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REPORT ON INDIVIDUAL DIETARY DIVERSITY SCORE SURVEY

The Individual Dietary Diversity Score (IDDS) reflects the macro and micronutrient adequacy of the diet on a daily platter.

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Executive Summary

Nutrition and dietary diversity are critical global issues and challenges. The poor nutritional status of the communities should be addressed as soon as possible to achieve human and socio-economic development. Without knowing the food and dietary gaps of the communities, any progress can be hardly made. The main objective of the survey was to assess the individual dietary diversity of the communities living in the area.

The key summary of the findings from this survey showed that –

- Only (22%) of the respondents are reaching a diverse diet (consuming 5 or more food groups out of 10) among the pregnant, lactating women, women of reproductive age, and adolescent girls. The segregated percentage was 23% from Bihar and 22% from Madhya Pradesh.
- For children aged 6-23 months, the average dietary diversity score is 21% (consuming 4 or more food groups out of 7) among which Madhya Pradesh is 19% and Bihar with 24%.
- Looking at the foods consumed, the most commonly consumed food groups were Grains, white roots and tubers, plantains (89%), Other vegetables (45%), Pulses (29%), Dark green vegetables (20%), and Dairy (14%).
- On the other hand, the most under-consumed food groups were Meat & Fish (3%), Nuts and seeds (8%), Eggs (2%), vitamin–A-rich vegetables or roots (8%), and other fruits (6%).
- The low dietary diversity was observed among the pregnant women as compared to another group of respondents.
- 85% of the respondents are receiving safe drinking water which MP remains (78%) and BR (100%), the remaining 15% (from MP) require some kind of processing for making the water drinkable.

Therefore, it is recommended to improve the dietary diversity of the poorest ones and also of pregnant women who showed to have low dietary diversity. The food groups missing in the diets across the studied areas were identified, and this essential information will guide the project implementation to improve dietary diversity more precisely. Other useful findings, conclusions, and recommendations are also present in the report.

Introduction

Without a balanced diet and adequate nutrition, humans cannot achieve their full physical and intellectual potential. Malnutrition is responsible for more illnesses and health problems than any other cause, and the burden of malnutrition across the world remains unacceptably high (Development Initiatives, 2018). Globally, stunting among children has slightly declined, but there is new evidence that after a prolonged declining trend, there is a reversal rise in world hunger (FAO, IFAD, UNICEF, WFP, and WHO, 2018). A balanced and diverse diet is a foundation of human health, and it has been identified as an essential driver of sustainable development. Therefore, improving diets and ending all forms of malnutrition by 2030 is one of the SDG targets. Practically, when people diversify their diets, and their nutritional status improves, it helps break the inter-generational cycle of poverty and leads to a myriad of benefits and socio-economic growth for individuals, families, communities, societies, and countries. In biodiverse regions, inadequate food intake of Indigenous peoples is often a result of limited knowledge on nutrition, health, and food biodiversity.

The 2019-21 National Family Health Survey of Madhya Pradesh undertaken by the Ministry of Health and Family Welfare showed that many children in Madhya Pradesh do not receive the required nutrients already in their mother's womb. It also found that amongst young children (6-23 months), only 9.2% have an adequate diet. Among children below 5 years, 19% suffer from wasting, or being too thin for their height, which may result from inadequate recent food intake or a recent illness-causing weight loss, and 6.5% are severely wasted. 33% are found underweight which takes into account both chronic and acute undernutrition. Anemia is also a significant concern amongst children in the age group of 6-59 months with 72.7%, women of reproductive age with 54.7%, and pregnant women with 52.9%. Women whose Body Mass Index (BMI) is below normal (BMI<18.5 kg/m) is 23%. Similarly, in Bihar state, 10.8% of children (6-23 months) have an adequate diet. Among children below 5 years, 22.9 % suffer from wasting, 8.8% are severely wasted, and 41% are found underweight. Anemia is also a significant concern amongst children in the age group of 6-59 months with 69.4%, women of reproductive age with 63.5%, and pregnant women with 63.1%. Women whose Body Mass Index (BMI) is below normal (BMI<18.5 kg/m) is 25.6%. Hence, there is not a major difference between the states of Madhya Pradesh and Bihar.

Background

The Indigenous food systems of the region should be therefore revitalized, diversified, and promoted for the all food and nutrition security of the communities. VSS, stepping forward through implementing the project for strengthening indigenous food systems to improve nutrition and increase the livelihood of indigenous communities of Madhya Pradesh and Bihar with a special focus on children, youth, adolescent girls, women's groups, and community. The team is focusing more on improving the production and productivity of local food systems, by embracing innovations for local livelihood opportunities, and by encouraging higher consumption of micronutrient-rich local foods. The nutrition component is one of the key project pillars and strategic interventions. Dietary diversity has been selected as an indicator for guiding evidence-based intervention and for measuring the project impact. The strength of this tool is the simplicity and thus not only its use within monitoring and evidence generation for participatory-results sharing of the survey results.

The tdh project seeks to gain a keen understanding of actual malnutrition. It seeks to recognize the real needs of the direct target audience segments and looks for data so that evidence-based advocacy can be effectively advanced. Recognizing that dietary diversity scores have been validated for several age/sex groups as proxy measures for macro and/or micronutrient adequacy of the diet, the project envisages determining the Individual Dietary Diversity Score (IDDS). It may be stated here that the term Minimum Dietary Diversity for Women (MDD-W), having replaced the term IDDS, shall hereinafter be used under the envisaged study. For the study, this target segment shall be further addressed in terms of adolescent girls (15-19 years), non-pregnant women (19-49 years), pregnant women (15-49 years), breastfeeding mothers (15-49 years), and their children (6-23 months).

Further, since the dietary diversity scores have also been positively correlated with adequate micronutrient density of complementary foods for infants and young children, and macronutrient and micronutrient adequacy of the diet for non-breastfed children, children of 6-23 months shall also comprise a target audience in this study. Thus, the scores on Minimum Dietary Diversity for Children (MDD-C) and Minimum Meal Frequency (MMF) shall be determined during the survey. The twin scores shall lead to the composite score, known as Minimum Acceptable Diet (MAD).

Recommended Dietary Allowance (RDA): Basic Concept

Humans need a wide range of nutrients to lead a healthy and active life. The amount of each nutrient needed for an individual depends on age, body weight, physical activity, physiological state (pregnancy, lactation), etc. So basically, the requirement for nutrients varies from individual to individual.

So, the term "Nutrient Requirement" analyzed in the individual dietary diversity score study is the requirement for a particular nutrient in the minimum amount that needs to be consumed to prevent symptoms of deficiency and to maintain a satisfactory level of the nutrient in the body.For example, in the case of 6 to 23 months of children, the requirement may be equated with the amount that will maintain a satisfactory rate for their growth and development. Similarly for an adult, the nutrient requirement is the amount that will maintain body weight and prevent the depletion of the nutrient from the body which otherwise may lead to deficiency. In physiological conditions like pregnancy and lactation, adult women may need additional nutrients to meet the demand of fetal growth along with their own nutrient needs.

So, RDA's help us plan balanced diets which include a variety of foods derived from the intake of diverse food groups which help meet the nutrient requirements.

Objectives of the survey

- To determine individual dietary diversity and to identify food groups included less/missing in the diet
- To document the average diversity of foods consumed

Outcome Indicator - % of Minimum Dietary Diversity for women who ate foods from ≥ 5 food groups the previous day or night

MDD-W is a dichotomous indicator of whether or not women 15-49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15–49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, one important dimension of diet quality. MDD-W can be generated from population-based surveys.

Methodology

Development and testing of the survey tool

- Study guidelines, tools, and designs were prepared by Mr. Gurusharan Sachdev, an external expert for conducting the survey.
- The guideline and tools were translated into the local language for ease of understanding by the field team.
- Volunteers from six districts were hired for conducting the survey.
- The team of volunteers and project were oriented on the tool which was further designed in the Kobo Collect tool.
- Pre-testing of the survey form was done by the volunteers covering 10 households in their village. Based on the feedback and analysis of the pre-testing survey changes were made in the form.
- The finalized questionnaires were shared with the volunteers for collecting data related to individual dietary diversity.
- During the survey spot and back-check were done by the Community Mobilizers and District Coordinators for immediate feedback and improvement.

Designing of the questionnaire

A dietary diversity questionnaire was developed for consideration by the Food and Agriculture Organization of the United Nations. Dietary diversity is a qualitative measure of food consumption that reflects individual access to a variety of foods and is also a proxy for nutrient adequacy of the diet of individuals. The dietary diversity questionnaire represents a rapid, user-friendly, and easily administered low-cost assessment tool. Participants were interviewed using 24-h recall method. The food items were classified into 16 different food groups, and later on, 16 different food groups were combined into 10 mutually exclusive food groups.

Adequate dietary diversity for adults has been defined as IDDS score ≥5 food groups, based on data distribution in our findings.

Study area and Sample Size

The exercise was undertaken by the locally hired volunteers under the supportive supervision of the Community Mobilizers and District Coordinators. Around 5% of the population in each sub-target segment, i.e., 280 adolescent girls, women of reproductive age of 15-49 years, pregnant women, and breastfeeding mothers and children aged 6 months to 23 months will be assessed across the tdh project intervention area.

Approximately 1400 persons will be randomly selected from amongst the target groups across 140 villages from 6 districts (4 districts from Madhya Pradesh including Panna, Satna, Rewa, and Umariya, and 2 districts from Bihar namely Jehanabad and Sitamarhi). A total of 2700 households was planned in the proposal, however, as per the suggestion of the external expert, the survey was conducted with fewer respondents (1400) as it may not affect the impact result of the survey findings.

Study Frame Matrix

S. No.	Target Segment	Study Dimension	Total Sample Population	Madhya Pradesh (100 Villages: 25 from each of 4 Districts)	Bihar (40 Villages (20 from each of 2 Districts)
1	Adolescent Girls (15-19 Years)	MDD-W	280	200	80
2	Non-Pregnant Women (19-49 Years)	MDD-W	280	200	80
3	Pregnant Women (15-49 Years)	MDD-W	280	200	80
4	Lactating Mothers (15-49 Years)	MDD-W	280	200	80
5	Children 6-23 Months - Both for Breastfed & Non-Breastfed	MAD based on MDD and MMF	280	200	80
	Total		**1400**	**1000**	**400**

In the nutshell, the following shall comprise the per village sample size for each of the target audiences across the 140 experiment villages:

S. No.	Audience-segment	Madhya Pradesh	Bihar	Total
1	Adolescent Girls (15-19 Years)	2	2	4
2	Non-Pregnant Women (19-49 Years)	2	2	4
3	Pregnant Women (15-49 Years)	2	2	4
4	Lactating Mothers (15-49 Years)	2	2	4
5	Children (6-23 Months): Both for Breastfed and Non-Breastfed	2	2	4
	Total	**10**	**10**	**20**

VSS wants to mention here that the study for both the Lactating Mothers of children of age 6 months to 23 months (whether being currently breastfed or not) shall be undertaken in one single visit.

Qualitative 24h-food recalls for measuring dietary diversity

The dietary diversity score is a validated proxy indicator of dietary adequacy (FAO and FHI, 2016). Different foods and food groups are good sources for various macro-and micronutrients, meaning the more food groups consumed, the better the micronutrient adequacy (Kennedy et al. 2007). A food group is defined as a group of food items that have similar caloric and nutrient content. The method needed to obtain data on dietary diversity is called qualitative 24hour food recall. A 24-hour food recall is a structured interview conducted to capture detailed information about all foods and beverages consumed by a respondent in the past 24 hours, from yesterday morning after waking up until night when the person went to sleep. The open recall method was used for recalling the foods consumed. The 24hour food recalls were conducted after ordinary days, i.e. if the previous day was an unusual day such as a celebration, ceremony, or when the person was sick the food recall was not conducted with that person.

Data handling and analysis

The primary data collected in the field were transcribed from the Kobo Collect tool into Excel working sheets. Subsequently, the first data cleaning and cross-checking process were conducted. Afterward, the analysis started by categorizing all the food items consumed. After the data cleaning and cross-checking, all the foods captured by 24-hour food recalls were finally categorized into the standard food groups. Then the dietary diversity (DD) of individual respondents (the number of food groups consumed) was determined. Importantly, also the proportion of respondents reaching the minimum dietary diversity for women (MDD-W) was calculated, where the cut-off for a balanced diet was 5 or more food groups out of 10 possible groups (FAO and FHI, 2016). Although the MDD-W cut-off 5 is validated for women of reproductive age. Lastly, the proportions of respondents consuming particular food groups were counted and compared. Although the food recalls captured the consumption of condiments, the food group of "Condiments" itself was not considered in the total food group count as it does not belong to the 10 standard groups. Condiments are normally excluded as they are eaten in a tiny quantity of less than 15 grams per food. In the present survey, also other food items consumed in an amount less than 15 grams were not counted as any food group (e.g. chutneys). The data were handled and analyzed in Microsoft Excel, foremost via pivot tables, filters, and functions. The descriptive statistics were performed, and the results were interpreted numerically and graphically by tables and different chart types. In case of some missing data for any variable, the respondent was excluded from the analysis of that particular variable, and the results were calculated using percentages.

Key Results and Findings

Dietary diversity in the overall project area –

When considering the total sample for the pregnant, lactating, women of reproductive age, and adolescent girls, the average dietary diversity score is 22%, meaning that a person in the project area consumes on average slightly over 3 food groups per day. Looking further at the recommended minimum dietary diversity, it became clear that nearly three-quarters of the respondents are not reaching it.

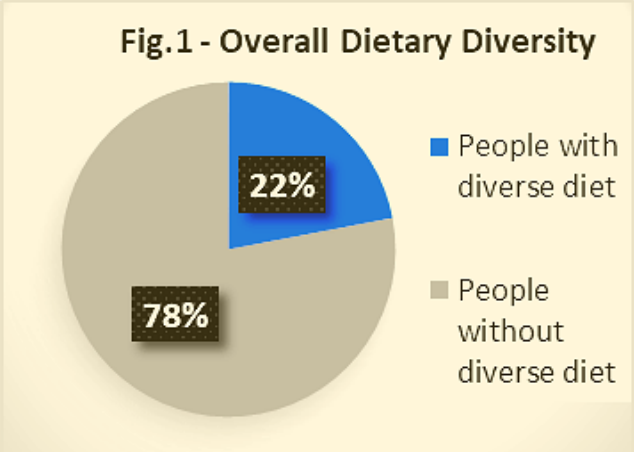
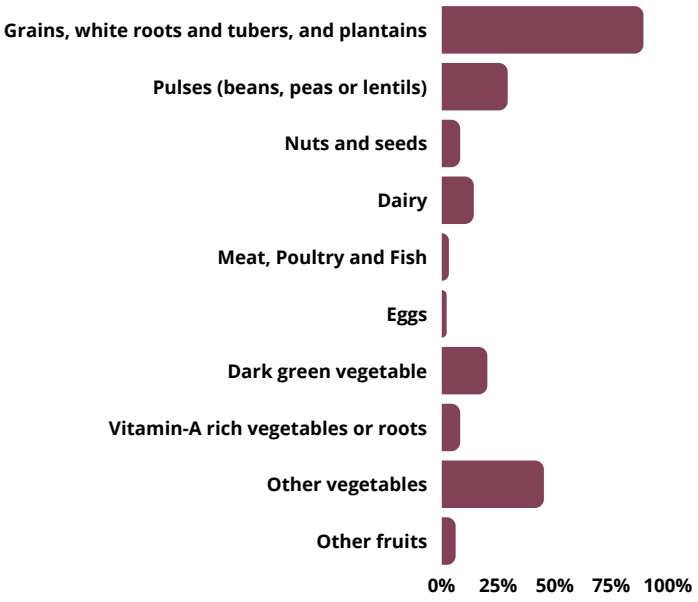


Fig.1 - Avg. of 24 hrs recall

Food Groups	Starchy Staples	Pulses and legumes	Nuts and seeds	Dairy	Meat, Poultry, and Fish	Eggs	Dark green vegetable	Vitamin-A rich food	Other vegetables	Other fruits	Avg. total
(5 -7 am)	69%	3%	7%	8%	0%	1%	2%	0%	2%	5%	**10%**
(7-9 am)	86%	39%	10%	19%	2%	1%	21%	9%	47%	6%	**24%**
(11-12 am)	98%	53%	6%	15%	3%	1%	27%	12%	56%	8%	**28%**
(1-2 am)	94%	42%	14%	10%	2%	3%	24%	9%	60%	7%	**27%**
(4-6 pm)	88%	23%	10%	13%	2%	2%	21%	8%	40%	7%	**22%**
(7-10 pm)	99%	13%	3%	19%	8%	4%	27%	8%	65%	2%	**25%**
Avg. total	**89%**	**29%**	**8%**	**14%**	**3%**	**2%**	**20%**	**8%**	**45%**	**6%**	**22%**

Fig.2 Food groups consumption -



demonstrates that the most consumed food groups are Starchy staples (89%), and Other vegetables (45%). Also, Pulses (29%). are consumed only by less than around one-third of the respondents. Dairy (14%), and Dark green vegetables (20%). On the contrary, the most under-consumed food groups are Nuts and seeds (8%), Vitamin-A rich fruit, and veg. (8%) and other fruits (6%), Meat (3%) and Eggs (2%).

Table 1: Food groups consumed by different groups (respondent)

Table – 1 Food Groups	PW	LW	WRA	AG
Grains, white roots and tubers, and plantains	86%	90%	91%	93%
Pulses (beans, peas, or lentils)	28%	27%	30%	31%
Nuts and seeds	10%	7%	8%	8%
Dairy	16%	12%	14%	14%
Meat, Poultry, and Fish	3%	3%	3%	2%
Eggs	2%	2%	1%	2%
Dark green vegetable	20%	21%	21%	20%
Vitamin-A rich vegetables or roots	8%	7%	6%	8%
Other vegetables	45%	45%	47%	43%
Other fruits	6%	3%	4%	8%

The below table shows the depiction of food groups among different types of respondents taken in the survey. Results show adequate intake is for grains (starchy staples), the rest all the food groups are marginalized (below 30%). The MDD-W was mostly lower than the five food groups consumed by women in all districts of Bihar and Madhya Pradesh. When using a mean MDD-W of five or fewer food groups to define poor dietary intake and food insecurity, results revealed that 78% of women in the study sites had failed to achieve the minimum, and are hence more likely to have inadequate micronutrient intake which increases their vulnerability to food insecurity. Among all the categories of the respondent, the minimum dietary diversity was observed as less intake in the pregnant women who remains to be the most vulnerable group.

Table 2: Food groups consumed by >50% women – District-wise

Table – 2 Food Groups	Umaria	Panna	Rewa	Satna	Jehanabad	Sitamarhi	Total
Grains, white roots and tubers, and plantains	81%	86%	89%	80%	94%	83%	**89%**
Pulses (beans, peas, or lentils)	38%	30%	23%	23%	23%	35%	**29%**
Nuts and seeds	5%	18%	10%	6%	4%	10%	**8%**
Dairy	19%	24%	14%	14%	10%	12%	**14%**
Meat, Poultry, and Fish	1%	1%	1%	1%	7%	6%	**3%**
Eggs	2%	1%	0%	1%	3%	3%	**2%**
Dark green vegetable	22%	12%	20%	14%	28%	30%	**20%**
Vitamin-A rich vegetables or roots	20%	4%	2%	13%	3%	6%	**8%**
Other vegetables	40%	49%	44%	38%	36%	59%	**45%**
Other fruits	22%	5%	4%	3%	4%	8%	**6%**

The above table shows, that in each district the situation remains the same of the adequate intake of staple foods only (highlighted) while the remaining other food groups consumed are less than 50%.

- Nutritive lens -

From the above table and graph, the adequate intake is more on the starchy staples or grains, hence the energy contribution in the daily recommended diet remains high at (89%). However, due to the less intake of other food groups lacks the micronutrient of protein, vitamins, minerals, calcium, potassium, carbohydrate, etc.

Comparison from Baseline survey

While comparing with the baseline study, the availability of food grains and vegetables per household was calculated with a family size of 6 persons on average. Maximum only 3 food groups are observed in their regular food plate as their daily consumption. 93% of the families were observed to be non-vegetarian, however, it was observed as less consumption (3%) during the IDSS study.

Food Groups	Grains	Pulses	Oil	Green leafy and another veg.	Potato & root veg.	Egg	Fish / Meat
Per day	2 kg	0.4 kg	0.2 ltr	1.3 kg	0.5 kg	7 nos.	1 kg
Per month	77 kg	6.1 kg	4.8 ltr	11.28 kg	11.52 kgs	20 nos.	4.8 kgs

The baseline finding also reveals the sources of vegetables to analyze the poor diversified dietary intake as per the below table -

Sources	Panna	Satna	Rewa	Umaria	Jehanabad	Sitamadhi
Kitchen Garden	121 (37%)	244 (82%)	194 (62%)	124 (51%)	144 (62%)	99 (40%)
Market	201 (62%)	294 (99%)	210 (67%)	237 (98%)	230 (99%)	244 (98%)
Forest	28 (9%)	40 (14%)	7 (2%)	52 (22%)	6 (3%)	0
Other	35 (11%)	28 (9%)	42 (13%)	0	0	0

A positive result came out that around 56% of the HH use a kitchen garden hence acceptability is not a major issue, Hence, to reduce the cost of purchasing the vegetables from the market which is observed high as (87%) the kitchen garden should be promoted more for reducing the expenditure of the families.

Around 18% of households cover under Antyoday Anna Yojna (AAY) and 64% are under the priority category households (PH). Although, this helps the families to reduce the cost of purchasing rice and wheat to some extent from the market. Due to this subsidized public distribution of food, the IDDS survey reveals a high percentage (89%) of the starchy food group. The existing PDS system may be largely responsible for the lack of dietary diversity.

Comparison with NFHS -5 (2019-2021) –

Percent distribution of women aged 15-49 by daily consumption of specific foods was also observed for comparing the findings. A gap was observed as shown in the below table -

State	Madhya Pradesh		Bihar		Total	
Food Groups	**NFHS-5**	**IDDS**	**NFHS-5**	**IDDS**	**NFHS-5**	**IDDS**
Milk or curd	39.5	18%	44.6	11%	42.05	14%
Pulses or beans	53.7	28%	70.1	29%	61.9	29%
Dark Green Leafy vegetables	58.6	17%	62.8	29%	60.7	20%
Fruits	8.8	9%	6.5	6%	7.65	5%
Eggs	1	1%	1.6	3%	1.3	2%
Fish / chicken / meat	0.6	1%	1.8	7%	1.2	3%
Fried foods	3.7	31%	2.9	31%	3.3	31%
Aerated drink	3.2	59%	3.2	66%	3.2	61%

NFHS -5 has shown a high percentage for all the six food groups (common food groups under NFHS & IDDS) taken for the survey while the IDDS shows less consumption. Whereas, the unhealthy food group of “Fried foods” and “Aerated drinks” are reported as less intake in NFHS – 5.

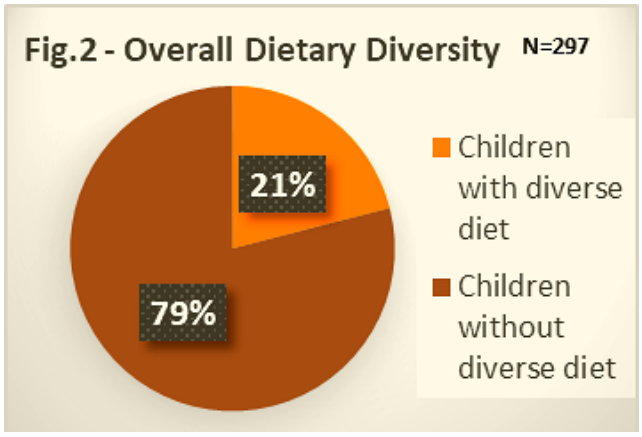
Minimum Dietary Diversity for Children (MDD-C)

For calculating the dietary score for the children aged 6 to 23 months the seven food groups were considered, the foods groups which are used for tabulation of this indicator are:

1. Grains, Roots, and Tubers: Foods made from grains or roots, including porridge or gruel, fortified baby food.
2. Legumes and Nuts: Beans, peas, lentils, or nuts; foods made with oil, fat, ghee, or butter.
3. Dairy Products [Milk (Other than breast milk), Yogurt, Cheese, or other milk products].
4. Flesh Foods (Meat, Fish, Poultry, and Liver/Organ Meats).
5. Eggs.
6. Vitamin-A Rich Fruits and Vegetables.
7. Other Fruits and vegetables.

Dietary Score –

The dietary diversity score (DDS) was defined as the number of food groups consumed by the child the previous day. A dietary diversity score of four is considered the minimum DDS. Accordingly, a child with a DDS < 4 were classified as having low dietary diversity; otherwise, they were considered to have adequate dietary diversity.



The dietary score was calculated with the below computation as:

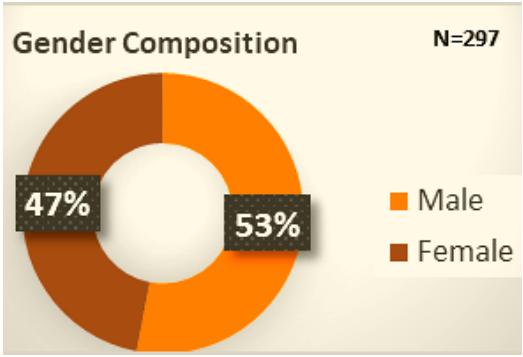
"Children 6–23 Months of Age who Received Foods from ≥ 4 Food Groups During the Previous Day DIVIDED BY No. of Children of 6–23 Months of Age".

Analysis was done with the cut-off of at least four of the above seven food groups because it is associated with better quality diets for both breastfed and non-breastfed children. Consumption of foods from at least four food groups on the previous day would mean that in most populations the child had a high likelihood of consuming at least one fruit or vegetable that day, in addition to a staple food (grain, root, or tuber). The following are the key findings -

Characteristics of the children included in the study

We included 297 children in the study: 216 from Madhya Pradesh and 81 from Bihar. It may be mentioned here that the study for both the Lactating Mothers of children of age 6 months to 23 months (whether being currently breastfed or not) was undertaken in one single visit. Adequately diversified diet, in terms of amount and composition, is critical for optimal growth, development, and long-term health outcomes in children.

Gender Composition –



In the IDDS survey, 297 children in the age group of 6 to 23 months of age were surveyed in which the finding revealed females as 47% and Male as 53%. The below table shows the district-wise information on male and female composition. In Umaria, the percentage of female children is high at 54% as compared with other districts, and the lowest was observed in the Panna district with 39% of females.

District	Umaria	Panna	Rewa	Satna	Jehanabad	Sitamarhi	Total
Male	46%	61%	50%	52%	53%	51%	53%
Female	54%	39%	50%	48%	48%	49%	47%

Further, the status of the child's health was also observed, and found that 95% of children were breastfed and 90% of the children's health were found with no illness during the survey.

Dietary diversity in the overall project area –

When considering the total sample of children aged 6-23 months, the average dietary diversity score is 21%. Among which Madhya Pradesh is 19% and Bihar with 24%.

Based on the district-wise findings the highest remains with Sitamarhi (26%) and the lowest with Satna (15%) among the 6 districts surveyed.

District-wise	Umaria	Panna	Rewa	Satna	Jehanabad	Sitamarhi	Total
Grains, white roots and tubers, and plantains	42%	43%	49%	45%	52%	57%	**47%**
Nuts and seeds	33%	24%	25%	18%	27%	44%	**28%**
Dairy	68%	60%	36%	23%	39%	48%	**47%**
Meat, Poultry, and Fish	0%	0%	0%	0%	4%	1%	**1%**
Eggs	0%	0%	0%	0%	4%	2%	**1%**
Vitamin-A rich vegetables or roots	5%	1%	0%	1%	0%	1%	**1%**
Other fruits and vegetables	23%	8%	25%	15%	26%	27%	**20%**
Average	**24%**	**19%**	**19%**	**15%**	**22%**	**26%**	**21%**

Baseline findings -

As per the baseline survey which was held in 2020 for Children aged 6 to 59 months, the intake of food in the daily diet was observed. Maximum 3-4 food groups are served adequately namely starchy staples, pulses, dark leafy vegetables, and other vegetables followed by the regular intake of Milk (as shown in the below table). There is a lack of food consumption of tubers & roots, vitamin-A-rich food, other fruits, egg, and meat/poultry/fish.

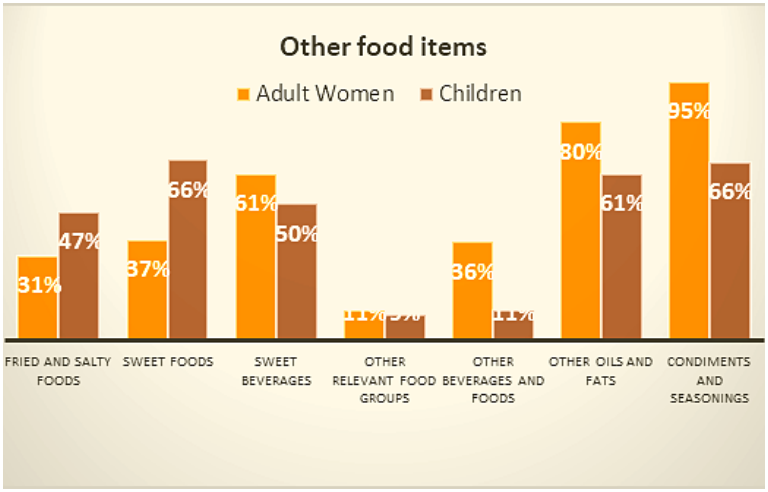
N= 1623 (in %)	Grains, Cereals, Rice	Pulses	Dark leafy vegetable	Tubers & roots	Another vegetable	Milk	Seasonal Fruits	Chicken/ Meat/ Fish
	91	60	42	3	36	44	10	6

While compared with the IDDS, the children's diet was composed mainly of "cereals, roots and tubers" and “Dairy”. However, “Vitamin A-rich fruits and vegetables and other fruits and vegetables”, and "Egg, meat products and fish" are less consumed. The “starchy staples” and “Dairy” remain to be high in the IDDS survey as well.

While comparing with NFHS -5 (2019-21) the percentage of children age 6-23 months living with their mother who is fed a minimum dietary diversity based on breastfeeding status, several food groups, and times they are fed during the day or night preceding the survey, remains as 18.8% in Madhya Pradesh and 19% in Bihar. This is followed by a total of children aged 6-23 months receiving an adequate diet with 9.2% in Madhya Pradesh and 10.9% in Bihar.

Other Relevant Food Groups

The reason for including this additional food group on the MDD-W questionnaire is primarily to provide a space for enumerators to mark food items that are consumed in amounts that are typically small and do not contribute substantially to micronutrient adequacy. While computing the dietary diversity score food groups, “beverages”, “condiments”, and “other oils and fats” were not considered for analysis to avoid falsely inflating food group diversity.



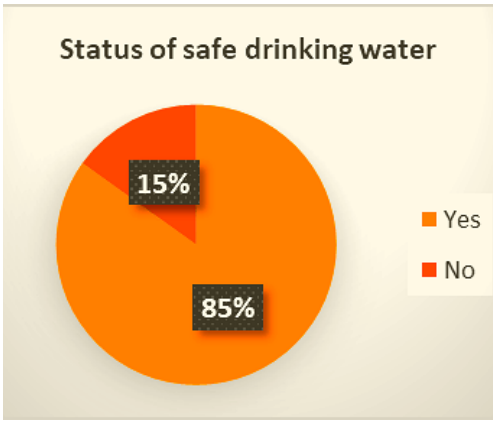
“Fried & salty foods”, “sweet foods”, and “sweet beverages” are considered Unhealthy Food Groups. This food group includes highly processed commercial products, but also a variety of locally produced and processed snacks and street foods.

The packaged salty snacks are usually simple carbohydrates high in fat and sodium and numerous artificial additives, offering virtually no protein, dietary fiber, or micronutrients. These food products play a significant role in unhealthy diets (Askari et al., 2020; Cranston et al., 2020; Lane et al., 2020; Pagliai et al., 2020). These Unhealthy food groups are related to the Risk of Non-Communicable diseases such as type 2 diabetes, hypertension, and obesity.

Based on the findings of the IDDS, a high intake of “sweet foods” was observed among children with (66%). Among the adult women, a high intake was observed for “sweet beverages” (61%) which may lead to obesity.

Water and Health

The survey also comprises of analyzing the intake of safe drinking water and its sources. Although, this section is not included in the standard guidelines of FAO. However, contaminated water and poor sanitation are linked to the transmission of diseases such as cholera, diarrhea, dysentery, hepatitis A, typhoid, and polio. Absent, inadequate, or inappropriately managed water and sanitation services expose individuals to preventable health risks. Sustainable Development Goal target 6.1 calls for universal and equitable access to safe and affordable drinking water. The target is tracked with the indicator of "safely managed drinking water services" – drinking water from an improved water source that is located on-premises, available when needed, and free from fecal and priority chemical contamination.



The finding reveals that 85% of the respondents are receiving safe drinking water which MP remains (78%) and BR (100%), and the remaining 15% (from MP) require some kind of processing for making the water drinkable.

Further, an analysis was done on the main sources of water and the result was found as handpumps (50%) followed by open community well with (16%).

The below table shows District-wise and its sources which were culled out from the questionnaire designed along with the IDDS.

Sources	Umaria	Panna	Rewa	Satna	Jehanabad	Sitamarhi	Total
Handpump	37%	59%	41%	61%	11%	94%	50%
Well	31%	12%	22%	27%	0%	0%	16%
Tap water (Nal Jal Yojana)	11%	8%	0%	3%	27%	3%	8%
Handpump (Nal Jal Yojana)	0%	0%	0%	0%	56%	3%	8%
Borewell	2%	12%	23%	9%	0%	0%	8%

Although, 85% are getting safe drinking water at their doorstep and the government is taking efforts for achieving this. Approaches to supporting the safe management of these water bodies should be continued. However, the water supplied through these sources is not tested on its quality due to which the people are unaware of the safety parameters.

Conclusion

Dietary diversity is one of the key elements of diet quality. The present study has highlighted that more than half of the population do not reach adequate dietary diversity and age, area of belonging, type of family, and occupation are major determinates of dietary diversity.

Lack of dietary diversity is particularly a considerable problem among poor populations as their diets are predominantly based on starchy staples. In the present study, cereal / starchy staple consumption was 89% for adult women and 47% for children and almost all other food group consumption was low. Especially, their vitamin-A-rich foods, dairy, fruits, eggs, and animal food consumption were poor. Furthermore, carbohydrate was the main energy contributor to the diet over other macronutrients. This condition may be due to their daily consumption of a starchy-based diet with few other food commodities. The present study mainly focused on the validation of dietary diversity indicators as an indicator of the nutrient adequacy of rural elderly women and children.

Findings from this study emphasized that increased dependence on purchasing food, decreased own production, poor climatic conditions, lack of suitable land, limited access to food due to lack of income, and high food prices are the main causes of food insecurity and low dietary diversity in women.

Recommendation

- Nutri-sensitive literacy program on dietary diversity should be organized to make people aware of the importance.
- Encourage more women for community and kitchen gardening that can reduce food insecurity and improve dietary (micro and macronutrient) intake through consumption of fresh vegetables and fruits.
- Furthermore, as food prices are continuing to increase gradually and household food insecurity becomes worse, ways to shift the 'income circumstances' through the promotion of the alternative food activity of these poor households need to be advocated.
- During the PLA sessions, initiate discussion on the importance of vitamin-A-rich foods, iron-rich food, etc. for accumulating such less consumed food groups in the daily platter.
- Analyzing the nutritional status of Pregnant and Lactating women, women of reproductive age, adolescent girls, and children age 6 to 59 months through anthropometric measurements for accessing the impact of the adequate intake of essential nutrients and hence promoting good health.
- For, it is recommended to have tested the water bodies for analyzing their accessibility.
- Existing channels that have a wide outreach, such as PDS, Integrated Child Development Services (ICDS), and the Mid-day Meal (MDM) initiative should be utilized to promote diversity in diets. The government should consider including local food items like millets, and pulses, among others, in the PDS food basket as they cost less and have better nutritional components.

Glimpses