

## State of calories intake in Odisha and role of public policies

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### Abstract

The paper examines the trend and pattern of calories intake in Odisha. Data from different quinquennial rounds of National Sample Survey (NSS) are analyzed and it finds – at the aggregate level there is a significant improvement in calories intake by the people of Odisha since early 1970s. The disaggregated analysis also shown a better picture of Odisha compared to all India in this regards as far as calorie intakes are concerned, the poor of Odisha are in a better position than the poor of all India. Reviews of different public policies shows- a number of positive reforms have been implemented during that time both by the centre and by the state governments to improve the food and nutritional securities in the state, which might have been the reason of such improvement.

**Keywords:** Calorie intakes, Public Provisioning, Odisha

### Introduction

Food is the basic need for living being. But “unlike plants, which can manufacture the foods they need from simple chemicals derived from the soil, from water and from the carbon dioxide in the air, higher organisms, including man; do not possess this capacity to manufacture food” (NSSO, 2014) [8, 9]. Hence human being has to depend on plants or other animals for obtaining the food that they need. However men have a very wide range of foods to fulfill their dietary requirements and the quantum of those foods are measures in different units. But to know to what extent a person has fulfilled his/her dietary requirements, it is required to know the range of food in a single unit of measurement and one of the measures is the calorie or Calorie [1]. Hence calories intake is a necessary parameter to adjudge the survival condition of human being. It is also argued in the literature that – nutritionally sound person has better contribution to economic growth (Dasgupta, 1993). Therefore, not only from survival point of view but from economic growth and social justice point of views adequate calories intakes of individuals are desirable in any society (Rawls, 1971; Dasgupta, 1993; Dreze & Sen, 1989) [10].

Odisha is one of the Indian states where the calorie deprivation has been a perennial problem and also a major concern, which might be due to specific economic and social structure of the state (Kumbhar, 2013) [6]. But over time by virtue of State’s economic and social policies, though at the aggregate level incidence of such problems are ameliorated to an extent, at the disaggregated level it still persist. This paper is an attempt to examine the state of calorie intakes in Odisha. Data for the paper has been collected from the large scale sample survey (i.e. quinquennial rounds) conducted by the

National Sample Survey Organisation (NSSO). NSSO collects data on household’s consumption expenditure and from that data the Nutritional intakes reports are prepared. The reports provide information on intakes of calorie, protein and fat across at the national and state level. It also provides similar information for different monthly per capita expenditure (MPCE) class. The present paper confined to calorie intakes at the aggregated and disaggregated level.

The collected data have been analysed at two stages. First, at the aggregate level the trend of calorie intakes in Odisha vis-à-vis all India are presented. At the second stage the disaggregated analysis was done to examine the variability in calorie intakes across different MPCE classes and then to find out whether the dispersion has decreased, increased or remained constant. Then the findings are explained through the state’s policies. Therefore, simple tabulation, percentages, dispersion and descriptive analysis are the tools of analysis for the paper. The remaining of the paper has three sections. Section I analysed the calories intake data at the aggregated and disaggregated level, section II review the state’s food and nutritional security policies and section III conclude the paper.

### Section I

#### Calorie intakes in Odisha and India: Trend Analysis

Calorie intake is an important indicator in assessing the nutritional status of an individual. It also depicts the picture of malnutrition [2]. Table 1 and 2 assesses the trend of calorie intake at the aggregated level for Odisha and her position at all India level from 1972-73 to 2011-12. The table reveals that-

- In rural sector, not only the *level* of the calories intake per consumer unit (PCU) [3] remained lower in Odisha during

<sup>1</sup> Quantitative food requirements are usually set in terms of energy. The unit of measuring energy is kilocalorie (Kcal) which is the amount of heat necessary to raise the temperature of one kg of water by 1oC from 14.5oC to 15.5oC. This is also called 1 Calorie and equals 1000 calories – the calorie being the heat required to raise 1gm of water through the same temperature.

<sup>2</sup> Malnutrition could be caused either by under consumption or by over consumption of any essential nutrient. The under consumption of essential nutrient could be considered as hunger. There are four types of malnutrition, such as *over nutrition, secondary malnutrition, dietary deficiency or micro nutrient malnutrition and protein-calorie malnutrition*. Over nutrition occurred out of over consumption,

which is mainly the problem of high-income countries or high-income group. Whereas, under nutrition occur mainly out of under consumption of calorie, protein and micronutrient. However, over nutrition is not a bigger problem for the developing countries rather, the most common types of malnutrition faced by the developing countries like India and especially by developing state like Odisha is under nutrition, which arises out of inadequate consumption of specified diet.

<sup>3</sup> Consumer unit is the rate of equivalence of a normal person determined on the basis of age-sex compositions of a person. From the 26<sup>th</sup> round, NSSO has been using a level of 2700 kcal per consumer unit per diem as a standard.

1972-73, compared too many other Indian states and all India, but the calories intake of the people of Odisha has also remained much lower than the required level of 2700 Kcal. However, such situation had improved during 1993-94, but marginally declined in 2004-05 and then shown an improvement and remained marginally higher than all India average in 2011-12. As far as rank <sup>[4]</sup> of the state in terms of calories intake is concerned there is improvement. Further in term Odisha calories intake as a percentage of all India- there is a steady improvements

- from 87 percentages at 1972-73 to 101 percentages in 2011-12.
- In urban Odisha, the case is different where the level of PCU intake of calorie has been higher in Odisha compare to all India throughout the period of analysis. Yet the calories intake by the people of Odisha has remained much lower than the required level of 2700 Kcal during 1972-73 to 2011-12. In terms of rank Odisha’s relative position remained at 6 during 2011-12.

**Table 1:** Calorie intake by the people of Odisha and her position compared to major Indian states in rural and urban sector, 1973-74 to 2011-12

State	Rural					Urban				
	1972-73	1983	1993-94	2004-05	2011-12	1972-73	1983	1993-94	2004-05	2011-12
Odisha	2494	2624	2740	2512	2622	2845	2735	2754	2596	2561
Rank	13	12	7	11	6	6	4	3	4	6
India	87.3	94.4	102.1	98.90	101.27	108.0	106.3	108.3	104.89	101.99

*Notes:* Odisha’s figures have been expressed in K. Calories. India’s figures express what percentage of India that Odisha is consuming. For 2004-05 and 2011-12 rank is calculated from 15 states. For other periods, rank is calculated from 17 states. Source: Various NSSO reports

Overall, while in rural Odisha there is steady increase in calorie consumption and not only catch up the rural India’s figure by 1990s but by 2011-12 the rural Odisha figure is marginally higher than that of rural India, whereas the calorie consumption in urban Odisha has always remained higher compared to urban India. But since only 17 percent of the population resides in urban Odisha, the better performance in urban areas will not improve the overall situation of the state unless much improvement is brought in rural Odisha.

Table 2 (A & B) provides the changes in average per capita intake of calorie per day over different NSS rounds for the major Indian states, which reveals that though there is steady increase in the calories intakes of the people of Odisha yet there are some Indian states especially, Punjab, Haryana and Rajasthan always remained at higher level than Odisha in rural area. In the case of urban area also these states remained ahead of Odisha but in 1993-94 and 2009-10 Odisha’ per capita calorie intakes was highest among the Indian states.

**Table 2(A):** Changes in average per capita intake of calorie per day over NSS rounds across major States in Rural Area in India

States name	1972-73	1983	1993-94	1999-2000	2004-2005	2009-2010	2011-12
Andhra Pradesh	2103	2204	2052	2021	1995	2047	2186
Assam	2074	2056	1983	1915	2067	1974	2010
Bihar	2225	2189	2115	2121	2049	1931	2057
Chhattisgarh	-	-	-	-	1942	1926	2037
Gujarat	2142	2113	1994	1986	1923	1982	1915
Haryana	3215	2554	2491	2455	2226	2180	2254
Jharkhand	-	-	-	-	1961	1900	2042
Karnataka	2202	2260	2073	2028	1845	1903	2003
Kerala	1559	1884	1965	1982	2014	1964	1975
Madhya Pradesh	2423	2323	2164	2062	1929	1939	2110
Maharashtra	1895	2144	1939	2012	1933	2051	2103
Orissa	1995	2103	2199	2119	2023	2126	2116
Punjab	3493	2677	2418	2381	2240	2223	2328
Rajasthan	2730	2433	2470	2425	2180	2191	2263
Tamil Nadu	1955	1861	1884	1826	1842	1925	1926
Uttar Pradesh	2575	2399	2307	2327	2200	2064	2436
Uttarakhand	-	-	-	-	2160	2179	2112
West Bengal	1921	2027	2211	2095	2070	1927	2092
all-India	2266	2221	2153	2149	2047	2020	2099

*Source:* Various NSSO reports

<sup>4</sup> Rank has been calculated from 15 major Indian states.

**Table 2 (B):** Changes in average per capita intake of calorie per day over NSS rounds across major States in Urban Area in India

States name	1972-73	1983	1993-94	1999-2000	2004-2005	2009-2010	2011-12
Andhra Pradesh	2143	2009	1992	2052	2000	1975	2150
Assam	2135	2043	2108	2174	2143	2003	2038
Bihar	2167	2131	2188	2171	2190	2013	2080
Chhattisgarh		-	-	-	2087	1949	2072
Gujarat	2172	2000	2027	2058	1991	1983	2070
Haryana	2404	2242	2140	2172	2033	1940	2165
Jharkhand	-	-	-	-	2458	2046	2101
Karnataka	1925	2124	2026	2046	1944	1987	2007
Kerala	1723	2049	1966	1995	1996	1941	2030
Madhya Pradesh	2229	2137	2082	2132	1954	1854	2029
Maharashtra	1971	2028	1989	2039	1847	1901	2039
Orissa	2276	2219	2261	2298	2139	2096	2094
Punjab	2783	2100	2089	2197	2150	2062	2172
Rajasthan	2357	2255	2184	2335	2116	2014	2151
Tamil Nadu	1841	2140	1922	2030	1935	1963	1975
Uttar Pradesh	2161	2043	2114	2131	2124	1923	2379
Uttarakhand		-	-	-	2205	1984	2004
West Bengal	2080	2048	2131	2134	2011	1851	2026
all-India	2107	2089	2071	2156	2020	1946	2058

Source: Various NSSO reports

**Calorie intakes in Odisha: A Disaggregated Analysis**

Here we have examined the calorie intakes by the people Odisha by their per capita consumption expenditure groups. Table 3 depicts- in 1983 while in rural Odisha the PCU calorie intake of the lowest monthly per capita consumption expenditure class (MPCE) is only 36 percentage of the calorie intake of an average person of state, the upper three MPCE classes consumes more than 150 percent of the calorie intake of an average person of state. Further the conditions of urban

poor are much worse- the PCU calorie intake of the bottom three MPCE classes are less than 50 percent, of which the lowest MPCE class's calories intake is 31 percent of the calorie intake of an average person of Odisha, whereas the highest MPCE class consumes 143 percent of the calorie intake of an average person of the state. The standard deviation depicts that the variation in calorie intake remain high in rural area (1210) compared to urban area (911).

**Table 3:** Per Consumer Unit intake of Calorie per day by the fractile class of MPCE in 1983

Rural			Urban		
MPCE in RS	Calorie	Percentage from all	MPCE in RS	Calorie	Percentage from all
0--30	972	36.36	0--30	832	31.13
30-40	1325	49.57	30-40	1319	49.35
40-50	1698	63.52	40-50	1285	48.07
50-60	1897	70.97	50-60	1751	65.51
60-70	2144	80.21	60-70	1937	72.47
70-85	2399	89.75	70-85	2210	82.68
85-100	2661	99.55	85-100	2473	92.52
100-125	2968	111.04	100-125	2623	98.13
125-150	3357	125.59	125-150	2810	105.13
150-200	3728	139.47	150-200	3030	113.36
200-250	4279	160.08	200-250	3162	118.29
250-3000	4396	164.46	250-3000	3480	130.19
> 300	4666	174.56	> 300	3839	143.62
All	2673	100.00	All	2717	101.65
Standard deviation	1210.13			911.24	

Source: NSSO report, 1988

**Table 4:** Per Consumer Unit intake of Calorie per day by the MPCE class in 1993-94

Rural			Urban		
MPCE in RS	Calorie	Percentage from all	MPCE in RS	Calorie	Percentage from all
< 120	1827	66.68	< 120	1807	65.61
120-140	2189	79.89	120-140	2249	81.66
140-165	2433	88.80	140-165	2445	88.78
165-190	2563	93.54	165-190	2517	91.39
190-210	2830	103.28	190-210	2674	97.10
210-235	2911	106.24	210-235	2745	99.67
235-265	3068	111.97	235-265	2817	102.29

265-300	3173	115.80	265-300	2956	107.33
300-355	..	0.00	300-355	3101	112.60
355-455	3524	128.61	355-455	3301	119.86
455-560	3718	135.69	455-560	3236	117.50
>560	3947	144.05	>560	3623	131.55
ALL	2740	100.00	ALL	2754	100
Standard deviation	651.43			499.72	

Source: NSSO report, 1996

Table 4 depicts- in 1993-94 while in rural Odisha the PCU calorie intake of the lowest monthly per capita consumption expenditure class (MPCE) is only 66 percentage of the calorie intake of an average person of the state, the highest MPCE classes consumes 144 percent of the calorie intake of an average person of state. In urban Odisha while the PCU calorie intake of the bottom MPCE class is 65 percent of the

calorie intake of an average person of Odisha, the highest MPCE class consumes 131 percent of the calorie intake of an average person of the state. The standard deviation depicts that – though the magnitude has reduced, the variation in calorie intake remain high in rural area (651) compared to urban area (500). But there is a significant improvement in overall calories intakes of the people of Odisha.

Table 5: Per Consumer Unit intake of Calorie per day by the Fractile groups in 1999-2000

Rural			Urban		
Fractile groups	Calorie	Percentage from all	Fractile groups	Calorie	Percentage from all
< 5	1967	74.65	< 5	2100	74.95
5--10	220	8.35	5--10	2452	87.51
20--30	2384	90.47	20--30	2510	89.58
20-30	2627	99.70	20-30	3028	108.07
30-40	2696	102.31	30-40	2762	98.57
40-50	2879	109.26	40-50	2896	103.35
50-60	2898	109.98	50-60	3017	107.67
60-70	3105	117.84	60-70	3014	107.57
70-80	3200	121.44	70-80	3074	109.71
80-90	3374	128.05	80-90	3390	120.99
90-95	3560	135.10	90-95	3412	121.77
95-100	3771	143.11	95-100	4592	163.88
ALL	2635	100	ALL	2802	100
Standard deviation	934.80			623.46	

Source: NSSO report, 2001

Table 5 depicts- in 1999-2000 while in rural Odisha the PCU calorie intake of the lowest monthly per capita consumption expenditure class (MPCE) is 74 percentage of the calorie intake of an average person’s intake of the state, the highest MPCE classes consumes 143 percent of the calorie intake of an average person of the state. In urban Odisha while the PCU calorie intake of the bottom MPCE class is 75 percent of the calorie intake of an average person of Odisha, the upper MPCE classes consumes 163 percent of the calorie intake of an average person of the state. The standard deviation depicts that the variation in calorie intake remain high in rural area (935) compared to urban area (623). But this round too observed an improvement in overall calories intakes of the people of Odisha though there is high variation in calories intake.

Table 6 depicts- in 2004-05 while in rural Odisha the PCU calorie intake of the lowest monthly per capita consumption expenditure class (MPCE) is 75 percentage of the calorie intake of an average person of state, the highest MPCE class consumes 151 percent of the calorie intake of an average person’s intake of the state. In urban Odisha while the PCU calorie intake of the bottom MPCE class is 75 percent of the calorie intake of an average person of Odisha, the highest MPCE classes consumes 141 percent of the calorie intake of an average person’s intake of the state. The standard deviation depicts marginally higher variation in calorie intake in rural area (540) compared to urban area (505). But this round too observed improvement in overall calories intakes of the people of Odisha.

Table 6: Per Consumer Unit intake of Calorie per day by the Fractile groups in 1999-2000

Rural			Urban		
Fractile groups	Calorie	Percentage from all	Fractile groups	Calorie	Percentage from all
< 5	1878	74.76	< 5	1944	74.88
5--10	2156	85.83	5--10	2309	88.94
20--30	2393	95.26	20--30	2382	91.76
20-30	2537	101.00	20-30	2484	95.69
30-40	2611	103.94	30-40	2549	98.19
40-50	2748	109.39	40-50	2622	101.00
50-60	2848	113.38	50-60	2788	107.40
60-70	2973	118.35	60-70	2862	110.25

70-80	3135	124.80	70-80	3259	125.54
80-90	3138	124.92	80-90	3180	122.50
90-95	3438	136.86	90-95	3413	131.47
95-100	3804	151.43	95-100	3659	140.95
ALL	2512	100	ALL	2596	100
Standard deviation	540.33			505.78	

Source: NSSO report, 2007

Table 7 depicts- while in rural Odisha bottom 40 percent of the people consume less than the average consumption, in urban Odisha bottom 50 percent of the people consume less than state average. However, it is note that in rural Odisha the calories intake of the bottom five percent of the people are 22

percent point less than average and 47 percent point less than the average calorie intakes of the top five percent of people. The standard deviation depicts that the variation in calorie intake remain high in rural area (346) compared to urban area (298).

Table 7: Per Consumer Unit intake of Calorie per day by the Fractile class of MPCE in 2011-12

Rural			Urban		
Fractile group	Calorie	Percentage from all	Fractile group	Calorie	Percentage from all
< 5	2055	78.38	< 5	2274	88.79
5--10	2188	83.45	5--10	2257	88.13
20--30	2354	89.78	20--30	2207	86.18
20-30	2400	91.53	20-30	2243	87.58
30-40	2503	95.46	30-40	2540	99.18
40-50	2646	100.92	40-50	2528	98.71
50-60	2724	103.89	50-60	2655	103.67
60-70	2685	102.40	60-70	2672	104.33
70-80	2767	105.53	70-80	2740	106.99
80-90	2879	109.80	80-90	2719	106.17
90-95	2995	114.23	90-95	2832	110.58
95-100	3281	125.13	95-100	3213	125.46
ALL	2622	100	ALL	2561	100
Standard deviation	346.48			298.12	

Source: NSSO report, 2014

From the above data analysis this can be inferred that – there is a significant improvement in calories intake by the people of Odisha. Further, it has been also found that-inequality in calorie consumption has reduced substantially over the period of analysis. This improvement in calories intake may be contributed from different dimensions. This paper considered the changing food and nutritional policies in the state is one of the important factors to explain the above findings.

**Section II**  
**Food and Nutritional Policies in Odisha**

Public provisioning in the independent India started with the Constitutional commitments by the Government of India to ensure and promote the livelihoods of Indian citizens. Since

then various welfare schemes have been introduced especially to help the poor. The areas covered in those schemes include food and nutrition, education, health, housing and other contingent aspects. These schemes have been working since independence though in different names. The schemes which may promote nutritional security in Odisha are presented in table 8. The table depict that multiple strategies through various schemes have been adopted to improve the nutritional status of the people in the state. Though the implementation and functioning of those schemes are subject to targeting errors, functioning of the concern institutions and so on, yet the role of these public policies cannot be undermine to explain the improvement in calorie intakes of the people of Odisha.

Table 8: Introduction, objectives and functioning of different welfare schemes in rural and urban Odisha

Programs name & year of introduction	Objectives	Functioning
<b>Food and Nutrition</b>		
Public Distribution System (PDS), since 1939 but in an organized and large scale since 1950 onwards. Reforms in the schemes produced Revamped PDS (1992), Targeted PDS (1997) and Antyodaya Arna Yojona (AAY, 2000).	<ol style="list-style-type: none"> <li>1. Providing universal food security</li> <li>2. procuring food &amp; maintain a buffer stock</li> <li>3. Stabilise the food prices.</li> </ol>	It has been ensuring the food security to a larger sections of the poor though there have been different issues need to correct in the system. Such issues includes regional biasness, limited quantity of cereals, quality of cereals, targeting error etc.
Annapurna Schemes (2000-2001)	Meant for the indigent senior citizens or 65 years of age or above who though eligible for old age pension under the National Old Age Pension Scheme (NOAPS) but are not getting the pension, are covered and 10kgs of food grains per person per month are supplied free of cost under the scheme.	The total coverage under the scheme was 6,75,000 including the enhancement of 35,000 made during 2004-05. During 2006-07, Rs.8100.00 lakhs has been provided in the State’s Non-Plan Budget for payment of pension to the above targeted 6,75,000 beneficiaries under the scheme in Orissa

Mid-Day Meal (MDM) Scheme 15 <sup>th</sup> August, 1995	For the benefit of students in primary schools under Employment Assurance Scheme (EAS)/earlier Revamped Public Distribution System (RPDS) blocks (2368). The Scheme covers students of Class I-V in the Government Primary Schools / Primary Schools aided by Govt. and the Primary Schools run by local bodies.	The MDM in the state cover almost all the block but while in half of the total block (157) provides cooked meal in other half of the block they distribute dry food, which may affects the objective of achieving nutritional security.
Integrated Child Development Services, 1974-75	Aims to provide health care services covering supplementary nutrition, immunization, pre-school education, health checkup, referral services and health education to children within the age group of 0-6 years. In that process the scheme also try to provide nutritional support to the pregnant and nursing mother and health support to adolescent girls.	In Orissa there is an increasing tendency in the number of beneficiaries from ICDS.
MGNREGA, 2005	Boost purchasing power among the rural poor.	Started with 100 days of work to each interested household with Rs.100 per day.

**Section III**

**Conclusion**

The paper attempted to examine the calorie intakes by the people of Odisha vis-a-vis all India. It found that at the initial level, i.e. during 1972-73 the per capita per day calorie intake by the people of Odisha both in rural and urban area remained far below than that of all India. But over time such figure has changed significantly. By the year 2011-12, the calorie intake by the people of Odisha remained higher than that of all India both in rural and urban area. Such improvements have been related to state’s food and nutritional policies. However there might be other economic variable like increase in agricultural wage may explain such improvement better. However the paper concentrated in one element of protein calorie malnutrition (PCM). The other two elements – protein and fat intakes are also required to find out a clear picture of the PCM in the state.

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