculated	Laboratory Research
		2	Matching RDA	a. Nutrient intake with recommended dietary allowances as proposed by ICMR are checked b. Difference of nutrients are listed	Laboratory Research
		3	Proposing the alternate options from the food listed	a. Analyzing the difference of nutrients from the current diet and traditional foods b. Mix matching the traditional food list with the diet to emphasize the nutrient intake c. Possible combination of recipes within the resources	Laboratory Research

Annexure-3 : Basic Profile of Study Area

Table 23.3 : Basic profile of study area

Districts	District Code	Village Name	Village Code	Block and District	Name of the Panchayats	FGDs	Households @25 per village	Key Informants	Adolescents	Pregnant Mothers	Lactating Mothers	Young Child 6 months to 2 years	Total Sample HHs+IPLA
Niwadi	01	Kaina	0101	Niwadi	Kaina	1	25	5	5	5	5	5	50
Niwadi	01	Pojanpura	0102	Niwadi	Bihayipura	1	25	5	5	5	5	5	50
Panna	02	Kudar	0201	Panna	Khajri	1	25	5	5	5	5	5	50
Panna	02	Kotagunjapur	0202	Panna	Jardhova	1	25	5	5	5	5	5	50
Rewa	03	Obri	0301	Jawa	Baunsar	1	25	5	5	5	5	5	50
Rewa	03	Gadhwai	0302	Jawa	Sohawal Khurd	1	25	5	5	5	5	5	50
Satna	04	Devlahya	0401	Majhgava	Devlahya	1	25	5	5	5	5	5	50
Satna	04	Khairwar	0402	Majhgava	Bhathwa	1	25	5	5	5	5	5	50
Umaria	05	Mardari	0501	Karteli	Birhuliya	1	25	5	5	5	5	5	50
Umaria	05	Amdi	0502	Karteli	Amdi	1	25	5	5	5	5	5	50
Total						10	250	50	50	50	50	50	500

Annexure-4 : List of Patients spotted

Table 23.4 : Lists of patients spotted

Districts	Name of Patient	Age	Gender	Marital status	Type of Illness*	Duration after which treatment started	Name of diseases
Niwari	Niraj	16	1	2	5	1	Fever with chills
Panna	Neelam	27	2	1	8	0	Only fever
Panna	Neelam	27	2	1	8	0	Only fever
Panna	Neelam	27	2	1	8	0	Only fever
Panna	Neelam	27	2	1	8	0	Only fever
Panna	Neelam	27	2	1	8	0	Only fever
Rewa	TANUJ GAIL	11	1	2	1	10	Diarrhoea
Rewa	MANSI	29	2	6	6	15	Diarrhoea
Rewa	SAP0	13	2	2	2	20	Dysentery
Rewa	SAP0	13	2	2	2	20	Diarrhoea
Rewa	KARE0 DEVI	3	2	2	4	10	Jaundice
Rewa	PREETI	15	2	2	4	4	Jaundice
Rewa	SANGEETA	20	2	2	4	15	Fever with chills
Rewa	PRINCE KUMAR	7	1	2	4	12	Fever with chills
Rewa	RANVEER	18	1	2	4	4	Fever with chills
Rewa	RANVEER	18	1	2	4	4	Fever with chills
Rewa	SEEMA DEVI	4	2	2	6	15	Fever with rashes
Rewa	RUPA	13	2	2	6	15	Fever with rashes
Rewa	RAMSUMER	40	1	1	6	10	Fever with rashes
Rewa	ASHISH	2	1	2	6	5	Fever with rashes
Rewa	PANSO	7	2	2	8	3	Only fever
Rewa	TANUJ GAIL	11	1	2	6	10	Only fever
Rewa	ANURADHA	6	2	2	7	4	Only fever
Rewa	SAP0	13	2	2	6	15	Only fever
Rewa	PUSHPENDRA	4	2	2	6	15	Only fever
Rewa	PUSHPENDRA	4	2	2	6	15	Only fever
Rewa	PUSHPENDRA	4	2	2	6	15	Only fever
Rewa	MANJU	1	2	2	7	10	Only fever
Rewa	SUMAN	29	2	1	7	15	Only fever
Rewa	MAMTA DEVI	29	2	2	7	10	Only fever
Satna	ARJUN OWASI	45	1	1	6	8	Only fever
Satna	SHANTI	21	2	2	6	5	Only fever
Satna	RAJKUMAR MAWASI	22	1	1	6	5	Only fever
Satna	LAKHAN MAWASI	55	1	1	6	10	Only fever
Satna	PREMWATI	55	2	1	6	2	Only fever
Satna	VISHWAKARMA						
Satna	PAWAN YADAV	15	1	2	6	5	Only fever
Satna	NEETA	25	2	2	6	10	Only fever
Satna	ROSHN15	15	2	2	6	5	Only fever
Satna	SANJAT KHAIRWAR	3	1	2	6	5	Only fever
Satna	JHURRI BAI KHAIRWAR	55	2	1	7	5	Only fever
Satna	PAVITRA KUMAR	4	1	2	7	5	Only fever
Satna	BABLI	25	2	1	7	4	Only fever
Satna	URMILA	37	2	1	7	5	Only fever
Satna	HANUMAN SINGH	58	1	1	7	3	Only fever
Satna	RANI SINGH	5	2	2	7	5	Only fever
Satna	CHOTU	5	1	2	7	3	Only fever

Umaria	BHURA BAIGA	46	1	1	1	7	Diarrhea
Umaria	GUDDI BAI	40	2	1	1	15	Diarrhea
Umaria	MEGHOND YADAV	36	1	1	2	10	Dysentry
Umaria	MEGHOND YADAV	36	1	1	2	10	Dysentry
Umaria	BABLI BAIGA	29	2	1	2	15	Dysentry
Umaria	MURATLAL YADAV	38	1	1	2	20	Dysentry
Umaria	GOLU BAIGA	30	1	1	3	15	ARF
Umaria	RAJKUMAR	7	1	2	3	10	ARF
Umaria	TULSI SINGH	18	2	2	3	5	ARF
Umaria	KOMAL SINGH	40	1	1	4	10	Juandice
Umaria	SONIYA BAI	62	2	4	4	7	Juandice
Umaria	RAISEN SINGH	66	1	1	4	15	Juandice
Umaria	KISHAN YADAV	21	1	2	5	10	Fever with chills
Umaria	MUNNI BAI	40	2	1	6	7	Fever with rashes
Umaria	USHA SINGH	18	2	2	6	7	Fever with rashes
Umaria	ANSURYAN YADAV	14	2	2	6	2	Fever with rashes
Umaria	VINOD SINGH	20	1	2	8	15	Only fever
Umaria	BALI RAM BAIGA	34	1	1	7	2	Only fever

Annexure-5 - Dosages of IFA

Age group	Intervention/ Dose	Regime	Service delivery
6–60 months	1ml of IFA syrup containing 20 mg of elemental iron and 100 mcg of folic acid	Biweekly throughout the period 6–60 months of age and de-worming for children 12 months and above.	Inclusion in MCP card Through ASHA/ ANM
5–10 years	Tablets of 45 mg elemental iron and 400 mcg of folic acid	Weekly throughout the period 5–10 years of age and biannual de-worming	In school through teachers and for out- of school children through Anganwadi centre (AWC)
10–19 years	100 mg elemental iron and 500 mcg of folic acid	Weekly throughout the period 10–19 years of age and biannual de-worming	In school through teachers and for those out-of- school through AWC
Pregnant and lactating women	100 mg elemental iron and 500 mcg of folic acid	1 tablet daily for 100 days, starting after the first trimester, at 14–16 weeks of gestation. To be repeated for 100 days post-partum.	ANC/ ANM /ASHA Inclusion in MCP card
Women in reproductive age (WRA) group	100 mg elemental iron and 500 mcg of folic acid	Weekly throughout the reproductive period	Through FHW during house visit for contraceptive distribution
Source : : Ministry of Health and Family Welfare			

Annexure-6: Grades of Undernutritons as identified

List of infants/children sampled (n=100) with grades for W/A ; H/A and W/H

SN	District	Respondent's name		Age	Gender 1-F ; 2-M	Age group in months	Weight	Height	W/A:	H/A	W/H:
1	Niwadi	Anita	Pal	0.19	2	below 1	3.9	51	Normal	Normal	normal
2	Niwadi	Preeti	Pal	1	1	1-6 Mo	4	49	Normal	Normal	orange
3	Niwadi	Pragya	Sour	1	1	1-6 Mo	5.6	55.8	Normal	Normal	normal
4	Niwadi	Urmila	Sour	1	2	1-6 Mo	4.6	34.9	normal	severe	severe
5	Niwadi	Uma	Kushwaha	2	2	1-6 Mo	5.3	62	Normal	moderate	normal
6	Niwadi	Kamla	Pal	4	1	1-6 Mo	5.2	61	Normal	moderate	normal
7	Niwadi	Sandhya	Vishwkarma	4	2	1-6 Mo	5.2	65	Normal	severe	normal
8	Niwadi	Chhaya	Sour	5	1	1-6 Mo	6.2	49	Normal	Normal	severe
9	Niwadi	kiran	Kushwaha	5	2	1-6 Mo	6.3	63	Normal	Normal	moderate
10	Niwadi	Rajni	Kushwaha	7	2	7-12 Mo	7.2	69	Normal	moderate	normal
11	Niwadi	Urmila	Kushwaha	8	1	7-12 Mo	8	70	Normal	Normal	Normal
12	Niwadi	Krishna	Kushwaha	9	1	7-12 Mo	7.3	71	Normal	Moderate	Normal
13	Niwadi	Ramshri	Saur	9	1	7-12 Mo	7	65	Normal	Normal	severe
14	Niwadi	Janki	Saur	9	1	7-12 Mo	8.9	70	Normal	Normal	Normal
15	Niwadi	Seema	Pal	9	1	7-12 Mo	8.1	72	Normal	Normal	Normal
16	Niwadi	Ramsakhi	Saur	12	2	7-12 Mo	8.5	72	Normal	Normal	Normal
17	Niwadi	Vati	Aadiwasi	17	2	13-18 Mo	8.2	69	Normal	Normal	severe
18	Niwadi	Phoola	Kushwaha	23	2	19-24 Mo	8.3	77	Moderate	Moderate	severe
19	Niwadi	Premvati	Kushwaha	24	2	19-24 Mo	7.9	77	severe	severe	severe
20	Niwadi	Tara	Kushwaha	22	1	19-24 Mo	8.8	78	Moderate	Normal	Moderate
21	Panna	Neelam	Yadav	1.5	1	1-6 Mo	2.6	56	moderate	severe	normal
22	Panna	Gori Bai	Gond	4	2	1-6 Mo	3	57	severe	severe	severe
23	Panna	Pooja	Vishwakarma	3	1	1-6 Mo	2.9	57	severe	severe	severe
24	Panna	Anu	Yadav	1	2	1-6 Mo	8	69	Normal	Normal	normal
25	Panna	Brijrani	Gond	1	1	1-6 Mo	7.2	68	Normal	Normal	normal
26	Panna	Rekha	Gond	2	2	1-6 Mo	4.5	51	Normal	Normal	severe
27	Panna	Sushila	Gond	3	2	1-6 Mo	5.2	52	normal	normal	severe
28	Panna	Rukmani Bai	Gond	8	1	7-12 Mo	6.6	55	Normal	Normal	severe
29	Panna	Vidya	Gond	8	1	7-12 Mo	6.4	53	Normal	Normal	severe
30	Panna	Radha	Gond	9	1	7-12 Mo	7.2	58	Normal	Normal	severe
31	Panna	Anu	Yadav	9	1	7-12 Mo	7.3	69	Normal	Moderate	Moderate
32	Panna	Phoolkumari	GOND	12	2	7-12 Mo	7.6	69	Normal	Normal	Normal
33	Panna	Sonam	Yadav	18	1	13-18 Mo	9.3	74	Normal	Normal	severe
34	Panna	Sushila	Gaur	24	1	19-24 Mo	10.3	81.5	normal	normal	Normal
35	Panna	Vinda	Bai	24	1	19-24 Mo	11.3	74	Normal	Normal	severe
36	Panna	Tulsa	Bai	24	2	19-24 Mo	9.4	74	Normal	Normal	severe
37	Panna	Laxmi	Gond	11	1	7-12 Mo	5.7	62	severe	Moderate	severe
38	Panna	Gaura Bai	Gond	7	1	7-12 Mo	3.7	58	severe	moderate	severe
39	Panna	Phula	Bai	24	1	19-24 Mo	8.9	72	Moderate	Normal	severe
40	Panna	Gaura Bai	Gond	24	2	19-24 Mo	8.9	74	Moderate	Moderate	severe
41	Rewa	Seema	Khairwar	1	2	1-6 Mo	2.6	53.8	moderate	severe	normal
42	Rewa	Shyamvati	Khairwar	2.5	1	1-6 Mo	3.6	58.1	severe	severe	normal
43	Rewa	Savita devi	Kol	1	2	1-6 Mo	3.5	54	Normal	moderate	normal
44	Rewa	Rani	Kol	2	1	1-6 Mo	4.3	56.5	Normal	moderate	normal
45	Rewa	Maya	Khairwar	3	2	1-6 Mo	4.4	58.9	Normal	severe	moderate
46	Rewa	Sangeeta	Khairwar	3.1	2	1-6 Mo	4.5	59.6	Normal	severe	normal
47	Rewa	Ramvati	Kol	4	2	1-6 Mo	6.1	61.4	Normal	Normal	moderate
48	Rewa	Sunita	Khairwar	5	1	1-6 Mo	5.7	63.2	Normal	moderate	normal
49	Rewa	Shashi	Kol	5	1	1-6 Mo	5.5	63.4	Normal	moderate	normal
50	Rewa	Rajkumari	Kol	5	1	1-6 Mo	5	63.4	Normal	moderate	normal
51	Rewa	Gudiya	Gond	9	2	7-12 Mo	5.7	62	Normal	Normal	severe
52	Rewa	Ranidevi	Kol	9	1	7-12 Mo	7.6	69	Normal	Normal	severe
53	Rewa	Saroj	Khairwar	11	2	7-12 Mo	6.9	66	Normal	Normal	orange
54	Rewa	Anu	Yadav	11	1	7-12 Mo	6.7	67	Normal	Moderate	severe
55	Rewa	Prabha	Yadav	12	2	7-12 Mo	9.1	71	Normal	Normal	Moderate
56	Rewa	Urmila	kol	13	2	13-18 Mo	9.3	74	Normal	Normal	Normal
57	Rewa	Archana	Kol	13	2	13-18 Mo	10	73	Normal	Normal	Normal
58	Rewa	Preeti	Mishra	23	1	19-24 Mo	12.5	76	Normal	Normal	severe
59	Rewa	Anisha	Kol	13	1	13-18 Mo	6.7	65	Moderate	Moderate	severe
60	Rewa	Geeta	Kol	18	1	13-18 Mo	7.8	71	Moderate	Moderate	severe
61	Satna	Neetu	Mawasi	0.16	2	below 1	3.4	59	Normal	severe	normal
62	Satna	Roshni	Mawasi	1	2	1-6 Mo	3.5	59	Normal	severe	normal

63	Satna	Belkali	Mawasi	1	1	1-6 Mo	6	64	Normal	Normal	normal
64	Satna	Gendabai	Mawasi	2	2	1-6 Mo	3.7	60	Normal	severe	normal
65	Satna	Richa	Khairwar	2.5	2	1-6 Mo	6.7	67	Normal	moderate	normal
66	Satna	Sumitra	Mawasi	4	2	1-6 Mo	6.6	60	Normal	Normal	Normal
67	Satna	Sumitra	Mawasi	4	1	1-6 Mo	5.5	64	Normal	moderate	normal
68	Satna	Rukmani Bai	Khairwar	4	1	1-6 Mo	5.1	61	Normal	moderate	normal
69	Satna	Poonam devi	Khairwar	4	1	1-6 Mo	5.1	61	Normal	moderate	normal
70	Satna	Sunila	Mawasi	12	2	7-12 Mo	5.9	64	severe	Moderate	severe
71	Satna	Neeta	Mawasi	12	1	7-12 Mo	6.5	68	Moderate	Moderate	severe
72	Satna	Sonia	Khairwar	5	2	1-6 Mo	6.3	65	Normal	moderate	normal
73	Satna	Gori Bai	Khairwar	5	1	1-6 Mo	5.7	65	Normal	severe	normal
74	Satna	Keshkali	Khairwar	10	2	7-12 Mo	6	65	Normal	Moderate	orange
75	Satna	Buaniya	Mawasi	12	2	7-12 Mo	7.4	70	Normal	Moderate	Moderate
76	Satna	Meena	Khairwar	12	2	7-12 Mo	7	68.5	Normal	Normal	orange
77	Satna	Lalli	Khairwar	18	2	13-18 Mo	9.1	76.5	Normal	Normal	Moderate
78	Satna	Kusumi	Khairwar	23	2	19-24 Mo	8.9	76.7	Normal	Moderate	Normal
79	Satna	Usha	Mawasi	13	1	13-18 Mo	6.2	67	Moderate	Moderate	severe
80	Satna	Shanti	Khairwar	24	2	19-24 Mo	8.4	77	Moderate	Moderate	orange
81	Umaria	Sangeeta Bai	Baiga	6	2	1-6 Mo	4.6	64	moderate	severe	orange
82	Umaria	Anita	Baiga	0.8	2	below 1	2.3	46	Normal	Normal	orange
83	Umaria	Seema	Yadav	1	1	1-6 Mo	3.3	46.5	Normal	Normal	severe
84	Umaria	Rekha Singh	Gond	1	2	1-6 Mo	3.2	54	Normal	moderate	normal
85	Umaria	Kelabai	Singh Gaur	2	2	1-6 Mo	9.2	80	Normal	Moderate	Normal
86	Umaria	Saraswati	Gond	3	1	1-6 Mo	5.2	60	Normal	Normal	normal
87	Umaria	Pooja	Yadav	18	2	13-18 Mo	7.9	75	Moderate	Moderate	orange
88	Umaria	Sumrila	Yadav	18	2	13-18 Mo	4.3	71.5	severe	severe	severe
89	Umaria	Roshni	Yadav	18	2	13-18 Mo	5.4	73	severe	severe	orange
90	Umaria	Phool Bai	Baiga	4	1	1-6 Mo	5	58	Normal	Normal	orange
91	Umaria	AsmitSingh	Gond	18	2	13-18 Mo	4.5	56	severe	Normal	severe
92	Umaria	Gamla Singh	Gond	5	1	1-6 Mo	6	58	Normal	Normal	orange
93	Umaria	Aarti	Yadav	6	1	1-6 Mo	8.3	68	Normal	Normal	normal
94	Umaria	Shakuntala	Gond	6	1	1-6 Mo	5.6	61	Normal	moderate	orange
95	Umaria	Shakuntala	bai	9	2	7-12 Mo	6	68	Normal	severe	Moderate
96	Umaria	Chanda Bai	Baiga	15	2	13-18 Mo	8	73	Normal	Normal	Moderate
97	Umaria	Phool Bai	Singh Gaur	23	2	19-24 Mo	9.6	79	Normal	Normal	orange
98	Umaria	Meena	Baiga	23	2	19-24 Mo	8.2	72	Normal	Normal	severe
99	Umaria	Maya	Baiga	23	2	19-24 Mo	8.7	74	Normal	Moderate	severe
100	Umaria	Pooja	Mahabir	23	2	19-24 Mo	9	79	Normal	Normal	orange

Annexure-7 : List of respondents who have very low BMI

SN	District	Name of Respondent		Social Status 1. SC 2. ST 3. OBC 4. Others	Caste	Category	Height in Cms	Weight In KGs	BMI
		First Name	Last Name			Pregnant 1 Lactating 2 Adolescent 3			
1	Panna	Savita devi	Kondar	2	Kondar	1	149	31.4	14.144
2	Umaria	Priyanka	Baiga	2	Baiga	3	140.7	29	14.649
3	Rewa	Suman	Kol	2	Kol	3	150.5	33.5	14.790
4	Umaria	Bhagwati Singh	Gond	2	Gond	3	151	33.8	14.824
5	Umaria	Dropadi	Yadav	3	Yadav	3	146	32.7	15.341
6	Umaria	Shashi Singh	Gond	2	Gond	3	143	31.4	15.355
7	Rewa	Vidhavati	Kol	2	Kol	3	148.5	34.6	15.690
8	Umaria	Savita Singh	Gond	2	Gond	3	143	32.1	15.698
9	Panna	karishm	Gond	2	Gond	3	156	38.7	15.902
10	Satna	Reshma	Mawasi	2	Mawasi	3	159	40.5	16.020
11	Satna	Rukmani Bai	Khairwar	2	Khairwar	2	158	40	16.023
12	Panna	Suman	Gond	2	Gond	3	140	32	16.327
13	Niwadi	Kamla	Pal	1	Pal	2	141	32.5	16.347
14	Satna	Kalmatiya	Khairwar	2	Khairwar	3	140	32.4	16.531
15	Umaria	Saraswati	Gond	2	Gond	2	157	40.8	16.552
16	Niwadi	Muskan	Kushwaha	3	Kushwaha	3	143	33.9	16.578
17	Niwadi	Mohini	Kushwaha	3	Kushwaha	3	143	33.9	16.578
18	Umaria	Pinky	Yadav	3	Yadav	3	150	37.7	16.756
19	Panna	Anu	Yadav	3	Yadav	2	69	8	16.803
20	Umaria	Shakuntala	Gond	2	Gond	2	150	37.9	16.844
21	Satna	Rohini	Khairwar	2	Khairwar	1	145	35.6	16.932
22	Rewa	Rajkumari	Kol	2	Kol	2	152	39.8	17.226
23	Umaria	Aarti	Yadav	2	Baiga	2	151	39.3	17.236
24	Umaria	Gomti	Baiga	2	Baiga	3	145	36.4	17.313
25	Umaria	Poonam Singh	Gond	2	Gond	1	151	39.9	17.499
26	Rewa	Shashi	Kol	2	Kol	2	149	39.1	17.612
27	Satna	Poonam	Khairwar	2	Khairwar	3	145	37.2	17.693
28	Rewa	Usha	Khairwar	2	Khairwar	3	146.3	37.9	17.707
29	Panna	Shivrati	Gond	2	Gond	1	154	42	17.710
30	Rewa	Aarti	Yadav	3	Yadav	3	147.8	38.7	17.716
31	Rewa	Butan	Khairwar	2	Khairwar	3	143.2	36.4	17.751
32	Niwadi	Rajni	Kushwaha	3	kushwaha	2	153	41.6	17.771
33	Niwadi	Chhaya	Sour	2	Sour	2	161.5	46.4	17.790
34	Panna	Poonam	Gond	2	Gond	3	144	36.9	17.795
35	Rewa	Savita devi	Kol	2	Kol	2	150	40.1	17.822
36	Niwadi	Sangeeta	Kushwaha	3	Kushwaha	1	157	44	17.851
37	Niwadi	Urmila	Sour	2	Sour	2	146.5	38.5	17.938
38	Panna	Phoola	Gond	2	Gond	3	143	36.7	17.947
39	Umaria	Sarita	Gond	2	Gond	3	149	39.9	17.972
40	Satna	Poonam devi	Khairwar	2	Khairwar	2	161	46.6	17.978
41	Niwadi	Rani	Kushwaha	3	Kushwaha	1	151	41	17.982
42	Satna	Sahodra	Mawasi	2	Mawasi	3	144	37.4	18.036
43	Umaria	Sandhya	Gond	2	Gond	3	152.5	42.1	18.103
44	Niwadi	Manisha	Pal	1	Pal	3	151.5	42	18.299
45	Panna	Brijrani	Gond	2	Aadiwasi	2	154	43.4	18.300
46	Niwadi	Chakno	Kushwaha	3	Kushwaha	3	144	38	18.326
47	Niwadi	kiran	Kushwaha	3	kushwaha	2	150	41.3	18.356
48	Rewa	Kanchan	Khairwar	2	Khairwar	3	147	39.8	18.418
49	Rewa	Poonam devi	Kol	2	Kol	1	146	39.3	18.437
50	Satna	Sonia	Khairwar	2	Khairwar	2	153.7	43.7	18.498

Traditional Food Name/ Item.	Scientific characteristics
Gilchi	Antibacterial, Antifungal, MIC, Antioxidant
Safed Musli	It is used in traditional systems of medicine including Ayurveda, Unani, and homeopathy. It is traditionally used for arthritis, cancer, diabetes, boosting vitality, improving sexual performance, and for many other uses.
Bondi	1 Agaricus mushroom is used for cancer, type 2 diabetes, high cholesterol, "hardening of the arteries" (arteriosclerosis), ongoing liver disease, bloodstream disorders, and digestive problems. Other uses include prevention of heart disease, weakened bones (osteoporosis), and stomach ulcers.
Ghui	1 Ficus auriculata (Roxburgh fig) is a type of fig tree seen all over Asia noted for its big and round leaves. 2.This is used as fodder in Nepal. It is least resistant to fire, but likes good sunlight.
Chachinda	1 The plant is rich in flavonoids, carotenoids and phenolic compounds. Trichosanthes cucumerina has a promising place in the Ayurvedic and Siddha system of medicine due to its various medicinal values like antidiabetic, hepatoprotective, cytotoxic, anti-inflammatory, larvicidal effects.
Kachariya	1. "Foods that are high in antioxidants allow your body to function optimally. Antioxidants help prevent damage and cancer. 2. Cucumbers contain several antioxidants, including vitamin C, beta-carotene and manganese, as well as flavonoids, triterpenes and lignans that have anti-inflammatory properties
Curry Neem, Chirota	1. 1. Weight loss. 2. It can help in treating dysentery, constipation and diarrhea. ...3. Relieves morning sickness and nausea. ...4. Eliminates bacteria. ...5. Good for diabetics. ...6. Good for eyesight. ...7. Reduce stress. ..8. Heals wounds, burns and skin eruptions.
Midnight Creeper	1. a good source of energy and micronutrients. 2. It possesses zinc, phosphorous, magnesium, and calcium along with protein, fat, and carbohydrate. It has the highest amount of energy content
Ghuguchi	1. It is traditionally used to treat tetanus, and to prevent rabies. 2. The plant is used in some traditional medicine to treat scratches and sores and wounds and are also used with other ingredients to treat leucoderma
Chamni, Chandeni, Channa, Chilhati, Chinga, Chingadha, Drai, Garhni, Gohariya, Gulhun, Khadayya, Chalia, Dedka, Katua, Kechuhi, Jheenga, Magur, Chamrai, Chorai	1. Along with heart-healthy fat, fishes also are a great source of high quality protein. Fishes contain 'heme' iron, which is a readily absorbable by our bodies. 3. They also contain thiamine, niacin, vitamin B6, vitamin B12 and vitamin D along with calcium.
Ban Bhindi	1. Amaranthus viridis is used as traditional medicine in treatment of fever, pain, asthma, diabetes, dysentery, urinary disorders, liver disorders, eye disorders and venereal diseases. The plant also possess anti-microbial properties. 1. Ambrette is used for stomach and intestinal disorders with cramps, loss of appetite, and stomach cancer. It is also used for headaches, muscle spasms, hysteria, gonorrhea, and lung problems. Some people use it as a stimulant. 2. It has also been used to treat snakebites.
Khargosh	1. An excellent source of vitamins, minerals and trace elements: High in vitamins B3 and B12, phosphorus, potassium and selenium. 2. It contributes to a good balance of vitamins and minerals for daily dietary requirements. 3. A meat with an excellent balance of fatty acids (rabbit is richer in omega 3 than chicken* or pork
Neem Ka Phal	1. Anti biotic property 2. Rich source of antioxidants
Papita	1. Antiallergic properties and Boosts Immune System 2. Protects Liver and Supports its functioning 3. Anti-diabetic effect 4. Supports Digestive System 5. Prevents Hypertension and Supports Heart Health 6. Cures Eczema and Skin Problems 7. Prevents and cures Respiratory Disorders
Sarso, Rajmukod	1. Antidiabetic activity. ... 2. Antitumor activity. ...3. Analgesic and Anti-inflammatory activities. ...4. Antidiarrheal activity. ...5. Hypolipidemic activity. ...6. Antihepatotoxic effects. ...7. Diuretic and laxative activities.
Kathjamun	1. Antidiabetic 2. Lower blood sugar
Banmungiya	1. Anti-diabetic, anti-cancer, anti-hyperlipidemic, anti-inflammatory and anti-hypertensive properties.
Phang, Poi	1. Anti-inflammatory. 2. The plant is also reported for its ethnomedicinal uses in treating cough, headache, skin disease, malaria etc, as well as treating external conditions such as burns, piles and to relieve pain properties
Nonia	1. Anti-inflammatory properties
Baseeda	1. Antioxidants. ... 2. Antisteroids. ..3. Antipyretic Activity. ...4. Antiviral Activity. ...5. Immunity. ...6. Anti-Inflammatory Activity. .7. Diabetes and Complications. ...8. Treatment for Erectile Dysfunction.
Kaitha	1. Antioxidant 2. Antibiotic 3. anti inflammatory
Bel	1. Bael (Aegle marmelos (L.) Corr.) is an important medicinal plant of India. Leaves, fruits, stem and roots of A. marmelos have been used in ethno medicine to exploit its' medicinal properties including astringent, antidiarrheal antidyenteric, demulcent, antipyretic and anti-inflammatory activities
Bajra	1. Bajra is rich in magnesium, which helps keep the heart healthy. 2. It has potassium, which dilates blood vessels, allowing blood to flow more easily. T 3. his helps reduce overall blood pressure.4. Bajra also has fibre that helps reduce LDL, or bad, cholesterol.
Methi	1. Balance cholesterol.2. Soothe upset stomach and digestive problems.3. Reduce menstrual cramps.4. Reduce appetite.5. Reduce fat mass.

	6. Maintain liver and kidney health.7. Soothe muscle pain.8. Reduce fever.
Kekda	1. Better Bones. Crab meat is high in phosphorous, which is an important mineral to the growth of bones and teeth. ... 2. Heart Health. Speaking of omega-3 fatty acids, they are great for balancing cholesterol levels and promoting anti-inflammatory activity in the body. ...3. Increased Immunity. ...4. Detoxing Your Body. ...5. Increased Circulation.
Patherchatta	1. It is an herb found in Ayurveda and other traditional medicines. 2. Historically, Boerhaavia diffusa has been used for its anti-diabetic and diuretic properties. 3. In different areas of the world, Boerhaavia diffusa has also been used for pain relief, anti-inflammation, and treating indigestion
Gobhi	1. Brassicas contain high levels of vitamin C, A, E, K, as well as folate, calcium, iron, potassium and phosphorus. 2. They are a good source of dietary fibre and have something that no other fruits or vegetables contain, namely glucosinolates.
Ban Angur	1. Cissus vitiginea L. is a perennial climber with potent medicinal values and used in Indian traditional systems of medicines to cure wounds, diabetes, cardiovascular illness, cancers, particularly bone diseases and arthritis.
Desi Murgi	1. Country chickens possess fewer toxins from free foraging, meaning little to no health risks, as opposed to broiler chickens, which, according to “Consumer Reports,” are injected hormones and additives that are known to increase the risk of cancer and early onset of puberty
Khajoor	1. Dates are a source of antioxidants. All dates, fresh or dried, contain different types of antioxidants. ...2. Dates can be good for blood sugar balance. ...3. Dates can help reduce blood pressure. ...4. Dates contain a brain booster. ...5. Dates help maintain bone mass.
Barasingha, Cheetal, Chinkara, Hiran, Sambhar, Bilaikand, Ratalu, Gainthi	1. Deer velvet covers the growing bone and cartilage that develops into deer antlers. People use deer velvet as medicine for a wide range of health problems. 2. Deer velvet is used to boost strength and endurance, improve the way the immune system works, counter the effects of stress, and promote rapid recovery from illness. 1. Dioscorea alata is one such edible species which has the highest yield among all Dioscorea species and can be stored for relatively longer period. 2. It is a rich source of phytochemical such as flavonoids, phenolics, alkaloids, saponin etc. and is also rich in vitamin and mineral contents
Seetaphal	1. Energy dense fruit. 2. Rich source of complex carbs
Khirni	1. Folate and iron prevent anaemia. Sapota helps in strengthening the intestines and in improving their performance. 2. In helps in body resistance against many infectious diseases.
Makor	1. Fruits are spherical or obovoid drupes, black, shining, seeds woody. 2. Medicinal uses: The roots are astringent bitter, anthelmintic, digestive and antiseptic. They are useful in hyperacidity, ascariis infection, stomachalgia and healing of wounds
Bakra	1. Goat meat is full of potassium which helps lower the risk of stroke, high blood pressure, heart and kidney disorders. The B12 in goat helps to lower stress and depression. Goat meat also has Omega 3 and Calcium which is good for strengthening bones
Ramtila, Til, Sarson,	1. Good Source of MUFA. "Mustard oil is highly recommended for the reason that it is full of monounsaturated fatty acids. ...2. Promotes Heart Health. ...3. Treats Cracked Heels and Brittle Nails. ...4. Protects Against Infection. ...5. Helps Blood Circulation. ...6. Good for Skin. ... 7. Relief from Cough and Cold. ...8. Promotes Hair Growth.
Suar Kanda	1. Great source of complex carbohydrates
Peas	1. Green peas contain a decent amount of heart-healthy minerals, such as magnesium, potassium and calcium. 2. Diets high in these nutrients may be helpful for preventing high blood pressure, which is a major risk factor for heart disease 3. They may also have a positive effect on heart health 4. Green peas are rich in fiber, which benefits digestion by maintaining the flow of waste through your digestive tract and keeping gut bacteria healthy
Gursakri	1. Grewia hirsuta medicinal properties: Rasa (taste) – Madhura – sweet, Kashaya – astringent. Guna (qualities) – Guru (heaviness), Picchila (slimy), Snigdha – unctuous, oily. ... Effect on Tridosha – Balances Vata and Pitta Dosha. Prabhava – Rasayana – anti ageing, causes cell and tissue rejuvenation.
Karela Karelia	1. Helps in maintaining blood sugar levels. 2. Lowers bad cholesterol levels. 3. For glowing skin and lustrous hair. ...4. Cures hangovers and cleanses the liver. ...5. Helps in weight loss. ...6. Boosts your immune system. ...7. Great for your eyes.
Arhar	1. Helps Maintain Blood Pressure. 2. Arhar dal is rich in potassium content; potassium is known to act as a vasodilator, which assists in reducing blood pressure and blood constriction. 3. May Promote Weight Loss. 4. Boosts Digestive Health.
Masoor	1. Helps Stabilise Blood Sugar Level. 2. Keeps The Heart Healthy by Lowering Cholesterol. 3. Effective Remedy Against Weight Loss. 4. Anti-Ageing Properties. 5. Nourishes Teeth and Bones. 6. Helpful In Maintaining A Healthy Vision. 7. Beneficial For A Glowing And Radiating Skin.
Sanwa	1. High in fibre. 2. Good source of zinc and manganese. • 3. Helps to maintain body temperature. • 4. Rich Anti - Oxidant. • 5. High in Carbohydrate. 6. It is a fair source of protein 7. highly digestible and is an 8. excellent source of dietary fibre with good amounts of soluble and insoluble fractions
Kusma, Manja, Mirgal, Bam, Marahu, Rusi, Padhin, Rohu, Wheat	1. High in important nutrients. ...2. May lower your risk of heart attacks and strokes. 3. Contain nutrients that are crucial during development. 4. May boost brain health. 5. May help prevent and treat depression. 6. A good dietary source of vitamin D7. May reduce your risk of autoimmune diseases. 8. May help prevent asthma in children.
Dokia	1. High in nutrients and fiber 2. Lower risk of heart disease 3. Lower risk of stroke 4. Reduce risk of obesity 5. Lower risk of type 2 diabetes 6. Support healthy digestion 7. Reduce chronic inflammation 8. May reduce risk of cancer 9. Linked to a reduced risk of premature death
Kaddu, Mukhadha	1. High nutritional value of pigeon, only rare delicacies, but also a high tonic. 2. Pigeon as a high protein, low fat food, protein content of 24.47%, more than rabbits
Urad	1. Highly Nutritious and Particularly Rich in Vitamin A. ... 2. High Antioxidant Content May Reduce Your Risk of Chronic Diseases. ...3. Packs Vitamins That May Boost Immunity. ... 4. Vitamin A, Lutein and Zeaxanthin May Protect Your Eyesight. ...5. Nutrient Density and Low Calorie Count May Promote Weight Loss
Sugarcane	1. Improves Digestion. Urad dal is rich in fibre, both soluble and insoluble, which is known to improve our digestion. 2. Protects Heart. 3. Boosts Energy. 4. Improves Bone Health. 5. Strengthens Nervous System. 6. Helps Manage Diabetes. 7. Good For Skin And Hair.
	1. Instant Energy Booster 2. Diuretic in Nature 3. Fights Cavities & Bad Breath 4. Remedy for Jaundice 5. Improves Digestion 6. Cures Febrile Disorder 7. helps in fighting various types of cancer such as prostate and breast cancer

Jal Murgi, Jal Murgi, Kabootar, Lava, Mor, Murga, Murgi, Van Murgi, Penhta	1. It is a lean meat with high nutritional value, and eating it regularly will help you stay healthy. 2. Protein supply. It has a very high protein content, which plays a very important role in sustaining our muscles. ... 3. Weight-loss. 4. Healthy bones. 5. Stress reliever. 6. Immunity boost.
Dudhia	1. It assist with fungal infections. 2. It also assist with penis enlargement. 3. It helps with serious skin ailments such as leprosy. 4. It helps with skin ailments such as eczema, boils, and psoriasis. 5. It gets rid of ringworm, tapeworm.
Barbati	1. It boots nervous system 2. Relieve pain 3. Combat jaundice 4. Counters respiratory ailments 5. Counter stomach ailment ascites
Satawar	1. It contains beta-carotene, Vitamin B1 and B2, chlorophyll, riboflavin, protein, phosphorus, thiamine, fiber, iron, and pectin. 2. It is low in calories. 3. It provides an adequate of minerals such as copper, calcium, iron, manganese and magnesium.
Bakaina	1. It has antioxidant properties. Antioxidants help prevent free-radical cell damage. ... 2. It has anti-inflammatory properties. 3. It may help boost your immune system. 4. It may help relieve cough. 5. It may help treat diarrhea. 6. It may act as a diuretic. 7. It may help treat ulcers.
Ketha	1. It has been reported to possess antimicrobial, insecticidal and nematicidal properties. 2. It is also known for its antioxidant, antiviral, antiparasitic, anti lithiasis, analgesic, hematological, antimalarial, anti-inflammatory and anti-fertility activity.
Punaar	1. It has curative properties. 2. Fruit treats nervousness, stomach upsets and fatigue. 3. The bark and juice from the leaves are given as a treatment for diarrhoea and cancer. 4. When the fruit's gummy substance is rubbed into the scalp, it treats dandruff and reduces hair shedding
Singhara, Kaudi	1. It is an Ayurvedic medicinal plant used as a traditional medicine for the treatment of various diseases. This plant extracts are known to have antibacterial, antifungal, antimalarial, anti-inflammatory, antioxidant, hepatoprotective and Immunosuppression activity
Pinhiri	1. It is bitter, astringent, stomachic, diuretic, febrifuge, and antiseptic. The whole plant is used in gonorrhea, menorrhagia, and other genital affections. It is useful in diarrhea, dysentery, ophthalmopathy, ulcers, and wounds
Poudina	1. It is generally considered cooling, calming, and phlegm resolving, and is incorporated in many traditional formulas to treat lung and stomach heat, febrile disease
Katla	1. It is good source of anti-oxidants
Suar	1. It is high in omega-3, (which can both) protect the heart from disease and lower the amount of cholesterol in the blood 2. Clearing the vessels : Eating fish can improve your circulation and reduce the risk of thrombosis. Joint benefits: 3. Helps in protecting eye-sights 4. It provides the body with many essential nutrients which keep us running smoothly, including iodine, selenium, zinc and potassium. Iodine is important for the thyroid gland, and selenium makes enzymes which can help to protect us from cancer. Fish and shellfish are also excellent sources of many vitamins, including vitamins A and D.
Sukhari	1. It is low in sodium and a good source of thiamin, niacin, vitamin B6, Inc, selenium and protein. 2. It is also lower in saturated fat than beef
Nari	1. It is used as a herbal medicine for the treatment of various diseases such as cancer, ageing, fever, rheumatism and diabetes. This plant can also be used as an antioxidant and radioprotective agent
Hari Pyaz	1. It is used as an alternative therapy for DM treatment. 2. It contains carbohydrates, fiber, vitamins, and secondary metabolites, such as β carotene that has an antioxidant activity
Kankaua	1. It is used as an ethno-medicinal herb for the treatment of eyesight problems, common colds, headaches, heart problems, wounds and festering sores; reduces fat accumulation and serum lipid concentrations; and the root exudates in soil root-zone have anti-termite, anti-fungal and anti-microbial activities
Nagphani	1. It is used for anti-inflammation 2. It is used medicinally by different cultures. 3. In Zulu culture the plant is used as a poultice and it is also taken to reduce high blood pressure. It is used by the Sotho for treating barren women. 4. It is used to treat infertility, burns, sore throats, sore eyes, dysentery, rashes and leprosy.
Kachnar	1. It is used for centuries as food resources and in traditional folk medicine for their nutritional properties and their benefit in chronic diseases, particularly diabetes, obesity, cardiovascular diseases, and cancer
Sarita	1. It is used for the treatment of bleeding hemorrhoids, cough, diarrhea, dysentery, heartburn, hematuria, indigestion, malaria, menorrhagia, skin diseases, sore throat, TB, dyspepsia, bronchitis, leprosy, ulcer, obesity and worms. It is also used as an astringent, tonic and anthelmintic.
Palas	1. It is used traditionally as alterative, laxative, demulcent, prurigo, eczema, dyspepsia tonic, diuretic, antiperiodic in fever, in malaria, joint pains and in skin diseases
Bramhi	1. It is useful in bone fractures, piles, hydrocele, liver disorders, gonorrhea, dysmenorrhea, biliousness and purifies blood. 2. It cures diarrhea, dysentery, sore throat, ulcers, tumors and neutralizes snake bite poison. A paste of the stem bark relieves body swelling. 3. Stem juice benefits if applied on goiter.
Munga	1. It may help boost cognitive function. ... 2. It may help treat Alzheimer's disease. ... 3. It may help reduce anxiety and stress. ... 4. It may act as an antidepressant. ... 5. It may improve circulation and reduce swelling. ... 6. It may help ease insomnia.
Karol	1. It oleifera Is Very Nutritious. ... 2. It oleifera Is Rich in Antioxidants. ... 3. It May Lower Blood Sugar Levels. ... 4. It oleifera May Reduce Inflammation. ... 5. It Can Lower Cholesterol.
Gilki	1. It possesses many pharmacological attributes such as antidiabetic, anthelmintic, antibacterial, antifungal, analgesic, anti-nociceptive, antirheumatic, hypolipidemic, antiatherosclerotic, anti-tumor, anti-giardial, antioxidant, anti-inflammatory, hepatoprotective, and anticonvulsant activities
Risua	1. It prevents and treats cold 2. It is also used for nasal swelling and sinus problems. 3. Some people use it for arthritis pain, muscle pain, and chest pain.
Neelgaye	1. It prevents and treats cold 2. It is also used for nasal swelling and sinus problems. 3. Some people use it for arthritis pain, muscle pain, and chest pain.
Bititi Kanda	1. It Provides a Large Source of L-Carnitine. 2. It Provides the "Master Antioxidant" Glutathione. 3. It is High in Protein and Helps Improve Muscle Mass. 4. It is Extremely Rich in Minerals. 5. Eating It Helps Prevent Iron Deficiency Anemia. 6. It Contains Carnosine, a Potent Amino Acid. 7. It is Full of Vitamins.
	1. It provides dietary energy in the form of carbohydrates, dietary fiber, vitamins, and minerals. 2. It gives more energy per land unit per day than those of cereal grains

Kakdi	1. It's High in Nutrients. Cucumbers are low in calories but high in many important vitamins and minerals. 2. It Contains Antioxidants. 3. It Promotes Hydration. 4. It May Aid in Weight Loss. 6. It May Lower Blood Sugar. 6. It Could Promote Regularity.
Kathal	1. jackfruit supplies plenty of nutritional perks: 2. It's low in calories, naturally fat- and sodium-free, provides ample vitamin A (in the form of beta-carotene) and vitamin C, and packs in a surprising blood pressure-lowering potassium
Bhed	1. Lamb is a type of red meat that comes from young sheep. Not only is it a rich source of high-quality protein, but it is also an outstanding source of many vitamins and minerals, including iron, zinc, and vitamin B12. 2. Because of this, regular consumption of lamb may promote muscle growth, maintenance, and performance.
Kataiyya	1. Leaf decoction is used to reduce swellings. 2. Macerated leaves are used for itch and fall of hair. 3. The flowers are good for inflammations, chronic pains in the muscles and the joints, lumbago, headache, and scabies.
Tendu Patta	1. Leaves are used as styptic, in the treatment of scabies and old wounds, and as laxative and carminative medicine
Laalbhaji, Lahsua, Norpa, Lauki Aam	1. Loaded with nutrients Rich source of calcium, iron
Ban Bhata	1. Mango is a low-calorie fruit that is high in fibre, and is a great source of vitamins A and C. It also contains folate, B6, iron and a little calcium, zinc and vitamin E. 2. Mangoes are a good source of antioxidants, containing certain phytochemicals such as gallotannins and mangiferin
Bihl	1. Many of the medicinal uses of Solanum incanum are based on its analgesic properties. 2. Sore throat, angina, stomach-ache, colic, headache, painful menstruation, liver pain and pain caused by onchocerciasis, pleurisy, pneumonia and rheumatism are treated with Solanum incanum
Bihl	1. May Help Lower Blood Sugar Levels. ... 2. May Boost Heart Health. ... 3. May Help Relieve Painful Symptoms of Menstruation. ... 4. May Benefit Your Digestive System. ... 5. May Aid Weight Loss. ... 6. May Have an Anticancer Effect. ... 7. May Help Boost Your Immunity. ... 8. Eating Guavas May Be Good for Your Skin.
Peanuts	1. Most of the fats in peanuts are monounsaturated and polyunsaturated fatty acids, which are a healthful type of fat. 2. Good source of fiber. Fiber is a heart-healthful nutrient. The AHA report that eating fiber-rich foods improves blood cholesterol levels and lowers the risk of heart disease, stroke, obesity, and type 2 diabetes. 3. supporting heart health 4. maintaining a healthy weight 5. managing blood sugar
Rai Bhaji	1. Mustard greens are packed with energy-boosting, heart-healthy, disease-fighting nutrients. These greens are a delicious source of calcium, magnesium, folic acid and vitamin K, important for bone health.
Achar	1. Natural Coolant. ... 2. Promotes Skin Health. ... 3. Improves Digestion And Regularises Bowel Movement. ... 4. Improves Reproductive ealth. ... 5. Clears Nasal Congestion. ... 6. Health Weight Loss.
Moong	1. Packed With Healthy Nutrients. 2. High Antioxidant Levels May Reduce Chronic Disease Risk. 3. Antioxidants Vitexin and Isovitexin May Prevent Heat Stroke. 4. May Lower “Bad” LDL Cholesterol Levels, Reducing Heart Disease Risk. 5. Rich in Potassium, Magnesium and Fiber, Which May Reduce Blood Pressure.
Suran	1. Packed with nutrition. Yams are rich in vitamins, minerals, and fiber. ... 2. May enhance brain function. ... 3. May ease symptoms of menopause. ... 4. May have cancer-fighting properties. ... 5. May reduce inflammation. ... 6. May improve blood sugar control. ... 7. Easy to add to your diet.
Teetar	1. Partridge has high nutritional value . 2. It contains proteins, iron and selenium. 3. It also has vitamin B and is a good source of potassium and magnesium.
Sehi	1. Porcupine Liver Is Able to Treat Asthma 2. Low Fat Content 3. High in Protein Content 4. High in Protein Content 5. Speeds Up Healing Process 6. Almost Cholesterol Free 7. Rich of Omega 3 Fatty Acid 8. Improves Immunity System 9. Natural Solution to Impotence 10. Enhances Stamina
Chigul	1. Prawns are a rich source of selenium, one of the most effective antioxidants at maintaining healthy cells. 2. They also contain high levels of Zinc, which is important to develop a healthy immune system. 3. Eating prawns helps build strong bones because they contain phosphorous, copper and magnesium
Sakari, Sambal, Seori, Sindhi, Tigna, Tingar, Sora Corn	1. Red snapper contains omega-3 fatty acids, as well as vitamin D, E, selenium, magnesium, and potassium.
Rice	1. Reduces the risk of Anemia. 2. Corn is rich in Vitamin B12, folic acid and iron which helps in the production of red blood cells in the body. 3. Energy Enhancer. 4. Miracle for those underweight. 5. Lowers Blood Sugar & Cholesterol Level. 6. Helpful during Pregnancy. 7. Preserve Healthy Skin.
Katili Chaurai	1. Rice is a quick energy source. 2. Rice is generally safe for people with food sensitivities. 3. Brown rice is a good source of fiber. 4. Rice is an excellent source of vitamins and minerals. 5. Measurable levels of arsenic have been found in rice. 6. Brown rice may reduce body's ability to absorb other nutrients.
Ban Kachariya	1. Rich in iron, calcium and beta vitamins
Khamhar	1. Rockmelon (Cucumis melo L) has nutritional value namely carbohydrates, ascorbic acid, folic acid and potassium while the seeds are rich in oil and protein, and the compounds of this fruit are functioning to prevent cancer, fighting depression, dandruff, ulcers and stimulate the immune system.
Mukuia	1. Root and bark of Gmelina arborea are claimed to be stomachic, galactagogue laxative and anthelmintic; improve appetite, useful in hallucination, piles, abdominal pains, burning sensations, fevers, 'tridosha' and urinary discharge. A paste of the leaves has been applied to treat headaches associated with fever.
Palak	1. S. nigrum is a widely used plant in oriental medicine where it is considered to be antitumorogenic, antioxidant, anti-inflammatory, hepatoprotective, diuretic, and antipyretic
Kakun Millet	1. Spinach is rich in vitamins A, C and K, magnesium, iron and manganese. 2. It benefits eye health, reduce oxidative stress and reduce blood pressure levels among other health functions.
	1. Strengthens the immune system. 2. Enhances cell regeneration. 3. Reduces hypoxia (deprivation of oxygen supply) 4. Promotes healing. 5. Positively influences metabolism on a cellular level.

Shakarkand	1. Sweet potato is the king of root vegetables. 2. Sweet potato can add a healthy boost to our food. 3. Sweet potato is a good source of vitamin C and potassium
Tendu	1. Tendu fruit also helps in stomach disorders. 2. The dried fruit powder is used as carminative and astringent agent and is useful in treating urinary, skin and blood diseases
Sangri	1. Tepary beans contain high levels of soluble and insoluble fiber, helping lower LDL or bad cholesterol. This in turn, prevents buildup in the coronary arteries, which is great news for your heart. 2. Antioxidants found in these beans maintain youthful vitality and promote good health. These antioxidants help boost metabolism as well. 3. If you want to prevent constipation, improve GI tract functions, lower inflammation, and improve digestion in general then it's important to eat lots of Tepary beans. 4. B-vitamins prevent birth defects in unborn children and aid in every enzymatic process in the body. Good thing Tepary beans contain these types of nutrients.
Kachua,	1. Terminalia bellerica and Terminalia chebula are both used for high cholesterol and digestive disorders, including both diarrhea and constipation, and indigestion. 2. They have also been used for HIV infection.
Harra, Bahera	1. Terminalia bellerica is used to protect the liver and to treat respiratory conditions, including respiratory tract infections, cough, and sore throat. 2. Terminalia chebula is used for dysentery. 3. Terminalia bellerica and Terminalia chebula are used as a lotion for sore eyes
Kakai	1. The bark is used as a treatment for arthritis. 2. The plant is used to cure cough, bacterial throat infection and pneumonia. 3. The leaves are used as a cure for scabies and pruritus. 4. Fruits are used as an appetizer, digestive, jaundice, diuretic and enlarged spleen.
Chana	1. The fiber, potassium, B vitamins, iron, magnesium, and selenium in chickpeas all support heart health. 2. Fiber helps decrease the risk of heart disease by lowering cholesterol levels in the blood. 3. Chickpeas contain no cholesterol.
Sesame	1. The fiber, potassium, B vitamins, iron, magnesium, and selenium in chickpeas all support heart health. 2. Fiber helps decrease the risk of heart disease by lowering cholesterol levels in the blood. 3. Chickpeas contain no cholesterol.
Ber	1. The fruit is used as food and to make medicine. 2. Zizyphus is used for improving muscular strength and weight, for preventing liver and bladder diseases and stress ulcers, and as a sedative. 3. It is also used to reduce constipation and to reduce symptoms of some medications.
Babool	1. The leaves and bark of Babool are quite beneficial for healing wounds. 2. It has the ability to control the bleeding and infection which helps in healing wounds, cuts and injuries
Akola	1. The leaves of Alangium salviifolium are used as astringent, laxative, refrigerant. it is used for the treatment of rheumatism, leprosy, gastric ulcers, Wound healing, epilepsy, scabies, gonorrhea, jaundice, hepatitis, diabetes, syphilis
Chench	1. The leaves of Corchorus are rich in betacarotene, iron, calcium, and vitamin C. 2. The plant has an antioxidant activity with a significant α -tocopherol equivalent vitamin E.
Gulasi	1. The leaves of F. bengalensis is used as ulcer protective, leprosy and fever, inflammations(Ayurvedic). 2. The milky juice is aphrodisiac, tonic, vulnerary, maturant also useful in piles, diseases of the nose, gonorrhea. 3. Helpful in styptic, syphilis, biliousness, dysentery, inflammation of liver.
Bad/Bar	1. The leaves of F. bengalensis is used as ulcer protective, leprosy and fever, inflammations(Ayurvedic).The milky juice is aphrodisiac, tonic, vulnerary, maturant also useful in piles, diseases of the nose, gonorrhea. In Yunani the aerial root is styptic, syphilis, biliousness, dysentery, inflammation of liver.
Kundru	1. The leaves, root, and fruit are used to make medicine. 2. People take ivy gourd for diabetes, gonorrhea, and constipation. 3. Some people apply ivy gourd leaves directly to the skin for wounds.
Goh	1. The meat of monitor lizards is used for medicinal and food purpose.
Gajar	1. The pharmacological studies revealed that the plant possessed cytotoxic, antioxidant, antidiabetic, antimicrobial, smooth muscle relaxant, hypotensive effect and decrease intraocular pressure, gastro-protective, nephro-protective, hepato-protective, cardio-protective antidepressant memory enhancement,
Bathua	1. The plant has been traditionally used as a bloodpurifier, diuretic, sedative, hepatoprotective, antiscorbutic laxative and as an anthelmintic against round and hookworms. 2. Pharmacological studies have revealed that the plant possesses anthelmintic, sperm immobilizing and contraceptive properties.
Imli	1. The polyphenols in tamarind have antioxidant and anti-inflammatory properties. 2. These can protect against diseases such as heart disease, cancer and diabetes. 3. The seed extract may also help lower blood sugar, while the pulp extract may help you lose body weight and reverse fatty liver disease
Aaloo	1. The potato's fiber, potassium, vitamin C, and vitamin B6 content, coupled with its lack of cholesterol, all support heart health. Potatoes contain significant amounts of fiber. 2. Fiber helps lower the total amount of cholesterol in the blood, thereby decreasing the risk of heart disease
Paroda	1. The results indicated that Momordica dioica fruits could be a good supplement for some nutrients, minerals and fatty acids such as fiber, protein, carbohydrates, calcium, magnesium, Oleic acid, and Linoleic acid.
Amaltas	1. The root of amaltas is tonic, febrifuge, astringent and strong purgative. 2. They are specially used in joint pain, migraine, chest pain and blood dysentery. 3. Amaltas root is also useful in fever, heart diseases, retained excretions and biliousness
Chindi	1. The sap of the plant is a laxative and is nutritious and cooling whereas the central tender part of the plant is used in the treatment of gonorrhea. 2. The root of the plant is useful to treat toothache, nervous debility and helminthiasis.
Khatta Palak, Khatua	1. The seed is cooling. 2. It is roasted and used in the treatment of dysentery. 3. The juice of the plant is cooling. 4. It is useful in treating heat of the stomach, to allay the pain of toothache and, by its astringent properties, to check nausea.
Bater	1. This food is low in Sodium. It is also a good source of Thiamin, Riboflavin, Vitamin B6, Iron, Zinc and Selenium, and a very good source of Protein, Niacin, Phosphorus and Copper.
Tamatar	1. Tomatoes are the major dietary source of the antioxidant lycopene, which has been linked to many health benefits, including reduced risk of heart disease and cancer. 2. They are also a great source of vitamin C, potassium, folate, and vitamin K
Dhaman	1. Traditionally, different parts of the plant have been used in the treatment of ulcers, psoriasis, anemia, piles jaundice, vitiligo, hemorrhage, diabetes, convulsion, hepatitis, dysentery, biliousness, and as lactagogue and purgative.
Badki Kanda	1. Voigt, also known as Coccinia indica belongs to the family Cucurbitaceae. 2. It is extensively used in traditional medicine for the treatment of leprosy, jaundice, asthma, bronchitis, skin eruptions, burns, tongue sores, earache, indigestion, eye infections, nausea, insect bites, and fever.
Kamalkand	1. While leaves are used for hematemesis, epistaxis, and hematuria, the flowers are used for diarrhea, cholera, fever, and hyperdipsia.

	2. Rhizomes are promoted have purported diuretic, antidiabetic, and anti-inflammatory propertie
Jangli Suar	1. Wild boar is low in sodium and a good source of thiamin, niacin, vitamin B6, Inc, selenium and protein. 2. It is also lower in saturated fat than beef
Batakh	1. Zinc has a similar effect, regulating each part of the immune system, helping to kick those infections to the curb. 2. Duck is a good source of both minerals, in fact a single duck breast contains over a third of the daily recommended intake of selenium
Goolar	1.Ficus racemosa is Vitamin B2 and Iron rich fruit support for Astringent, 2.Anti-asthma, Anti-diabetic, Anti-diarrheal and Anti-pyretic activity
Amta, Amla,	1.It helps fight the common cold. The vitamin C in amla is absorbed more easily by the body compared to store-bought supplements. ... 2.It improves eyesight. ... 3.It burns fat. ..4.It builds immunity. ..5.Amla beautifies hair. ..6.It improves skin. ..7.It helps manage chronic conditions. ..8.It relieves pain
Bhindi	1.Okra is a nutritious food with many health benefits. It's rich in magnesium, folate, fiber, antioxidants, and vitamin C, K1, and A. Okra may benefit pregnant women, heart health, and blood sugar control. It may even have anticancer properties
Sem	1.Phaseolus vulgaris beans and bean pods are a source of dietary fiber. 2. Fiber might help to prevent cholesterol absorption and increase the elimination of fat from the diet. 3.Products containing Phaseolus vulgaris bean extracts often claim to be "starch blockers
Arbi	1.The health benefits of taro include its ability to improve digestion, lower your blood sugar levels, prevent certain types of cancers, protect the skin, boost vision health, increase circulation, decrease blood pressure, aid the immune system and prevent heart disease, while also supporting muscle and nerve health.
Kachua	1.Turtle meat has a lot of protein but very little fat and almost no carbohydrates2. It is also a source of several micronutrients - including selenium, vitamin B12, iron, potassium, thiamine, riboflavin and zinc.J
Menhar	Anti-Allergic activity - It is used in treatment of asthma, rhinitis, and cold. Anti-inflammatory activity - It is very effective to reduce the inflammation (shoth) and helpful in the treatment of edema, rheumatism. Analgesic activity - It has pain killer action (shoolanashaka)
Kodo	Anti-diabetic. Kodo millet intake is found to reduce fasting blood glucose level and promotes significant increase in serum insulin level. ... Antioxidant and anti-microbial activity. ..Anti-obesity. ..Anti-cholesterol and anti-hypertension. ..Helps in weight management. ... Cholesterol reduction.
Mooli Patta, Mooli	Chock full of vitamin A, C, E, B6, potassium, and other minerals, radishes can give your whole body an immunity boost. Mooli is also high on antioxidants and anthocyanins
Gulli	Flower extracts of Madhuca longifolia are used against heart diseases, leucorrhea, menorrhagia, polyuria, bronchitis, and tonsillitis. The bark of the tree is used for rheumatism, chronic bronchitis, diabetes mellitus, and bleeding
Gulli Ka Tel	Flower extracts of Madhuca longifolia are used against heart diseases, leucorrhea, menorrhagia, polyuria, bronchitis, and tonsillitis. The bark of the tree is used for rheumatism, chronic bronchitis, diabetes mellitus, and bleeding
Maize	Gluten-free. ..Rich in Fiber. ..Controls Blood Sugar Levels. ..High Protein. ..Full of Iron. ..Good for Bone Health. ..Packed with Vitamins, Minerals and Micronutrients. ..Weight Loss.
Kutki	Healthy heart, Balance cholesterol level, Prevent diabetes, Assist digestion, Prevent cancer High in Iron content & high in fibre that helps to reduce the fat depositions in the body. Heals all problems related to stomach and prevents constipation. These millets also helps women with irregular period problems. Kutki or Shavan has high antioxidant content.
Gullakdi	Inner Bark. The inner bark of a pine tree is located between the outer bark and the layer of soft wood. ..Seeds. Pine seeds, also known as pine nuts, are an edible part of pine trees
Jamun	Jamuns are low on calories, which makes them the perfect healthy snack.2. They also aid digestion and promote natural bowel movement. 3. Jamun juice has bioactive phytochemicals that minimise the risk of liver disease and cancer4. They are also known to be effective in treatment of diabetes.
Koilar	Packed with nutritio rich in beta carotene and other vitamins
Kosam	Schleichera oleosa, belonging to the Sapindaceae family, has been reported to possess antimicrobial, antioxidant, anticancer activity, and can be used for the production of biodiesel. The plant contains low tannin levels therefore it can be used as fodder for livestock.
Jungle Jalebi	The monkeypod tree is also useful for enriching its surrounding soil with nitrogen. Its foliage, flowers, and seed pods fall to the ground and decompose into nitrogen-rich matter. Botanists call this sort of tree "nitrogen fixing," as it nourishes and stabilizes the soil

Annexure 8: Identified local foods

SN	Traditional Food Name/ Item	Local Name/National Language Name (English Common Name)	Taxonomic classification	Districts 1. Niwadi 2. Panna 3. Rewa 4. Satna 5. Umaria 6. All					Seasonality	Part(s) used	Preparation	
A. Plant Origin												
Cereals												
	1	Rice	Rice	<i>Oryza rufipogon</i> Griff	1	2	3	4	5	July-April	seeds	Roti
	2	Wheat	triticum	<i>Triticum aestivum</i>	1	2	3	4	5	Nov-April	seeds	Rice
Fruits	1	aam	Mango	<i>Mangifera indica</i> L.	1	2	3	4	5	March-July	Fruits	Raw
	2	Akola	sage-leaved alangium	<i>Alangium lamarckii</i> Thw.					5	Oct-Feb	Fruits	Raw
	3	Bahera	bastard myrobalan	<i>Terminalia bellerica</i> , Roxb.	1		3		5	Oct-Feb	seeds	Raw
	4	Ban Angur	Vitaceae	<i>Cissus vitiginea</i>			3			Aug-Nov	Fruits	Raw
	5	Ban kachariya	Bitter cucumber	<i>Cucumis callosus</i> (Rottl) Cogn.		2	3		5	Oct-Feb	Fruits	Raw
	6	Ber	Chinese date	<i>Zizyphus mauritiana</i> Lamk.	1	2	3	4	5	Oct-Feb	Fruits	Raw
	7	Bihi	Guava	<i>Psidium guajava</i>	1	2	3	4	5	Oct-March	Fruits	Raw
	8	Chindi	Silver date palm	<i>Phoenix sylvestris</i>		2	3			March-May	Fruits	Raw
	9	dhaman	Fig	<i>Ficus hispida</i>		2				Nov-Jan	Fruits	Raw
	10	Ghui	Roxburgh fig	<i>Ficus auriculata</i>	1					Oct-Dec	Fruits	Raw
	11	Goolar	Cluster fig	<i>Ficus hispida</i> L.		2	3			Oct-Dec	Fruits	Raw
	12	Gulasi	Bargad phal	<i>Ficus benghalensis</i> L.			3	4	5	Oct-Dec	Fruits	Raw
	13	harra	Chebulic myrobalan	<i>Terminalia chebula</i>			3			Oct-Dec	Fruits	Raw
	14	imli	Tamarind	<i>Tamarindus indica</i> , Linn	1					Jan-Dec	Fruits	Raw
	15	jamun	Java plum	<i>Syzygium cumini</i>	1	2	3	4	5	Jun-Aug	Fruits	Raw
	16	jungle jalebi	Foreign tamarind	<i>Pithecellobium dulce</i> (Roxb.)			3			Jan-Dec	Fruits	Raw
	17	Kachariya	Cucurbitaceae	<i>Cucumis pubescens</i> Willd		2				Oct-Feb	Fruits	Raw
	18	Kachua,	Harad	<i>Terminalia</i> sps.		2				Oct-Feb	Fruits	Raw
	19	Kakai	ramontchi	<i>Flacourtia indica</i>					5	Jan-Dec	Fruits	Raw
	20	kakdi	Cucumber	<i>Cucumis sativus</i>	1	2	3	4	5	Aug-Oct	Fruits	Raw
	21	kataiyya	Apocynaceae	<i>Carissa apeca</i> Linn.	1	2	3	4	5	Jan-Dec	Fruits	Raw
	22	kathjamun	Eugenia	<i>Eugenia heyneana</i> Wall.				4		Oct-Feb	Fruits	Raw
	23	ketha	Wood apple	<i>Limonia acidissima</i>			3			Oct-Feb	Fruits	Raw
	24	khajoor	Dates	<i>Phoenix sylvestris</i> (L) Roxb.	1					Jan-Dec	Fruits	Raw
	25	Khirni	Sapotaceae	<i>Manilkara hexandra</i> (Rox) Dub.			3	4	5	Jan-Dec	Fruits	Raw
	26	kosam	Oken	<i>Schleichera oleosa</i> Oken.				4		Oct-Feb	Fruits	Raw

			(Sapindaceae)									
27	kundru	Scarlet gourd	<i>Coccinea grandis (L.)</i>	1	2	3	4	5	Oct-Feb	Fruits	Raw	
28	makor	jujube	<i>Zizyphus oenoplea (L.) Mill.</i>	1					Oct-Feb	Fruits	Raw	
29	menhar	karai	<i>Randia dumetorum</i>		2	3	4	5	Jan-Dec	Fruits	Raw	
30	neem ka phal	Indian lilac	<i>Azadirachta indica</i>					5	Jan-Dec	Fruits	Raw	
31	papita	Papaya	<i>Carica papaya</i>					5	June-Dec	Fruits	Raw	
32	penhta	Kigelia	<i>Kigelia africana</i>			3		5	Jan-Dec	Fruits	Raw	
33	rajmukod	laran	<i>Neolamarckia cadamba</i>		2				Oct-Feb	Leaves	Raw	
34	safed musli	Musli	<i>Chlorophytum tuberosum</i>			3			Oct-Feb	Fruits	Raw	
35	seetaphal	Custard Apple	<i>Annona squamosa L</i>					6	Oct-Feb	Fruits	Raw	
36	Singhara, Kaudi	water chestnut	<i>Trapa bispinosa Roxb.</i>					6	Oct-Feb	Fruits	Raw	
37	sukhari	Kukubicha	<i>Grevia hirsute Vahl.</i>			3			Sep-Oct	Fruits	Raw	
Green Leafy Vegetables												
1	Alsi	Linseed	<i>Linum usitatissimum</i>	1		3	4	5	Oct-Feb	seeds	Pounded to oil	
2	Amaltas	golden shower	<i>Cassia fistula Linn</i>					5	Oct-Feb	Leaves	Boiled, Curry	
3	amta	Indian gooseberry	<i>Phyllanthus emblica</i>				4		Oct-Feb	Fruits	Boiled, Curry	
4	bathua	lamb's quarters	<i>Chenopodium album L</i>	1	2	3	4	5	Jan-Dec	Leaves	Boiled, Curry	
5	Bramhi	Apiaceae	<i>Hydrocotyle asiatica</i>		2	3			Jan-Dec	Leaves	Boiled, Curry	
6	Chachinda	Snake gourd	<i>Trichosanthes cucumerina L</i>		2	3		5	Oct-Feb	Leaves	Boiled, Curry	
7	chamrai	Amarnath	<i>Amaranthus viridis Linn</i>		2	3	4	5	Jan-Dec	Leaves	Boiled, Curry	
8	chench	Wild jute	<i>Corchorus trilocularis Lamk</i>	1	2	3	4	5	Jan-Dec	Leaves	Boiled, Curry	
9	chorai	Green Amaranth	<i>Amaranthus viridis</i>	1	2	3	4	5	Jan-Dec	Leaves	Boiled, Curry	
10	Curry Neem	Neem	<i>Murraya koengii, Spreng.</i>					6	Jan-Dec	Leaves	Boiled, Curry	
11	kachnar	Orchid tree	<i>Bauhinia variegata L.</i>				4		Oct-Feb	Flower	Boiled, Curry	
12	kankaua	Benghal dayflower	<i>Commelina benghalensis L.</i>	1	2	3	4	5	June-Aug	Leaves	Boiled, Curry	
13	karol	Karira	<i>Capparis aphylla Roth</i>					5	Oct-Feb	Leaves	Boiled, Curry	
14	Katili chaurai	Amaranthaceae	<i>Amaranthus spinosus L.</i>		2				Oct-Feb	Leaves	Boiled, Curry	
15	Khatta Palak, Khatua	Bladder dock	<i>Rumex vesicarius L.</i>			3		5	Oct-Feb	Vegetables	Boiled, Curry	
16	koilar	Purple Nauhinia	<i>Bauhinia perpurea Linn.</i>	1	2	3	4	5	Oct-Feb	Leaves	Boiled, Curry	
			(Caesalpiniaceae)									
17	laalbhaji	Mat amranth	<i>Amaranthus blitoides</i>	1	2	3	4	5	Oct-Feb	Leaves	Boiled, Curry	
18	lahsua	Amaranthus	<i>Digera arvensis Forssk</i>	1	2	3	4	5	Oct-Feb	Leaves	Boiled, Curry	
19	methi	Fenugreek	<i>Trigonella foenum-graecum</i>	1	2	3	4	5	June-Jan	Vegetables	Boiled, Curry	
20	mooli patta	Daikon	<i>Raphanus sativus var. Longipinnatus</i>					6	Jan-Dec	Root	Boiled, Curry	
21	mukuiyya	Black nightshade	<i>Solanum nigrum</i>	1		3	4		Oct-Feb	Leaves	Boiled, Curry	
22	Nagphani	Cactaceae	<i>Opuntia aciculata Griffiths</i>			3		5	Apr-May	Leaves	Boiled, Curry	
23	nari	Water spinach	<i>Ipomoea eqatica Forssk.</i>	1		3		5	Jan-Dec	Leaves	Boiled, Curry	
24	nonia	Moss rose	<i>Portulaca grandiflora</i>	1	2	3	4	5	Oct-Feb	leaves	Boiled, Curry	
25	norpa	amaranthus	<i>Amaranthus Lividus</i>	1	2			5	Oct-Feb	leaves	Boiled, Curry	
26	palak	spinach	<i>Spinacia oleracea</i>					6	Jan-Dec	Leaves	Boiled, Curry	
27	phang	idnapore creeper	<i>Rivea hypocrateriformis</i>	1	2		4	5	Oct-Feb	Leaves	Boiled, Curry	

28	pinhiri	Bamboo leaves	<i>Bambusoideae</i>					5	Jan-Dec	Leaves	Boiled, Curry
29	Poi	Basellaceae	<i>Basella alba L</i>					5	Oct-Feb	Leaves	Boiled, Curry
30	Poudina	Mint	<i>Mentha arvensis L.</i>					6	Jan-Dec	Leaves	Boiled, Curry
31	Punaar	Caesalpiniaceae	<i>Cassia obtusifolia Linn.</i>			3	4	5	Oct-Feb	Leaves	Boiled, Curry
32	Rai	Mustard	<i>Brassica nigra</i>	1				5	Oct-Feb	seeds	Pounded to oil, Curry
33	rai bhaji	Black mustard	<i>Brassica nigra</i>	1				5	July-Sep	Leaves	Boiled, Curry
34	Ramtila	Niger seeds	<i>Guizotia abyssinica</i>					5	Oct-Feb	seeds	Boiled, Curry
35	sarita	broom creeper	<i>Cocculus hirsutus (L.) Diel</i>					4	Oct-Feb	Leaves	Boiled, Curry
36	sarso	White Mustard	<i>Brassica juncea</i>		2	3	4		Oct-Feb	Leaves	Boiled, Curry
37	Sarson	Mustard	<i>Sinapis alba</i>		2				Oct-Feb	seeds	Boiled, Curry
38	Sesame	Til	<i>Sesamum indicum</i>	1	2	3	4	5	Oct-Feb	seeds	Pounded to oil
39	Midnight creeper	Phang	<i>Rivea hypocrateriformis (Desr.) Choisy</i>			3		5	Oct-Feb	Leaves	Boiled, Curry
Grass											
1	Sugarcane	Sugarcane	<i>Saccharum officinarum</i>	1					July-Oct	Stem	Raw,
Herbs											
1	chirota	Bitter stick	<i>swertia chirata</i>			3	4	5	Oct-Feb	Leaves	Vegetable curry
2	dudhia	Milk hedge	<i>Euphorbia nivulia</i>			3			Nov-Jan	leaves	Vegetable curry
3	kaitha	Bella	<i>Feronia elephantum L. (Corr)</i>	1	2	3	4	5	Jan-Dec	Fruits	Vegetable curry
4	Patherchatta	Punarnava	<i>Boerhaavia diffusa L., Nyctaginaceae, Herb</i>			3			Jan-Dec	Leaves	Vegetable curry
Millets											
1	Bajra	Pearl millet	<i>Pennisetum glaucum</i>			3			July-Oct	seeds	Roti, bhakri
2	Corn	Maize	<i>Zea mays</i>					5	July-Sep	seeds	Roasted
3	Kakun Millet	Foxtail	<i>Setaria italica</i>				4	5	July-Oct	seeds	Pounded to rice
4	Kodo	Kodo millet	<i>Paspalum scrobiculatum</i>					5	June-Feb	seeds	Pounded to rice
5	Kutki	Little Millet	<i>Panicum miliaceum</i>					5	June-Feb	seeds	Pounded to rice
6	Maize	Sorghum	<i>Sorghum bicolor</i>		2	3	4	5	June-Feb	seeds	Flour
7	Sanwa	Barnyard Millet	<i>Echinochloa esculenta</i>			3			Sep-Oct ; Feb-March	seeds	Flour, Rice
NTFP											
1	achar	chirauli	<i>Buchanania latifolia, Roxb.</i>	1	2	3	4	5	Apr-May	Fruits	deseeded to fruit
2	amla	Indian gooseberry	<i>Phyllanthus emblica</i>	1	2	3	4	5	Oct-Feb	Fruits	Raw, dried, powder
3	bel	Golden apple	<i>Aegle marmelos Corr. (Rutaceae)</i>	1	2	3	4		June-Oct	Fruits	Raw,
4	gulli	Mahua	<i>Madhuca longifolia</i>	1	2	3	4	5	March-Apri	Seeds, Flowers	Raw
5	Gulli ka tel	Mahua's oil	<i>Madhuca longifolia</i>	1	2	3	4	5	March-Apri	Seeds, Flowers	Pounded to oil
6	tendu	Indian ebony	<i>Diospyros melanoxylon</i>					6	March-May	Fruits	Raw
7	tendu Patta	Indian ebony	<i>Diospyros melanoxylon</i>					6	March-May	Fruits	Commercial
Pulses and legumes											
1	Arhar	Split red grams	<i>Cajanus cajan</i>	1	2	3	4	5	Oct-Feb	seeds	boiled, Steamed
2	Banmungiya	Three-lobed leaf cowpea	<i>Vigna Trilobata (L.) Verdc.</i>			3			Oct-Feb	seeds	boiled, Steamed

3	Chana	Chickpea	<i>Cicer arietinum</i>	1	2	3	4	5	Oct-Feb	seeds	boiled, Steamed
4	Masoor	Split red lentils	<i>Lens culinaris</i>		2		4	5	Oct-Feb	seeds	boiled, Steamed
5	Moong	Green gram	<i>Vigna radiata</i>	1	2	3	4		July-Oct	seeds	boiled, Steamed
6	Peas	Garden peas	<i>Pisum sativum</i>			3		5	Oct-Feb	seeds	boiled, Steamed
7	Soyabean	Soybean	<i>Glycine max</i>	1	2			5	July-Oct	seeds	boiled, Steamed
8	Urad	Black gram	<i>Vigna mungo</i>	1	2	3	4	5	July-Oct	seeds	boiled, Steamed
Roots and Tubers											
1	aaloo	Potato	<i>Solanum tuberosum</i>	1	2	3	4	5	Jan-Dec	Root	Curry, Vegetable, roasted, boiled
2	angeetha	doub palm	<i>Borassia flabellifer</i>	1	2	3	4	5	Oct-Feb	Fruits	Raw, Ripe
3	arbi	Taro	<i>Colocasia esculenta</i>	1	2	3	4	5	Oct-Feb	Tubers	Curry, Vegetable, roasted, boiled
4	Bad/Bar	Banyan	<i>Ficus benghalensis, Linn</i>			3	4	5	Oct-Feb	Fruits	Raw roasted
5	badki kanda	Ivy gourd	<i>Coccinia grandis Voigt.</i>					5	Jan-Dec	Tubers	Raw roasted
6	bakaina	chinaberry tree	<i>Melia azedarach</i>			3			Oct-Feb	seeds	Raw roasted
7	baseeda	Lotus root	<i>Nelumbo nucifera</i>				4		Aug-Nov	Stem	Raw roasted
8	Bilaikand	Purple Yam	<i>Dioscorea alata Linn.</i>					5	Aug-Nov	Rhizomes	Raw roasted
9	bitti kanda	Bitti	<i>Thevetia peruviana</i>					5	Jan-Dec	Rhizomes	Raw roasted
10	Gainthi	Yam	<i>Dioscorea bulbifera L.,</i> <i>Dioscoreaceae, Climber,</i>	1					Oct-Feb	Tubers	Raw roasted
11	gajar	Carrot	<i>Daucus carota</i>					6	Jan-Dec	Root	Seasoned
12	Ghuguchi	jequirity bean	<i>Abrus precatorius L.</i>	1					Oct-Feb	Leaves	Raw roasted
13	gilchi	Coffee plum	<i>Casearia graveolens</i>					5	Oct-Feb	Root	Raw roasted
14	gursakri	Grewia	<i>Grewia hirsuta</i>			3			Oct-Feb	Rhizomes	Raw roasted
15	Kamalkand	Indian lotus	<i>Nelumbium speciosum Willd.</i>	2					Oct-Feb	Root	Raw roasted
16	kathal	jackfruit	<i>Artocarpus heterophyllus</i>		2			5	Jan-Dec	Tubers	Raw roasted
17	Khamhar	Gambhari	<i>Gmelina arborea Roxb.</i> <i>(Verbenaceae)</i>					5	Apr-June	Fruits	Raw roasted
18	mooli	Daikon	<i>Raphanus sativus var.</i> <i>Longipinnatus</i>					6	Jan-Dec	Root	Raw roasted
19	Peanuts	Groundnuts	<i>Arachis hypogaea</i>	1					July-Oct	seeds	Raw roasted
20	ratalu	Purple Yam	<i>Dioscorea alata</i>	1					Jan-Dec	Rhizomes	Raw roasted
21	satawar	Shatawari	<i>Asparagus racemosus Willd.</i>			3			Jan-Dec	Rhizomes	Raw roasted
22	shakarkand	Sweet Potato	<i>Ipomoea batatas</i>			3	4	5	Jan-Dec	Root	Raw roasted
23	suar kanda	Surka	<i>Nymphoides indica (L.)</i> <i>Kuntze</i>					5	Oct-Feb	Rhizomes	Raw roasted
24	Suran	Elephant Foot Yam	<i>Amorphophallus paeoniifolius</i>	1	2	3	4	5	Oct-Feb	Rhizomes	Raw roasted
25	karonda	conkerberry	<i>Carissa sapinarum</i>		2	3	4	5	Oct-Feb	Leaves	Raw roasted
26	Babool	gum arabic tree	<i>Acacia nilotica</i>			3		5	Oct-Feb	Sap	Raw roasted
Vegetables											
1	baigan	Brinjal	<i>Solanum melongena</i>					6	Oct-Feb	Fruits	Vegetable curry
2	Ban Bhata	Wild brinjal	<i>Solanum incanum</i>			3	4		Oct-Feb	Fruits	Vegetable curry

3	Ban Bhindi	Hairy Okra	<i>Abelmoschus crinitus</i> Wall.	1	3					June-Aug	Fruits	Vegetable curry
4	barbati	Lubiya	<i>Vigna unguiculata</i> subsp. <i>Sesquipedalis</i>	1	2	3	4	5		Oct-Feb	Pods	Vegetable curry
5	bhindi	Okra, Ladies finger	<i>Abelmoschus esculentus</i>	1	2	3	4	5		Jan-Dec	Fruits	Vegetable curry
6	Bondi	Edible mushroom	<i>Agaricus bisporus</i>		2	3	4	5		Jan-Dec	Fruits	Vegetable curry
7	Gilki	Sponge gourd	<i>Luffa acutangula</i>						6	Jan-Dec	Fruits	Vegetable curry
8	gobhi	Cauliflower	<i>Brassica oleracea</i>						6	June-Aug	Flower	Vegetable curry
9	gullakdi	Pine tree	<i>Pinus roxburghii</i>			3				Jan-Dec	seeds	Vegetable curry
10	hari pyaz	Welsh onion	<i>Allium fistulosum</i>						6	Oct-Feb	Flower	Vegetable curry
11	kaddu	Red pumpkin	<i>Cucurbita ficifolia</i>						6	Jan-Dec	Fruits	Vegetable curry
12	karela	Bitter gourd	<i>Momordica charantia</i>						6	Oct-Feb	Fruits	Vegetable curry
13	Karelia	Bitter gourd small	<i>Momordica charantia</i> Linn						6	Oct-Feb	Fruits	Vegetable curry
14	kumhdha	Squash	<i>Cucurbita maxima</i>		2					Oct-Feb	Fruits	Vegetable curry
15	lauki	White bottle gourd	<i>Lagenaria siceraria</i>	1	2	3	4	5		Jan-Dec	Fruits	Vegetable curry
16	matar	Peas	<i>Pisum sativum</i>						6	Oct-Feb	Pods	Vegetable curry
17	munga	Drumstick	<i>Moringa oleifera</i> , Lam.			3				Jan-Dec	Leaves, Fruits	Flowers, Vegetable curry
18	Palas	Flame of the forest	<i>Butea monosperma</i> Lamk. (Fabaceae)	1						March-May	flower	Vegetable curry
19	paroda	spiny gourd	<i>Momordica dioca</i> Roxb.	1	2	3	4	5		Oct-Feb	Fruits	Vegetable curry
20	risua	Ridge gourd	<i>Luffa aegyptiaca</i>		2	3	4			Oct-Feb	Fruits	Vegetable curry
21	Sangri	Tepary bean	<i>Phaseolus acutifolius</i>	1						Oct-Feb	seeds	Vegetable curry
22	sem	Green beans	<i>Phaseolus vulgaris</i>						6	Jan-Dec	Pods	Vegetable curry
23	tamatar	Tomato	<i>Solanum lycopersicum</i>						6	Jan-Dec	Fruits	Vegetable curry
Weed												
1	chakoda	Sickle Senna	<i>Cassia tora</i>	1	2	3	4	5		June-Aug	Leaves	Vegetable curry
B. Plant Origin												
Eggs												
1	machhli	lava heron	<i>Butorides sundevalli</i>		2			5		Oct-March	Yolk	Curry
2	batakh	Domestic duck	<i>Anas platyrhynchos domesticus</i>		2	3	4	5		Oct-March	Yolk	Curry, boiled, Fried
3	Bater	Common quail	<i>Coturnix coturnix</i>		2					Oct-March	Yolk	Curry, boiled, Fried
4	desi murgi	Domestic chicken	<i>Gallus gallus domesticus</i>					5		Oct-March	Yolk	Curry, boiled, Fried
5	Dokia	Spotted dove	<i>Spilopelia chinensis</i>					5		Oct-March	Yolk	Curry, boiled, Fried
6	jal murgi	Common moorhen	<i>Gallinula chloropus</i>					5		Oct-March	Yolk	Curry, boiled, Fried
7	Kekda	Crabs	<i>Brachyura</i>	1	2					Oct-March	Yolk	Curry, boiled, Fried
8	lava	lava heron	<i>Butorides sundevalli</i>					5		Oct-March	Yolk	Curry, boiled, Fried
9	machhli	lava heron	<i>Butorides sundevalli</i>	1	2					Oct-March	Yolk	Curry, boiled, Fried
10	mor	Peacock	<i>Pavo cristatus</i>	1				5		Oct-March	Yolk	Curry, boiled, Fried
11	murgi	Hen	<i>Gallus gallus domesticus</i>	1	2	3	4	5		Oct-March	Yolk	Curry, boiled, Fried
12	Teetar	Grey Partridge	<i>Perdix perdix</i>	1	2	3		5		Oct-March	Yolk	Curry, boiled, Fried
13	van murgi	Red junglefowl	<i>Gallus gallus</i>	1		3		5		Oct-March	Yolk	Curry, boiled, Fried
Fish												
1	bam	Indian mottled eel	<i>Anquilla bengalensis bengalensis</i>			3	4	5		Sep-March	Whole	Curry
2	chalia	filefish	<i>Monacanthus chinensis</i>	1						Sep-March	Whole	Curry
3	chamni	brahmi	<i>Bacopa monnieri</i>					5		Sep-March	Whole	Curry

4	chandeni	Small fish	freshwater	<i>Puntius Puntigurus</i>					5	Sep-March	Whole	Curry
5	channa	Hardenberg's anchovy		<i>Stolephorus indicus</i>					5	Sep-March	Whole	Curry
6	chigul	giant tiger prawn		<i>Penaeus monodon Fabricius</i>				4		Sep-March	Whole	Curry
7	chilhathi	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
8	chinga	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
9	chingadha	Cuttle fish		<i>Sepidae</i>					5	Sep-March	Whole	Curry
10	Dedka	The mackerel	Indian	<i>Rastrelliger kanagurta</i>				3		Sep-March	Whole	Curry
11	drai	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
12	Fish	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
13	garhni	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
14	gohariya	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
15	gulhun	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
16	jheenga	Prawn		<i>Dendrobranchiata</i>	1	2	3	4	5	Sep-March	Whole	Curry
17	kachua	Turtle		<i>Testudines</i>	1	2	3	4	5	Sep-March	Whole	Curry
18	katla	Catla		<i>Catla catla</i>					6	Sep-March	Whole	Curry
19	katua	cyprinid		<i>Schizothorax</i>				4	5	Sep-March	Whole	Curry
20	kechuhi	Small fish	freshwater	<i>Unidentified</i>				3		Sep-March	Whole	Curry
21	kekda	Crabs		<i>Brachyura</i>	1	2	3	4	5	Sep-March	Whole	Curry
22	khadayya	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry
23	kusma	ray-finned fish		<i>Schizothorax plagiostomus</i>					5	Sep-March	Whole	Curry
24	Magur	Walking catfish		<i>Clarias batrachus</i>	1		3			Sep-March	Whole	Curry
25	manja	Malabar jack		<i>Malabar trevally</i>					5	Sep-March	Whole	Curry
26	marahu	Small fish	freshwater	<i>Unidentified</i>			3			Sep-March	Whole	Curry
27	mirgal	Mrigal carp		<i>Cirrhinus cirrhosus</i>					5	Sep-March	Whole	Curry
28	padhin	Catfish		<i>Wallago attu</i>	1		3		5	Sep-March	Whole	Curry
29	Rohu	Rohu labeo		<i>Labeo rohita</i>	1	2	3	4	5	Sep-March	Whole	Curry
30	rusi	Small fish	freshwater	<i>Unidentified</i>			2			Sep-March	Whole	Curry
31	sakari	Humpback snapper	red	<i>Lutjanus gibbus.</i>					5	Sep-March	Whole	Curry
32	sambal	Small fish	freshwater	<i>Unidentified</i>					5	Sep-March	Whole	Curry

33	seori	Small fish	freshwater	<i>Unidentified</i>	3		Sep-March	Whole	Curry
34	sindhi	ilsh		<i>Tenuulosa ilisha</i>	3		Sep-March	Whole	Curry
35	sora	Small fish	freshwater	<i>Unidentified</i>	1		Sep-March	Whole	Curry
36	tigna	Small fish	freshwater	<i>Unidentified</i>	3		Sep-March	Whole	Curry
37	tingar	Tiger fish		<i>Hydrocynus vittatus</i>	2	3	Sep-March	Whole	Curry
Meat									
1	bakra	Domestic goat		<i>Capra aegagrus hircus</i>	1	2 3 4 5 6	Jan-Dec	Mutton, and organ meat	Curry. Roasted, special preepartion during festivities
2	barasingha	Swamp deer		<i>Rucervus duvaucelii</i>		5	Jan-Dec	Mutton, and organ meat	Curry, Roasted
3	bhed	Sheep		<i>Ovis aries</i>		4	Jan-Dec	mutton	Curry, Roasted
4	cheetal	Spotted deer		<i>Axis axis</i>	2	3	Jan-Dec	Mutton, and organ meat	Curry, Roasted
5	Chinkara	Indian gazelle		<i>Gazella bennettii</i>		4	Jan-Dec	Mutton, and organ meat	Curry, Roasted
6	goh	Bengal Monitor		<i>Varanus bengalensis</i>	1		Jan-Dec	mutton	Curry, Roasted
7	hiran	Deer		<i>Cervidae</i>		3	Jan-Dec	Mutton, and organ meat	Curry, Roasted
8	jangli suar	Wild boar		<i>Sus scrofa</i>		5	Jan-Dec	Mutton, and organ meat	Curry, Roasted
9	khargosh	Rabbit		<i>Oryctolagus Cuniculus</i>		3	Jan-Dec	mutton	Curry, Roasted
10	neelgaye	Blue bull		<i>Boselaphus tragocamelus</i>	2		Jan-Dec	Mutton, and organ meat	Curry, Roasted
11	sambhar	Sambar deer		<i>Rusa unicolor</i>		3	Jan-Dec	Mutton, and organ meat	Curry, Roasted
12	sehi	Porcupine		<i>Erethizon dorsatum</i>	1		Jan-Dec	Mutton	Curry, Roasted
13	Suar	Pig		<i>Sus scrofa</i>		3	Jan-Dec	Mutton, and organ meat	Curry, Roasted
14	barahsingha	Swamp deer		<i>Rucervus duvaucelii</i>	1	4	Jan-Dec	Mutton	Curry, Roasted
15	go	Bengal Monitor		<i>Varanus bengalensis</i>		3	Jan-Dec	Mutton	Curry, Roasted
Poultry									
1	batakh	Domestic duck		<i>Anas platyrhynchos domesticus</i>		3	Jan-Dec	mutton	Curry
2	bater	Common quail		<i>Coturnix coturnix</i>	1	2 3 4 5	Jan-Dec	mutton	Curry
3	desi murgi	Domestic chicken		<i>Gallus gallus domesticus</i>		5	Jan-Dec	mutton	Curry
4	dokia	Spotted dove		<i>Spilopelia chinensis</i>	1	3 4 5	Jan-Dec	mutton	Curry
5	jal murgi	Common moorhen		<i>Gallinula chloropus</i>	2	4 5	Jan-Dec	mutton	Curry
6	kabootar	Dove		<i>Zenaida asiatica</i>		5	Jan-Dec	mutton	Curry
7	Lava	lava heron		<i>Butorides sundevalli</i>		5	Jan-Dec	mutton	Curry
8	mor	Peacock		<i>Pavo cristatus</i>	1	2 3 4 5	Jan-Dec	mutton	Curry
9	Murqa	Chicken		<i>Gallus gallus</i>	1	2 3 4 5	Jan-Dec	mutton	Curry
10	Murgi	Hen		<i>Gallus gallus domesticus</i>	1	2 3 4 5	Jan-Dec	mutton	Curry
11	teetar	Grey Partridge		<i>Perdix perdix</i>	1	2 3 4 5	Jan-Dec	Mutton	Curry

12	van murgi	Red junglefowl	<i>Gallus gallus</i>	1	2	3	4	5	Jan-Dec	Mutton	Curry
13	jalmurgi	Common moorhen	<i>Gallinula chloropus</i>	1					Jan-Dec	Whole	Curry
14	vanmugi	Red junglefowl	<i>Gallus gallus</i>	1	2	3			Jan-Dec	Whole	Curry

Annexure 9 : List of Unidentified foods

SN	traditional food name/ item	Local Name (English Common Name)	Taxonomic classification	Districts 1. Niwadi 2. Panna 3. Rewa 4. Satna 5. Umaria 6. All						Origin 1. Plant Origin 2. Animal Origin	Food group/ category	Part(s) used
1	barari	Unspecific	Unidentified			3				Plant origin	Fruits	Fruits
2	bhadel	Unspecific	Unidentified				4			Plant origin	Fruits	Fruits
3	bhilna	Unspecific	Unidentified					5		Plant origin	Fruits	Fruits
4	bhirada	Unspecific	Unidentified		2					Plant origin	Fruits	Fruits
5	ghataru	Unspecific	Unidentified		2					Plant origin	Fruits	Fruits
6	senhua	Unspecific	Unidentified	1						Plant origin	Fruits	Fruits
7	akri	Unspecific	Unidentified	1						Plant origin	GLV	Leaves
8	amila	Unspecific	Unidentified			3				Plant origin	GLV	Leaves
9	bharota	Unspecific	Unidentified	1	2	3	4	5		Plant origin	GLV	Leaves
10	chandoli	Unspecific	Unidentified			3				Plant origin	GLV	Leaves
11	chhiraru	Unspecific	Unidentified	1						Plant origin	GLV	Leaves
12	chorba	Unspecific	Unidentified			3				Plant origin	GLV	Leaves
13	dangri	Unspecific	Unidentified	1						Plant origin	GLV	Leaves
14	hiraru	Unspecific	Unidentified		2					Plant origin	GLV	Leaves
15	kachhar	Unspecific	Unidentified			3	3	3		Plant origin	GLV	Leaves
16	marasa	Unspecific	Unidentified			3				Plant origin	GLV	Leaves
17	moosri	Unspecific	Unidentified				4			Plant origin	GLV	Leaves
18	peori	Unspecific	Unidentified				4			Plant origin	GLV	Leaves
19	sirwari	Unspecific	Unidentified				4			Plant origin	GLV	Leaves
20	tipni	Unspecific	Unidentified	1						Plant origin	GLV	Leaves
21	hadil	Unspecific	Unidentified	1			4	5		Animal Origin	Meat	mutton
22	dhunia sanwa	Unspecific	Unidentified		2					Plant origin	Millets	grains
23	kundwa	Unspecific	Unidentified		2					Plant origin	Millets	grains
24	basara	Unspecific	Unidentified		2					NA	NA	NA
25	dhukra	Unspecific	Unidentified		2					NA	NA	NA
26	khakoodan	Unspecific	Unidentified		2					NA	NA	NA
27	moohar	Unspecific	Unidentified			3				NA	NA	NA
28	nanni	Unspecific	Unidentified			3				NA	NA	NA
29	akaina	Unspecific	Unidentified			3				Plant origin	Roots and Tubers	Root
30	birain	Unspecific	Unidentified			3	4			Plant origin	Roots and Tubers	Rhizomes
31	khanima	Unspecific	Unidentified				4			Plant origin	Roots and Tubers	Root
32	khanua	Unspecific	Unidentified					5		Plant origin	Roots and Tubers	Root
33	mauri	Unspecific	Unidentified	1						Plant origin	Roots and Tubers	Rhizomes
34	udar	Unspecific	Unidentified		2					Plant origin	Roots and Tubers	Rhizomes
35	bhiladi	Unspecific	Unidentified		2					Plant origin	Vegetables	Fruits

Annexure 10 : Cost sheet

S N	District code	District code	Food Items	Food Categories	Type K= Kharif R = Rabi Type	Land preparation and sowing				Fertilizers and plant protection				Weeding	Irriga tion	Harvestin g	Production cost					
						Quantit y of seed (Kg) per acre	Cost per unit	Cost of seeds	Sowing	FYM (Farm Yard Manur e	DAP	Urea	insec tici des and pesti cieds	Hired labour (man days) used per acre	Irriga tion charg es	Harvestin g Charges	Total productio n	Use for Hous ehold Cons umpti on kgs	Quantit y Sold	Cost per unit (sellin g price)	Total incom e	Profit (+) / Loss(-)
1	2	2	Arhar	Pulses	K	8	50	400	1400	0	0	0	0	300	0	2000	150	45	105	40	105	-3995
2	3	3	Arhar	Pulses	K	8	50	400	1000	0	0	0	0	1000	1000	2000	200	100	100	32	100	-5300
3	4	4	Arhar	Pulses	K	20	40	800	2400	0	0	0	0	500	2000	2000	300	60	240	35	8400	700
4	5	5	Arhar	Pulses	K	2	50	100	1000	0	0	0	0	1000	1000	2000	300	300	0	50	0	-5100
		Mean	Arhar	Pulses	K	10	48	425	1450	0	0	0	0	700	1000	2000	238	126	111	39	2151	-3424
5	3	3	Arsi	Nuts/Oils	K	1	50	50	1000	0	0	0	0	1000	0	2000	40	40	0	40	0	-4050
6	2	2	Jowar	Millets	K	10	20	200	1400	0	1300	60	200	1000	0	2000	200	60	140	15	112000	105840
7	3	3	Jowar	Millets	K	10	20	200	1000	0	0	0	500	1000	2000	2000	200	100	100	15	80000	73300
		Mean	Arsi	Nuts/Oils	R	8	34	219	1213	0	325	15	175	1000	667	2000	147	67	80	23	64000	58363
8	3	Mean	Bajra	Millets	K	7	18	126	1000	0	0	0	0	1000	0	2000	200	50	150	16	0	-4126
		Mean	Bajra	Millets	K	9	23	186	1153	0	406	19	219	1000	889	2000	182	72	110	18	48000	42512
9	4	4	Jowar	Millets	K	7	20	140	1200	0	0	0	0	500	0	2000	800	200	600	18	10800	6960
10	5	5	Jowar	Millets	K	8	20	160	1500	0	0	0	0	500	0	2000	250	200	50	18	900	-3260
11	1	1	Moong	Pulses	K	5	35	175	1000	0	0	0	1000	1000	0	2000	200	20	180	37	6660	1485
12	2	2	Moong	Pulses	K	2	100	200	1400	0	1300	60	200	1000	0	2000	150	15	135	60	8100	1940
13	3	3	Moong	Pulses	K	8	100	800	1000	0	0	0	500	1000	3000	2000	50	10	40	45	6000	-2300
		Mean	Chana	Pulses	R	6	64	334	1225	0	325	12	340	800	600	2000	290	89	201	36	6492	965
14	5	Mean	Corn	Millets	K	4	70	280	1000	0	0	0	0	1800	2100	2000	300	250	50	12	600	-6580
15	3	Mean	Jawa	Millets	R	40	12	480	1000	0	260	140	0	1000	0	2000	500	100	400	15	0	-4880
16	4	4	Moong	Pulses	K	3	100	300	2400	0	0	0	500	500	0	3000	150	15	135	50	6750	50
17	2	2	Rice	Cereals	K	10	100	1000	1400	0	1300	275	500	1500	3000	2000	1000	300	700	16	11200	225
18	3	3	Rice	Cereals	K	20	15	300	1000	0	260	140	0	2000	1500	2000	1000	500	500	18	500	-6700
19	4	4	Rice	Cereals	K	5	100	500	3600	0	2400	450	500	2000	3000	2000	2000	700	1300	15	19500	5050
		Mean	Jowar	Millets	K	10	79	525	2100	0	990	216	375	1500	1875	2250	1038	379	659	25	9488	-344
20	5	Mean	Kakun	Millets	K	2	20	40	1500	0	0	0	0	0	0	0	30	20	10	18	180	-1360
21	5	Mean	Kodo	Millets	R	10	30	300	1000	0	0	0	0	1500	0	1500	1000	1000	0	60	0	-4300
22	5	Mean	Kutki	Millets	R	8	20	160	1000	0	0	0	0	2000	0	1500	800	800	0	40	0	-4660
23	5	5	Rice	Cereals	K	30	40	1200	1000	0	600	900	0	2000	1500	3000	1000	1000	0	50	0	-10200
24	1	1	Sesame	Nuts/Oils	K	2	75	150	1000	0	0	0	0	1000	0	1500	150	4	146	50	7300	3650
25	2	2	Sesame	Nuts/Oils	K	2	150	300	1400	0	0	0	0	2000	0	2000	300	8	292	50	14600	8900
		Mean	Masri	Pulses	R	11	71	453	1100	0	150	300	0	1667	500	2167	483	337	146	50	7300	783
26	3	3	Sesame	Nuts/Oils	K	5	100	500	1000	0	0	0	0	1000	0	2000	50	20	30	35	30	-4470
27	4	4	Sesame	Nuts/Oils	K	2	200	400	2400	0	0	0	0	500	0	2000	100	5	95	70	6650	1350
		Mean	Matri	Pulses	R	5	130	413	1475	0	38	0	0	750	0	2000	75	13	63	53	3340	-1560
28	5	5	Sesame	Nuts/Oils	K	1	100	100	1000	0	0	0	0	1000	0	2000	100	25	75	60	4500	400
29	1	1	Soyaea n	Pulses	K	20	60	1200	1000		1300	0	2000	1000	0	2000	1000	10	990	33	32670	24170
30	5	5	Soyaea n	Pulses	K	10	60	600	1500		1500	1600	1600	1500	3000	1500	500	10	490	50	24500	11700
31	1	1	Udad	Pulses	K	5	75	375	1000	0	0	0	1000	1000	0	2000	400	20	380	37	14060	8685
		Mean	Moong	Pulses	K	9	74	569	1125	0	700	400	1150	1125	750	1875	500	16	484	45	18933	11239
32	1	Mean	Peanuts	Nuts/Oils	K	30	120	3600	1000	0	0	0	500	2000	750	0	300	20	280	35	9800	1950

33	2	2	Udad	Pulses	K	4	100	400	1400	0	1300	150	200	1000	0	2000	300	15	285	35	9975	3525
34	3	3	Udad	Pulses	K	5	100	500	1000	0	0	0	0	2000	0	2000	80	30	50	45	50	-5450
		Mean	Rai	Nuts/Oils	R	12	98	1267	1131	0	500	75	100	1500	0	2000	190	23	168	40	5013	-963
35	4	4	Udad	Pulses	K	6	70	420	2400	0	0	0	500	500	0	2000	200	25	175	37	6475	655
36	5	5	Udad	Pulses	K	6	100	600	1000	0	0	0	0	2000	0	2000	200	100	100	50	5000	-600
37	4	4	Arsi	Nuts/Oils	R	1	50	50	1000	0	0	0	0	1000	0	2000	40	40	0	40	0	-4050
38	5	5	Arsi	Nuts/Oils	R	1	50	50	1000	0	0	0	0	1000	0	2000	40	40	0	40	0	-4050
39	1	1	Chana	Pulses	R	30	50	1500	1000	1200	0	450	400	2500	750	1500	200	30	170	35	5950	-3350
		Mean	Rice	Cereals	K	10	63	550	1000	300	0	113	100	1625	188	1875	120	53	68	41	2738	-3013
40	2	2	Chana	Pulses	R	50	70	3500	2800	0	1300	150	400	2000	3000	2000	500	100	400	45	18000	2850
41	3	3	Chana	Pulses	R	1	50	50	1000	0	780	350	0	1000	1000	2000	500	100	400	50	0	-6180
42	4	4	Chana	Pulses	R	50	40	2000	3600	0	1300	450	0	1200	1000	2000	500	200	300	38	11400	-150
		Mean	Sarson	Nuts/Oils	R	28	56	1525	2100	75	845	317	133	1400	1667	2000	500	133	367	44	9800	-1160
43	5	5	Chana	Pulses	R	10	50	500	1000	0	0	0	0	1000	1000	2000	100	100	0	40	0	-5500
44	2	2	Masri	Pulses	R	25	45	1125	1400	0	1300	150	0	2000	2000	1800	500	25	475	40	19000	9225
45	4	4	Masri	Pulses	R	10	40	400	3600		1300	0	0	1200	0	2000	500	50	450	35	15750	7250
46	5	5	Masri	Pulses	R	2	90	180	1000	0	0	0	0	1000	0	2000	40	40	0	35	0	-4180
47	3	3	Matri	Pulses	R	Rabi	Rabi	Rabi	Rabi	Rabi	520	210	0	1000	0	1500	400	50	350	40	0	-3230
		Mean	Sesame	Nuts/Oils	R	12	58	568	2000	0	780	72	0	1240	600	1860	308	53	255	38	6950	713
48	5	5	Matri	Pulses	R	2	50	100	1000	0	0	0	0	1000	0	2000	30	30	0	35	0	-4100
49	1	1	rai	Nuts/Oils	R	2	80	160	1000	5000	0	225	0	3000	1500	1500	200	100	100	40	4000	-8385
		Mean	Soyaea n	Pulses	K	5	63	276	1333	1667	325	113	0	2000	750	1750	115	65	50	38	2000	-6243
50	5	5	Rai	Nuts/Oils	R	3	200	600	1000	0	0	0	0	1000	2000	1000	200	150	50	20	1000	-4600
51	5	5	Ramtila	Nuts/Oils	R	3	60	180	1000	0	0	0	0	2000	0	1500	400	350	50	50	2500	-2180
5	2	2	Sarson	Nuts/Oils	R	3	100	300	2800	0	1300	75	0	2000	2000	1000	300	100	200	30	6000	-3475
56	3	3	Sarson	Nuts/Oils	R	10	200	2000	1000	1300	780	280	1200	2000	1000	2000	400	100	300	35	150000	138440
57	4	4	Sarson	Nuts/Oils	R	3	200	600	3600	0	1300	450	0	1200	2000	1000	500	200	300	35	10500	350
		Mean	Udad	Pulses	K	5	140	770	2100	325	845	161	240	1640	1400	1300	360	180	180	34	34000	25707
58	1	1	Wheat	Cereals	R	60	30	1800	1000	1200	0	450	0	3000	0	3000	800	400	400	15	6000	-4450
59	2	2	Wheat	Cereals	R	50	25	1250	2800	0	1300	275	500	2000	4000	3000	1000	300	700	18	12600	-2525
60	3	3	Wheat	Cereals	R	50	20	1000	2000	0	780	700	0	1000	1000	3000	1400	800	600	18	0	-9480
61	4	4	Wheat	Cereals	R	100	20	2000	4800	0	1300	250	0	1200	3000	3000	1000	800	200	18	3600	-11950
62	5	5	Wheat	Cereals	R	40	20	800	1000	0	0	0	0	1000	1000	2000	200	200	0	15	0	-5800
		Mean	Wheat	Cereals	R	60	21	1263	2650	0	845	335	100	1640	1800	2800	880	500	380	17	4440	-6841
63	2	Mean	Aloo	Roots/Tubers	R	100	50	5000	1000	2500	0	0	0	4000	4000	4000	1000	50	950	10	9500	-11000
64	1	Mean	baigan	Vegetables	R	1	1800	1800	1000	0	1200	450	2000 0	1500	2000	1500	4000	40	3960	12	47520	18070
		Sum				903	5660	40801	89700	11200	25980	8690	3170 0	80400	5535 0	118300	28950	1055 2	18398	2056	720925	258804
		Mean				31	192	1383	3041	400	866	290	1057	2680	1845	3943	965	352	613	69	24031	8627
		SD				22	231	872	890	781	621	274	2589	714	1184	571	607	253	552	15	25990	25106
S N	District code	District code	Food Items	Food Categories	Type K= Kharif R - Rabi Type	Land preparation and sowing				Fertilizers and plant protection				Weeding	Irriga tion	Harvestin g	Production cost					
						Quantit y of seed (Kg) per acre	Cost per unit	Cost of seeds	Sowing	FYM (Farm Yard Manur e	DAP	Urea	insec tid e s and pesti cieds	Hired labour (man days) used per acre	Irriga tion charg es	Harvestin g Charges	Total productio n	Use for Hous ehold Cons umpti on kgs	Quantit y Sold	Cost per unit (sellin g price)	Total incom e	Profit (+) / Loss(-)
1	2	2	Arhar	Pulses	K	8	50	400	1400	0	0	0	0	300	0	2000	150	45	105	40	105	-3995
2	3	3	Arhar	Pulses	K	8	50	400	1000	0	0	0	0	1000	1000	2000	200	100	100	32	100	-5300

3	4	4	Arhar	Pulses	K	20	40	800	2400	0	0	0	0	500	2000	2000	300	60	240	35	8400	700
4	5	5	Arhar	Pulses	K	2	50	100	1000	0	0	0	0	1000	1000	2000	300	300	0	50	0	-5100
		Mean	Arhar	Pulses	K	10	48	425	1450	0	0	0	0	700	1000	2000	238	126	111	39	2151	-3424
5	3	3	Arsi	Nuts/Oils	K	1	50	50	1000	0	0	0	0	1000	0	2000	40	40	0	40	0	-4050
6	2	2	Jowar	Milletts	K	10	20	200	1400	0	1300	60	200	1000	0	2000	200	60	140	15	112000	105840
7	3	3	Jowar	Milletts	K	10	20	200	1000	0	0	0	500	1000	2000	2000	200	100	100	15	80000	73300
		Mean	Arsi	Nuts/Oils	R	8	34	219	1213	0	325	15	175	1000	667	2000	147	67	80	23	64000	58363
8	3	Mean	Bajra	Milletts	K	7	18	126	1000	0	0	0	0	1000	0	2000	200	50	150	16	0	-4126
		Mean	Bajra	Milletts	K	9	23	186	1153	0	406	19	219	1000	889	2000	182	72	110	18	48000	42512
9	4	4	Jowar	Milletts	K	7	20	140	1200	0	0	0	0	500	0	2000	800	200	600	18	10800	6960
10	5	5	Jowar	Milletts	K	8	20	160	1500	0	0	0	0	500	0	2000	250	200	50	18	900	-3260
11	1	1	Moong	Pulses	K	5	35	175	1000	0	0	0	1000	1000	0	2000	200	20	180	37	6660	1485
12	2	2	Moong	Pulses	K	2	100	200	1400	0	1300	60	200	1000	0	2000	150	15	135	60	8100	1940
13	3	3	Moong	Pulses	K	8	100	800	1000	0	0	0	500	1000	3000	2000	50	10	40	45	6000	-2300
		Mean	Chana	Pulses	R	6	64	334	1225	0	325	12	340	800	600	2000	290	89	201	36	6492	965
14	5	Mean	Corn	Milletts	K	4	70	280	1000	0	0	0	0	1800	2100	2000	300	250	50	12	600	-6580
15	3	Mean	Jawa	Milletts	R	40	12	480	1000	0	260	140	0	1000	0	2000	500	100	400	15	0	-4880
16	4	4	Moong	Pulses	K	3	100	300	2400	0	0	0	500	500	0	3000	150	15	135	50	6750	50
17	2	2	Rice	Cereals	K	10	100	1000	1400	0	1300	275	500	1500	3000	2000	1000	300	700	16	11200	225
18	3	3	Rice	Cereals	K	20	15	300	1000	0	260	140	0	2000	1500	2000	1000	500	500	18	500	-6700
19	4	4	Rice	Cereals	K	5	100	500	3600	0	2400	450	500	2000	3000	2000	2000	700	1300	15	19500	5050
		Mean	Jowar	Milletts	K	10	79	525	2100	0	990	216	375	1500	1875	2250	1038	379	659	25	9488	-344
20	5	Mean	Kakun	Milletts	K	2	20	40	1500	0	0	0	0	0	0	0	30	20	10	18	180	-1360
21	5	Mean	Kodo	Milletts	R	10	30	300	1000	0	0	0	0	1500	0	1500	1000	1000	0	60	0	-4300
22	5	Mean	Kutki	Milletts	R	8	20	160	1000	0	0	0	0	2000	0	1500	800	800	0	40	0	-4660
23	5	5	Rice	Cereals	K	30	40	1200	1000	0	600	900	0	2000	1500	3000	1000	1000	0	50	0	-10200
24	1	1	Sesame	Nuts/Oils	K	2	75	150	1000	0	0	0	0	1000	0	1500	150	4	146	50	7300	3650
25	2	2	Sesame	Nuts/Oils	K	2	150	300	1400	0	0	0	0	2000	0	2000	300	8	292	50	14600	8900
		Mean	Masri	Pulses	R	11	71	453	1100	0	150	300	0	1667	500	2167	483	337	146	50	7300	783
26	3	3	Sesame	Nuts/Oils	K	5	100	500	1000	0	0	0	0	1000	0	2000	50	20	30	35	30	-4470
27	4	4	Sesame	Nuts/Oils	K	2	200	400	2400	0	0	0	0	500	0	2000	100	5	95	70	6650	1350
		Mean	Matri	Pulses	R	5	130	413	1475	0	38	0	0	750	0	2000	75	13	63	53	3340	-1560
28	5	5	Sesame	Nuts/Oils	K	1	100	100	1000	0	0	0	0	1000	0	2000	100	25	75	60	4500	400
29	1	1	Soyaea n	Pulses	K	20	60	1200	1000		1300	0	2000	1000	0	2000	1000	10	990	33	32670	24170
30	5	5	Soyaea n	Pulses	K	10	60	600	1500		1500	1600	1600	1500	3000	1500	500	10	490	50	24500	11700
31	1	1	Udad	Pulses	K	5	75	375	1000	0	0	0	1000	1000	0	2000	400	20	380	37	14060	8685
		Mean	Moong	Pulses	K	9	74	569	1125	0	700	400	1150	1125	750	1875	500	16	484	45	18933	11239
32	1	Mean	Peanuts	Nuts/Oils	K	30	120	3600	1000	0	0	0	500	2000	750	0	300	20	280	35	9800	1950
33	2	2	Udad	Pulses	K	4	100	400	1400	0	1300	150	200	1000	0	2000	300	15	285	35	9975	3525
34	3	3	Udad	Pulses	K	5	100	500	1000	0	0	0	0	2000	0	2000	80	30	50	45	50	-5450
		Mean	Rai	Nuts/Oils	R	12	98	1267	1131	0	500	75	100	1500	0	2000	190	23	168	40	5013	-963
35	4	4	Udad	Pulses	K	6	70	420	2400	0	0	0	500	500	0	2000	200	25	175	37	6475	655
36	5	5	Udad	Pulses	K	6	100	600	1000	0	0	0	0	2000	0	2000	200	100	100	50	5000	-600
37	4	4	Arsi	Nuts/Oils	R	1	50	50	1000	0	0	0	0	1000	0	2000	40	40	0	40	0	-4050
38	5	5	Arsi	Nuts/Oils	R	1	50	50	1000	0	0	0	0	1000	0	2000	40	40	0	40	0	-4050
39	1	1	Chana	Pulses	R	30	50	1500	1000	1200	0	450	400	2500	750	1500	200	30	170	35	5950	-3350
		Mean	Rice	Cereals	K	10	63	550	1000	300	0	113	100	1625	188	1875	120	53	68	41	2738	-3013
40	2	2	Chana	Pulses	R	50	70	3500	2800	0	1300	150	400	2000	3000	2000	500	100	400	45	18000	2850
41	3	3	Chana	Pulses	R	1	50	50	1000	0	780	350	0	1000	1000	2000	500	100	400	50	0	-6180
42	4	4	Chana	Pulses	R	50	40	2000	3600	0	1300	450	0	1200	1000	2000	500	200	300	38	11400	-150
		Mean	Sarson	Nuts/Oils	R	28	56	1525	2100	75	845	317	133	1400	1667	2000	500	133	367	44	9800	-1160
43	5	5	Chana	Pulses	R	10	50	500	1000	0	0	0	0	1000	1000	2000	100	100	0	40	0	-5500
44	2	2	Masri	Pulses	R	25	45	1125	1400	0	1300	150	0	2000	2000	1800	500	25	475	40	19000	9225
45	4	4	Masri	Pulses	R	10	40	400	3600		1300	0	0	1200	0	2000	500	50	450	35	15750	7250
46	5	5	Masri	Pulses	R	2	90	180	1000	0	0	0	0	1000	0	2000	40	40	0	35	0	-4180

47	3	3	Matri	Pulses	R	Rabi	Rabi	Rabi	Rabi	Rabi	520	210	0	1000	0	1500	400	50	350	40	0	-3230
		Mean	Sesame	Nuts/Oils	R	12	58	568	2000	0	780	72	0	1240	600	1860	308	53	255	38	6950	713
48	5	5	Matri	Pulses	R	2	50	100	1000	0	0	0	0	1000	0	2000	30	30	0	35	0	-4100
49	1	1	rai	Nuts/Oils	R	2	80	160	1000	5000	0	225	0	3000	1500	1500	200	100	100	40	4000	-8385
		Mean	Soyaea n	Pulses	K	5	63	276	1333	1667	325	113	0	2000	750	1750	115	65	50	38	2000	-6243
50	5	5	Rai	Nuts/Oils	R	3	200	600	1000	0	0	0	0	1000	2000	1000	200	150	50	20	1000	-4600
51	5	5	Ramtila	Nuts/Oils	R	3	60	180	1000	0	0	0	0	2000	0	1500	400	350	50	50	2500	-2180
5	2	2	Sarson	Nuts/Oils	R	3	100	300	2800	0	1300	75	0	2000	2000	1000	300	100	200	30	6000	-3475
56	3	3	Sarson	Nuts/Oils	R	10	200	2000	1000	1300	780	280	1200	2000	1000	2000	400	100	300	35	150000	138440
57	4	4	Sarson	Nuts/Oils	R	3	200	600	3600	0	1300	450	0	1200	2000	1000	500	200	300	35	10500	350
		Mean	Udad	Pulses	K	5	140	770	2100	325	845	161	240	1640	1400	1300	360	180	180	34	34000	25707
58	1	1	Wheat	Cereals	R	60	30	1800	1000	1200	0	450	0	3000	0	3000	800	400	400	15	6000	-4450
59	2	2	Wheat	Cereals	R	50	25	1250	2800	0	1300	275	500	2000	4000	3000	1000	300	700	18	12600	-2525
60	3	3	Wheat	Cereals	R	50	20	1000	2000	0	780	700	0	1000	1000	3000	1400	800	600	18	0	-9480
61	4	4	Wheat	Cereals	R	100	20	2000	4800	0	1300	250	0	1200	3000	3000	1000	800	200	18	3600	-11950
62	5	5	Wheat	Cereals	R	40	20	800	1000	0	0	0	0	1000	1000	2000	200	200	0	15	0	-5800
		Mean	Wheat	Cereals	R	60	21	1263	2650	0	845	335	100	1640	1800	2800	880	500	380	17	4440	-6841
63	2	Mean	Aloo	Roots/Tubers	R	100	50	5000	1000	2500	0	0	0	4000	4000	4000	1000	50	950	10	9500	-11000
64	1	Mean	baigan	Vegetables	R	1	1800	1800	1000	0	1200	450	2000 0	1500	2000	1500	4000	40	3960	12	47520	18070
		Sum				903	5660	40801	89700	11200	25980	8690	3170 0	80400	5535 0	118300	28950	1055 2	18398	2056	720925	258804
		Mean				31	192	1383	3041	400	866	290	1057	2680	1845	3943	965	352	613	69	24031	8627
		SD				22	231	872	890	781	621	274	2589	714	1184	571	607	253	552	15	25990	25106

Annexure 11 – The global nutrition targets as adopted by WHO related to Under nutrition

Maternal, infant and young child nutrition (MIYCN) targets	
TARGET 1	Achieve a 40% reduction in the number of children under 5 who are stunted
Under-5 STUNTING	 Stunting* among children under 5 years of age
TARGET 2	Achieve a 50% reduction of anaemia in women of reproductive age
ANAEMIA	 Women aged 15–49 years with haemoglobin <12 g/dL (non-pregnant) or <11 g/dL (pregnant)
TARGET 3	Achieve a 30% reduction in low birth weight
LOW BIRTH WEIGHT	 Infants born with a birth weight <2,500 g
TARGET 4	Ensure that there is no increase in childhood overweight
Under-5 OVERWEIGHT	 Overweight** among children under 5 years of age
TARGET 5	Increase the rate of exclusive breastfeeding in the first 6 months up to at least 50%
EXCLUSIVE BREASTFEEDING	 Infants 0–5 months of age who are fed exclusively with breast milk
Goal 2. End hunger, achieve food security and improved nutrition and promote sustainable agriculture	
TARGET 2.2	By 2030, end all forms of malnutrition, including achieving, by 2025, the internationally agreed targets on stunting and wasting in children under 5 years of age, and address the nutritional needs of adolescent girls, pregnant and lactating women and older persons
Under-5 STUNTING	 2.2.1 Prevalence of stunting among children under 5 years of age
Under-5 WASTING	
Under-5 OVERWEIGHT	 2.2.2 Prevalence of wasting and overweight among children under 5 years of age

Annexure 12 : Income Generation Sheet

Daily wage income										
Districts	All HHs			Income from wages per hh/Annum		Income from wages All HHs/Annum			Mean income	
	Total	Migrate	Do not migrate	Migrate	Do not migrate	Migrate	Do not migrate	All Households (50) income / Annum	Average income per household/ Annum	Average income per household/ Month
Niwari	50	18	33	12000	36000	210000	1170000	1380000	27600	2300
Panna	50	38	13	12000	36000	450000	450000	900000	18000	1500
Rewa	50	21	29	12000	36000	252000	1044000	1296000	25920	2160
Satna	50	20	30	12000	36000	240000	1080000	1320000	26400	2200
Umaria	50	18	33	12000	36000	210000	1170000	1380000	27600	2300
Total	250	114	137	60000	180000	1362000	4914000	6276000	25104	2092
Mean	50	23	27	12000	36000	272400	982800	1255200	25104	2092
SD	0	8	8	0	0	100989	302967	201978	4040	337
Migration income										
Districts	All HHs			Income from Migration per hh/Annum		Income from Migration All HHs/Annum			Mean income	
	Total	Migrate	Do not migrate	Migrate	Do not migrate	Migrate	Do not migrate	All Households (50) income / Annum	Average income per household/ Annum	Average income per household/ Month
Niwari	50	18	33	48000	36000	840000	1170000	2010000	40200	3350
Panna	50	38	13	42000	36000	1575000	450000	2025000	40500	3375
Rewa	50	21	29	48000	36000	1008000	1044000	2052000	41040	3420
Satna	50	20	30	45000	36000	900000	1080000	1980000	39600	3300
Umaria	50	18	33	51000	36000	892500	1170000	2062500	41250	3438
Total	250	114	137	46800	180000	5215500	4914000	10129500	40518	3377
Mean	50	23	27	46800	36000	1043100	982800	2025900	40518	3377
SD	0	8	8	3421	0	303545	302967	33095	662	55

Annexure 13 – NTFP in Madhya Pradesh

Madhya Pradesh in central India accounts for about 7.8% of the country's population and 10.75% of its forest and tree cover. It is the state with the highest forest and tree cover in the country, which is 83,629 square kilometres or 27.14% of the state's geographical area (FSI, 2003). It is also the largest producer of both timber and NTFPs. It is estimated that around a quarter of the state's population, mainly

Scheduled Tribes and other weaker sections of the society, depends on NTFPs for at least part of their livelihood (Kumar, 2003). In the forest fringe areas, NTFPs contribute up to 70% of household income (ICCF, 2005).

Large quantities of NTFPs are traded in *mandis* (markets) in different parts of the state. Estimates available for one *mandi* (Katni) indicate that 60,000 tonnes of NTFPs worth Rs 66.8 million are traded annually in only that *mandi*. The annual value of top ten commercial NTFPs in the state is estimated to be Rs 3.13 billion (Bhattacharya, 2004). In Madhya Pradesh, tendu leaves and sal seeds are nationalized whereas bamboo is treated as a special category of timber.⁵

Madhya Pradesh has about 12% of the country's growing stock of bamboo. *Dendrocalamus strictus* is the most common bamboo species in the state. Twelve districts have been identified as bamboo growing areas. In these districts, farmers growing bamboo on their fields have to register with FD. Such registration is not required in other districts.

Madhya Pradesh is the largest producer of tendu leaves in the country, accounting for 58.01% of the country's total production. The production of leaves between 2003 and 2005 was 2.225 million, 2.576 million and 1.68 million standard bags, respectively. Tendu leaves are the most important NTFP in the state from the commercial as well as rural income perspective. Six million people are involved in tendu leaf collection in the state. The total turnover of the tendu trade (collection and rolling) in the state is estimated to be around Rs 1.845 billion. Initially, the leaves were sold un-plucked to the contractors, who got these collected by employing local people (usually Scheduled Tribes) as labourers. The government felt that the contractors were cheating both the government (by over harvesting) and the labourers (by under paying).

Therefore, in 1964 the state government nationalized the trade in tendu leaves (Lal and Dave, 1991). After nationalisation, government appointed agents collected and delivered the produce to buyers. However, there was often collusion between the two resulting in underreporting of produce collected and consequent loss of revenue to the government. Therefore, the government shifted to the lump-sum payment system in 1980 (Lal and Dave, 1991). This addressed the issue of government's revenue loss to some extent but the problem of exploitation of the leaf collectors by the agents still remained. In order to address this issue, government decided to promote cooperatives of leaf collectors. It created the Madhya Pradesh Minor Forest Produce Cooperative Federation (MPMFPCF) in 1984 and developed a three-tier structure consisting of the federation at the state level, district unions at the forest division level, and primary cooperatives at the field level (Prasad, 2004). The total production of mahua flowers and seeds in the state is estimated to be 53,600 quintals. Mahua was nationalized in 1969 but control on mahua trade was soon removed (Marothia, 1996). There has been a major spurt in mahua liquor production after the state government allowed brewing of up to five litres of mahua liquor. Chindwara, Chattarpur, and Siddhi are important mahua producing districts of the state (Table 2.1).

Table 2.1 : Data of Tendu Leaves Trade

Year	Collection	Collection Rate per S.B	Collection Wages	Quantity Stored	Quantity disposed off	Sale Price	Expenditure	Net receipt
1989	43.61	150	65.42	43.58	43.58	405.15	114.70	290.45
1990	61.15	250	152.88	60.57	60.57	248.47	209.12	39.35
1991	46.16	250	115.40	45.79	45.79	298.07	180.00	118.07

1992	45.06	250	112.65	44.64	44.64	285.99	201.47	84.52
1993	41.31	300	123.93	40.98	40.98	252.77	198.29	54.48
1994	42.38	300	127.14	42.08	42.08	299.40	210.95	88.45
1995	39.56	300	118.68	39.36	39.36	289.39	197.80	91.59
1996	44.60	350	156.10	44.43	44.43	338.85	269.38	69.47
1997	40.14	350	140.49	39.95	39.95	338.69	244.05	94.64
1998	45.47	400	181.84	45.23	45.23	407.66	280.39	127.27
1999	49.37	400	194.20	49.12	49.12	402.20	283.87	118.33
2000	29.59	400	114.78	29.49	29.49	176.31	160.08	16.23
2001	21.28	400	83.09	21.22	21.22	111.05	136.07	-
2002	22.74	400	89.04	22.65	22.65	165.77	143.83	21.94
2003	22.25	400	87.56	22.21	22.21	152.95	140.71	12.24
2004	25.77	400	101.61	25.72	25.72	167.71	145.86	21.85
2005	16.83	400	66.37	16.82	16.82	131.41	106.90	24.51
2006	17.97	400	71.88	17.97	17.97	151.33	100.56	50.77
2007	24.21	450	108.95	24.21	24.21	373.64	136.89	236.75
2008	18.25	550	100.35	18.25	18.25	211.26	136.57	74.69
2009	20.49	550	112.67	20.49	20.49	265.49	149.86	115.63
2010	21.24	650	138.11	21.24	21.24	332.89	179.71	153.18
2011	17.06	650	110.85	17.06	17.06	310.06	154.10	155.96
2012	26.06	750	195.45	26.06	26.06	618.40	245.94	372.56
2013	19.92	950	189.28	19.92	19.92	394.81	247.04	147.77
2014	16.99	950	161.42	16.99	16.99	310.09	217.39	92.70
2015*	16.05	950	152.47	16.05	16.05	329.27	183.19	-

Source : MP Federation website

Note * Figures for 2015 season are to be finalized

1) Quantity: In lakh Standard Bags (1 Standard Bag=50,000 leaves);
2) Amount: In Rs. Crores.

The total production of tamarind in the state is around 1,200 quintals. Siddhi and Chindwara are important tamarind producing districts. Sal forests occupy about 16.5 % of the total forest area of the state and are mainly confined to the districts of Jabalpur, Mandla, Dindori, Shahdol, Sidhi, Rewa, Chhindwara, Balaghat and Hoshangabad. Sal seeds are a nationalised NTFP and their procurement and disposal is handled by MPMFPCF. Before the division of the state⁷, the annual sal seed production was 347,645 quintals.⁸ It fell to 12,060 quintals in 2001 after the division of the state. It further fell to 6,273 quintals in 2002. The collection fell drastically in 2003 (709 quintals) and 2004 (570 quintals) before picking up somewhat in 2005 (3,834 quintals). In 2007, the collection of sal seeds was banned for five years. In 2000, over Rs 111 million were paid as collection wages to the collectors. This amount had come down to just over Rs 1 million in 2005.

Like Andhra Pradesh, Madhya Pradesh has also initiated a JFM programme. However, unlike most other states that have restricted JFM to degraded forests, it has extended JFM programme to dense forests as well. Several activities under JFM, including those related to NTFPs, were initially supported through a World Bank-funded project. Apart from the World Bank project, FD invested about Rs 150 million in the development of bamboo resources and bamboo handicrafts through Swarna Jayanti Gramin Swarojgar Yojna, a national rural self-employment scheme. Efforts regarding NTFP enterprise development are also being made through DFID's Poorest Areas Civil Society Programme (PACS) and Madhya Pradesh Rural

Livelihoods Project (MPRLP), and the World Bank's District Poverty Initiative Project (DPIP). The field sites for study were selected based on the potential for development of different NTFP based enterprises. These included Sheopur in the north, Mandla and Seoni in the east, Betul in the south and Bhopal in the central region of the state. The study was conducted through interviews with key informants in FD, MPMFPCF, Madhya Pradesh Rural Livelihoods Project, Panchayati Raj Institutions (PRIs)⁹, State Forest Research Institute, Non-Government Organisations (NGOs) involved in NTFP enterprises, NTFP traders, primary NTFP collectors and other community members. These interviews were supplemented through an analysis of different NTFP-related policies, review of secondary literature and perusal of official records.

In addition to Nationalised Non wood Forest Products namely Tendu Leaves, Chebulic myrobolan or Harra, Sal Seed and Gums, a number of very important and valuable non-nationalised Non wood Forest Products like Mahua Aonla, Chirota, Neem, Mahul Patta, Chironji, Honey, Tamarind etc. are also found in the forests of Madhya Pradesh. The villagers are free to collect and sell these produce. Generally, after meeting their own requirements, the villagers sell the balance quantity to small local traders or middlemen at very low rates. These middlemen, in turn, earn huge profits from these produce. Therefore, with a view to save these villagers from the exploitation by the middlemen, the collection of these Non wood Forest Products was started through Primary Forest Produce Cooperative Societies from 1995-96. Primary Societies purchase these produce from the villagers and later on sell the collected produce in bigger markets. All the decisions regarding the quantity and rate of purchase and sale are taken by the elected officials of the Primary Cooperative Societies and District Unions. The forest officials give all necessary help and guidance to them. The Federation gathers information regarding the market price and supply conditions and transfers this information to the District unions, so that the produce collected by the societies can be conveniently sold at remunerative prices. In year 1998-99 about 12,188.60 Qntls. of Non-nationalised NWFP was collected through the Primary Societies (M.P. Federation website). The details of item wise quantity collected is given in the table 2.2 below

Table 2.2 : Details of NTFP

S.No.	Name of the NWFP			Quantity (in Qntls)
	Local	English	Botanical	
1	Achar-guthli	Chironji	Buchanania lanzan	466.00
2	Aonla	Indian Gooseberry	Phyllanthus emblica	5,692.00

3	Aonla(Dry)	Indian Goosebery	Phyllanthus emblica	15.00
4	Baheda	Belliric Myrobalan	Terminalia bellerica	264.00
5	Chirota Seed		Cassia tora	404.00
A	Honey	Honey		6.00
B	Imli	Tamarind	Tamarindus indica	150.00
C	Mahua flower		Madhuca indica	1,555.00
6	Mahua Gulli	Mahua	Madhuca indica	20.00
7	Mahul Patta	Mahul Patta	Bauhinia vahlii	2,675.00
8	Safed Musli	Safed Musli	Chlorophytum tuberosum	4.00
9	Nagarmotha Roots	Motha	Cyperus rotundus	51.00
10	Satawar	Wild Shatawar	Asparagus racemosus	28.60
11	Others			858.00
Total				12,188.60
Source : Madhya Pradesh federation website				

District Unions and Primary Societies have been authorized for the disposal of these items. Action has also been initiated to enroll the primary societies as members of the National Federation of Cooperatives working under the Ministry of welfare, Government of India, so that they can get working capital and share capital to conduct trade in these NWFPs more efficiently.