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Nutrient Intake in Odisha

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ABSTRACT

This paper investigates the household consumption pattern in rural Odisha, India during December - January 2019-20 for a basket of 53 commodities. Both in rural and urban areas, cereals, edible oil, vegetables, spices, fuel and light are found to be treated as necessities. We observe the differential impact of household size on household consumption pattern in the study area. We study the consumption of five key nutrients, namely, calories, proteins, carbohydrates, calcium and Iron. We also show the demographic factors such as gender, and caste which matter for nutrition.

Keywords: Nutritional intake, Rural Odisha

JEL Classification Codes: D1, I1

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I. INTRODUCTION

Odisha was famous as “Urda”, “Koshala”,” Kalinga” and “Utkal”. All the regions come together and came under one administration. The separate state was formed in 1936.which was known as “Odisha”. The modern Odisha that we see today has been the result of the efforts of Madhusudan Das, Fakir Mohan Senapati, Gopabandhu Das and many more. The language of Odisha or the Odiya Language was originated during Ananta Barman. Odisha, the land of Lord Jagannath situated by the West Bengal on the North -East, Jharkhand on the North, Chhattisgarh on the West and Andhra Pradesh on the South. Its diverse land scape comprises coastal plains, mountainous terrain, plateaus, verdant river valleys and slopes dotted with watersheds, springs, lakes, and forest cover of varying density. It is a wonderful land with all kinds of natural resources.

Agriculture is main occupation of the people of Odisha. About 60 per cent of its population draws its subsistence fully or partly from agricultural sector. The modern economy and economic progress of a nation is mainly regulated by the industrial development it achieves. Though Odisha is primarily an agrarian region, she has all the support system for industrial growth, starting from minerals deposits to sufficient water, vast landscape and manpower. Similarly, service sector is found to be the most important sector of the Indian as well as Odisha economy. As we know, it is proved to be the dominant sector in terms of its shares to the GDP of the country and GSDP of the state. Generally, this sector consists of different kinds of services like hotels, transport and communication, banking and insurance.

Odisha is one of the poorest states in India. According to the National Human Development Report (2001) (NHDR 2001), Odisha lies far below the national level development almost in all respect. In 1983, Odisha, Bihar, West Bengal and Tamil

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Nadu had more than 50 per cent of their population below the poverty line. By 1999- 00, West Bengal and Tamil Nadu have succeeded in reducing this by nearly half, whereas Odisha and Bihar continued to be two poorest states with poverty ratio 47 per cent and 43 per cent respectively. On the other hand, the poverty ratio has declined from 44.48 per cent to 26.10 per cent at the national level. Planning Commission (2001) also points out that the rural areas in Odisha and Bihar are the poorest rural areas.

Health services is another basic necessary of the human beings and health sector has been one of the priority areas of the state Govt. At the time of independence, proper health services and health care facilities were not available in the state especially in the rural areas, leading to high mortality and death rate. The main of the public health in Odisha has been to improve access to healthcare for the underprivileged segments of the population. This is being achieved through consolidation of the primary, secondary and tertiary health-care infrastructure and effective implementation on National Programmes for combating major public health problems like communicable and nutrition related diseases.

Consumption is one of the most important activities of any household/individual. Expenditure on consumption is also one of the indicators of the economic well beings of the population. In general, poor households tend to spend more on food items than on non-food items. One can expect a declining trend in expenditure on food with the development and economic prosperity. At the national level, the share of expenditure on food declined from 65.6 per cent in 1983 to 59.4 per cent in 1999-00, and a corresponding increase in non-food expenditure from 34.4 per cent to 40.6 per cent in rural areas. The share of food expenditure continued to be above 60 per cent in rural Odisha. In the urban areas, the share of expenditure on food declined from 58.7 in 1983 to 48.1 per cent in 1999-00 at the national level, whereas for Odisha it was more than 50 per cent in both periods.

Our bodies need nutrients in order to live and function properly. A differentiation is made between those that it needs in large quantities (macro-nutrients) in order to cover its energy requirements, and others which are just as essential but of which it only needs very little (micro-nutrients). The macro-nutrients include carbohydrates, proteins and calorie. Micro-nutrients are calcium and iron.

Under nutrition is caused by lack of food or lack of right type of food and inadequate or inappropriate type of feeding. It is found that 51.63 per cent of children in 0-3 year of age suffer in any grade of under nutrition. As regards to optimal infant feeding practices, as prescribed by the World Health Assembly, only 33.5 per cent of infants are exclusively breastfed for the first six months of life and 29.5 per cent of infants continues breastfeeding with complementary family foods**.** Under nutrition is the tragic combination of poor socio-economic development, lack of health care knowledge among parents, administrative lapses and poor monitoring of the operational schemes. Between NFHS II (1998-99) and NFHS III (2005-06) under nutrition among children in Odisha reduced from 54 per cent to 44 per cent, but this lacks the urgency and priority in terms of planning, monitoring, and strategic input. Under-nutrition status as per Economic survey of Odisha 2010-11, however continues to be high, 40.7 per cent of children below three years are underweight (weight for age), 45 per cent stunted (height for their age) and 19.5 per cent are wasted (weight for their height).

The state-level data mark the disparity within the districts/populations. District-level household survey (DLHS) on reproductive and child health (2002-2004) shows

the level of under-nutrition is higher in the districts with predominantly tribal population. The NFHS III (2005-06) data also shows that the level of under-nutrition is higher among the tribal population. According to state tribal health report card 54.4 per cent of children below three years are underweight (weight for age), 57.2 per cent stunted (height for their age) and 27.6 per cent are wasted (weight for their height).

The extant literature has largely modelled the relationship around the effect of better nutritional status on income, and PDS (public distribution system). The Public Distribution System (PDS) in India is an important public intervention for enhancing food security. The PDS provides subsidized food grains (and other essential commodities) through a network of 'fair price shops. Until 1992 access to the PDS was, at least in theory if not in practice, universal. Corruption and high operational costs were among the reasons that were used to justify the move to the Revamped Public Distribution System (based on a principle of geographic targeting) in tribal, arid, hill and remote areas in 1992 and then to a Targeted Public Distribution System (TPDS) in 1997. Under the TPDS, households were classified as Above Poverty Line (APL) or Below Poverty Line (BPL), based on the economic status of households. BPL households continued to receive subsidized food grains through the TPDS whereas subsidies for APL households have been gradually phased out. In Odisha many policies have been taken by the government of Odisha to improve the nutritional condition in the state. Among them public distribution system takes an important position targeting the vulnerable peoples of the society who need external support to survive in the society. Thus, we have also taken PDS as nutritional variable in the study area and tried to know that whether it has a significant impact on nutrition or not in the study area.

II. REVIEW OF LITERATURE

Subramanian and Deaton (1996): This paper shows the relationship between nutrition and expenditure. According to them the elasticity of calories consumption with respect to total expenditure lies between 0.3-0.5. The data collected by them shows that the calories necessary for a day's activity cost less than 5 per cent of the daily wage, which make it implausible that income is constrained by nutrition rather than other way round.

Dreze and Deaton (2009): This paper investigates the food intake and nutrition in India. It also investigates why there is decline of average calorie intake during last 25 years. The decline is due to distribution of real per capita expenditure, in spite of increases in real income and no long term increase in the relative price of food. It also shows that the calorie requirement is declined due to low level of physical activity or improvement in health environment. If this is true, then we say that there is calorie deficit in Indian population. This problem can be solved by better nutrition monitoring.

Pujari (2004): This paper investigates the household consumption pattern in rural and urban Odisha during 1999-00 for a basket of twelve commodities and estimates the corresponding Engel functions with Working-Lesser methodology. In rural areas, income effect dominates the specific effect in most cases, whereas the converse is true for urban areas. This is due to the difference in some demographic and structural factors. Similarly, some factors like occupational status, religion and social groups are helpful in explaining the variation of budget shares of the commodities in most of the cases.

Behrman and Deolalikar (1987): This paper shows a strong relationship income and nutrition. According to World Bank and other income is the main determinant of

improving nutrition in poor communities. This paper also shows that per capita income has less impact on nutrition consumption.

Gaiha et al. (2013): Provide an alternative hypothesis focusing on fat and protein in addition to calorie; they found that the decrease in demand for these nutrients is mainly due to decrease in the consumption of food products resulting from higher prices.

Dercon, Krishnan & Krutikova (2013): Using ICRISAT village level data found that lower consumption growth and a higher likelihood for staying poor for lower caste groups.

Siddiqui, Donato & Jumrani (2010): We utilize large national household datasets for 1993–1994, 2004–2005 and 2011–2012 to analyze factors influencing changing patterns in per capita calorie consumption in India. Our study findings demonstrate the significance of the disease environment in which people live, with those living in healthy areas having lower calorie consumption than those living in less healthy ones. Calorie intake has been falling in India, but the study findings reveal that fat calorie intake has been rising successively over time among the rural and poorer urban sub-populations raising concerns for policy-makers that non-communicable diseases are expected to rise for these vulnerable population groups.

Smith (2013): This paper's review of the Indian calorie debate finds that many of the proposed explanations for declining calorie consumption are not plausible given that undernourishment has risen as well and people would not voluntarily enter into a state of hunger. The paper presents evidence that food and calorie consumption have been rising during India's recent economic, nutrition and epidemiological transitions. There has also been a gradual shift towards more food being consumed outside of the home. The empirical analyses indicate that (1) food consumed away is not being fully counted in estimates of calorie consumption; and (2) seen from a cross-country perspective, doing so matters for estimates of calorie consumption from national HCESs.

Roy (2001): This paper estimates the relationship between calorie intake and income within a semi parametric framework, which allows for heterogeneity across individuals and possible nonlinearity in the relationship. The poor household, the calorie intake responds more to income changes than the richer households. The income elasticity of calorie intake obtained are small but statically significant for most income levels.

Sinha (2011): By taking a second-round survey in Palanpur in Uttar Pradesh studies the nutrition level with the previous round survey and find there is an increase in the nutritional level in the passage of time by securing improvement in the condition of education and BMI (Body Mass Index).

Dawson and Tiffin (1998): Using secondary data found that a long run relationship exists and that a one per cent increase in real per capita income increases the daily per capita calorie intake by 0.34 per cent.

Strauss and Thomas (1998): By reviewing the USA data on income and health they found that there is a strong effect of income on demand for health status and there was less agreement on the reverse relationship: the effect of health on income.

Sen (2005): Using primary data found that PDS contribution to nutrition is not attractive may be due to the reason that beneficiary sale its others at a higher price than the actual price, and per-capita income has a greater influence on nutrient consumption than the other determinants.

Dutta, Kapoor and Pattanaik (2017): Using primary data on food consumption they studied the direct consumption of macro nutrients and micronutrients, they found there is a positive and significant impact of income and PDS on consumption of both the nutrients.

Panda (1997): By using primary village level data of five villages from western Odisha on female headship, poverty and child welfare found that the female headed household are spending more on nutrient food consumption then the male headed household. But the female headed households are less spending on non-staple foods then the male headed household.

Ghosh and Qadeer (2017): Using secondary data (NSS) found that gradual increase in calorie intake at the bottom, when for the rest of the population calorie intake has declined particularly from 1993-94 to 2009-10.

Khera (2011): This article studies the effectiveness of India's Public Distribution System (PDS) as a food security intervention, using field survey data collected by the author in Rajasthan. Utilization is low, and many households purchase wheat from the market at higher prices before exhausting PDS quotas. This 'puzzle of under-purchase' is analyzed by extending the dual-pricing model to account for supply-se (for example, diversion) and demand-side (for example, transaction costs) constraints. Primary and secondary data as well as field observations suggest that under-purchase is mainly due to supply constraints. I also find that the PDS affects the composition (away from more nutritious 'coarse cereals'), rather than level, of cereal consumption.

III. OBJECTIVES

To know more about the village consumption pattern, objective of the study set in two ways as follows:

- To analyze the nutrient consumption in the study area
- To study the determinants of consumption of several nutrients

IV. DATA AND METHODS

This survey was done in the village Ranapada of Puri district of Odisha which is nearest to Puri city around 30 km This village is consting of 650 house hold out of which 50 house hold were selected randomly by using simple random table.so sample size was 50 and sampling unit is house hold. Unlike the recent studies which are relied on the NSSO data, we have collected primary data on living standard of the sample house hold. Unlike NSSO and ICRISAT data which are based on 7 day and 24 hour recall period respectively, we have taken 30 days recall period on food consumption which may work better on non-staple like meat may be consumed bi-weekly.

The survey has been conducted during December - January 2019-2020.Information is collected 55 food items across 11 food categories. For each food item we gathered information on the house holds consumption of quantity and expenditure over the preceding 30 days in market transaction.

We have taken the nutritional variables as follows:

1. Micronutrients: Calcium and Iron.

2. Macro nutrients: calorie, carbohydrate and protein

The conversion of food items to nutrients were made as per the norms of National Institute of Nutrition, Hyderabad.

In this study we have used descriptive statistics to know the demographic feature of the village as well as nutrient consumption of the study area.

V. ANALYSIS AND RESULTS

On the basis of the above data we have seen the demographic factors which may affects the nutrition consumption. A key factor in socio economic status, particularly in rural areas is Caste. The customs and preferences of the households which may depend on the Caste can influence their consumption for certain kind of foods and thus nutrients. We have taken the caste, gender and size of the household in Table 1, which shows that there are only four categories: General, SEBC, SC and ST living in this village. We found that there is more number of households belonging to General categories.

Table 1: Demographic Information of the Sample Households

	General	SEBC	SC	ST	Total
Male	15	10	14	33	72
Female	20	22	15	11	68
Total Individuals	35	32	29	44	140
Households	24	7	4	15	50

Source: Primary Data

We have also observed that farming and wage labour households probably focus on more calorie-intensive foods such as carbohydrates rather than calcium and iron rich foods. Kumar et al. (2012) find a difference in nutrients consumption based whether the head of the household works in agricultural sectors or not. In particular, Panda (1997) finds that in Odisha female headed households spends less on high quality foods. Thus, independent of the food expenditure and other factors we control for the gender of the households' head to see if that matters for nutrient consumption. Food consumption patterns might also be influenced by the human capital of the head of the households. We would expect that more educated household heads may be better informed about the virtues of a more balanced and nutritious diet. We capture human capital by the head of the households. In the literature of (Kumar et.al. 2012; Behrman and Deolalikar, 1990) age of the head of the household is taken as a determinant of nutrition.

Table 2: Distribution of Sample Households by Income Groups

Education on Income	Income Per Month	Primary Education	Secondary Education	Higher Education	Total
Small Income	5000-10000	10	9	5	24
Middle Income	10001-15000	9	7	1	17
High Income	15001-20000	3	5	1	9
Total		22	21	7	50

Source: Primary Data

We have also seen from Table 2 that around 48 per cent, 34 per cent and 18 per cent of the sample households are falling under small, middle and high- income groups respectively. Similarly, 44 per cent, 42 per cent and 14 per cent of the sample household are coming under primary, secondary and higher education respectively. Here, we grouped the sample households according to their income like small, middle and high- income group with their respective income likewise 5000-10000, 10000-15000 and 15000-20000 respectively.

To analyze the food consumption and subsequently the nutrition intake of the village, we can see from Table 3 that cereals and vegetables constitute the bulk of food consumption. Given the food preferences in Odisha, rice constitutes the bulk of consumption within cereals. On average, the cereals consumption is around 11.04 Kg per month for each individual. Which is little less than other studies such as Dreze (2007), where for 2000-01 in rural areas the reported average cereal consumption per month was 12.5 Kg at all India level survey. Ray (2007) finds that in 2002 per capita mean monthly consumption of vegetables and fruits are around 7.8 Kg, whereas meat, fish and eggs are 0.8 Kg. This study on the other hand shows that per capita monthly vegetables and fruits consumption is around 7.9 Kg. For meat, fish and eggs we find that the monthly average consumption is 1.1 Kg which is more than Rays' finding.

Table 3: Total Per Capita Quantity Consumed Over the Last 30 Days (in Kilogram)

Commodity	Mean	Minimum	Maximum	SD	DKP
Cereals	9.2	2.66	26.5	4.64	11.04
Pulses	0.95	0.25	8.5	0.5	1.43
Vegetables	7.9	2.85	24.5	4.2	7.53
Fresh fruits and Berries	1.92	0	5.5	0.98	1.28
Dry fruits and Nuts	0.09	0	0.75	0.18	0.08
Sugar, Gur and Salt	0.88	0.5	9.75	0.3	1.33
Spices	0.5	0.25	1.8	0.29	0.32
Milk products	1.25	0	7.5	2.13	1.89
Edible Oil	0.67	0.21	1.3	0.27	0.52
Meat, Egg and Fish	1.13	0	3.5	1.05	1.68

Source: Primary Data

We study the daily consumption of macro and micronutrients by the people in this village. For macro nutrients, Carbohydrate and Protein the units of measurement are in grams (gms) and for calories it is in Kilo Calories (Kcal). For the micronutrients, Calcium and Iron, it is milligrams (mgs). The daily per capita mean consumption of Calories in our study is around 2076.03 Kcal and Protein is around 53 gms (presented in Table 4 in below).

Table 4: Descriptive Statistics of Daily Nutrition

Nutrients	Minimum	Maximum	Mean
Carbohydrate (gm)	55.98	618.91	385.15
Calorie (Kcal)	932.09	4296.08	2076.03
Protein (gm)	22.23	106.04	53.41
Calcium (mg)	220.09	1368.05	484.18
Iron (mg)	11.85	51.85	14.48

Source: Primary Data

This is above to Kumar et.al. (2012) report that in rural India for 2009-10, the daily per capita calorie and protein consumption was 2147 Kcal and 59.3 gms respectively. Thus, the nutrient consumption that we find in our data is some extent has improved from those reported in other studies.

VI. CONCLUSION

This is a preliminary study of house consumption pattern in a rural village of Puri District, Odisha. In this area we found that cereals, edible oil, Vegetables, Spices, Fuel and light are found to be treated as necessities. On the other hand, eggs, fish, meat, sugar, education and medial are found to be luxuries in study areas. Pulses and beverages are reported to be in luxuries basket for rural areas. However, milk and milk products are treated as luxuries in the study areas.

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