

# Food Insecurity and Government Intervention for Sustainable Food Access in Odisha

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**Abstract:** - This paper aims to find out the status and causes of food insecurity and policy measures taken by the government to reduce insecurity in Odisha. The data used in this paper have been collected from different secondary sources like books, journals, news papers, government reports etc.

The study shows that the main cause of food insecurity in Odisha is absence of purchasing power of people to purchase adequate amounts of foods to meet basic minimum food requirements. Purchasing power is absent because of poverty. 9% of the population are extremely food insecure consuming less than 1800 kcl per day. The vulnerability is high in southern and northern regions of the state as well as among SC and ST communities and is more experienced in rural areas than urban areas.

Government of Odisha intervene the situation to counter insecurity through different measures like subsidized distribution of food grains, nutrition provisioning through Anganwadis and mid-day meals, food for work programmes etc. Because of implementation of these measures calories intake of people of KBK regions has increased from 1674.6 kcl in 2004-05 to 1819.0 kcl in 2011-12 and that of non-KBK regions has increased from 2046.5 kcl in 2004-05 to 2076 kcl in 2011-12. Finally, the paper suggests that the government should focus on development of agriculture and employment generation and price stability.

**Key Words:** Food insecurity, Purchasing power, Vulnerability, Calories intake, Price stability

## I. INTRODUCTION

Hunger is a world phenomenon. Throughout history, a portion of the world's population have often experienced sustained periods of hunger. Widespread hunger manifests itself in insufficient food intake and poor diet quality which results in malnutrition and mortality. These are resulted from insufficient food supply because of lack of production and lack of access by the people because of lack of purchasing power. Here comes the concept food insecurity which means non-availability of sustainable physical or economic access to enough safe, nutritious and socially acceptable food for a healthy and productive life. Food insecurity may be chronic, seasonal or temporary. As a result of food insecurity, people suffer from hunger and poor nutrition and therefore less likely to have healthy and productive lives. Nutritional consequences of insufficient food or under nutrition include

protein energy malnutrition, anaemia, vitamin A deficiency, iodine deficiency and iron deficiency. Food insecurity and malnutrition results in catastrophic amounts of human suffering. According to estimation of world health organisation approximately 60% of all childhood deaths in the developing world are associated with chronic hunger and malnutrition.

Food and nutrition have remained one of the darkest areas and the world has failed to tackle the situation completely. Food insecurity as also malnutrition looms large in certain regions and in certain population groups calling for food-based activities. This kind of activity is based on "development needs assessments" (as distinct from emergency needs assessment) and form an important component of "Food aid for Development" that formed a part of specific recommendations of Berlin Statement (International Workshop on Food Aid Contributions and Risks to Sustainable Food security - Sept. 2 - 4, 2003 at Berlin, Germany). The quality Human Capital is seriously affected by food and nutrition deficiencies and, unless tackled early, may pose a serious obstacle to sustainable development. Adolescents and adults also suffer from food insecurity. Non-availability of food results malnutrition which leads to decreased energy levels, delayed maturation, growth failure, impaired cognitive ability, diminished capacity learn, decreased ability to resist infections and illness, shortened life expectancy, increased maternal mortality and low birth weight.

Food insecurity may also result in severe social, psychological and behavioural consequences. Food insecure individuals may manifest feelings of alienation, powerlessness, stress and anxiety, may experience reduced productivity, reduced work and income earnings. All these may lead to anger, pessimism and irritability. Food insecure children may also show signs like higher level of aggressive or destructive behaviour, hyperactivity, anxiety, difficulty with social interactions, increased passivity, poorer over all school performance, increased school absences, depression, suicidal behaviour etc.

Malnutrition and hunger, particularly during early foetal development and early childhood causes multi-generational downward spiral of poor health, poor performance in school and on the job, family stress and instability, lower income and

an unsustainable cost to a nation's economy. So it can be said that food insecurity is associated with physical and mental health of an individual.

To maintain a healthy life, it is recommended that people consume around 2200 kcl of food each day. But over 850 million people of the world are living on daily diets of much less than the recommended amount.

There are several reasons associated with food insecurity. The main cause behind food insecurity is poverty. Poverty makes it very difficult for people to grow their own food and also to buy enough food. The World Bank estimates that, nearly 1.5 billion people live on less than 1\$ day, which is internationally recognised standard for measuring poverty. They are unable to buy enough food to keep them healthy.

The second leading cause of food insecurity is the growth of human population. The human population has been growing steadily and the amount of food needed to feed the population has also increased. Overall the human population is expected to increase by about 2 billion by 2050 and this will put a serious strain on the availability of food. Although currently enough food is produced to feed every human on earth as population grows, the amount of people suffering from food insecurity will increase. The increase in population will be particularly difficult in poor countries where people already struggle to obtain food and will have more trouble as population increases.

The third reason for food insecurity is non-availability of food grains because of decrease in production of food grains and illegal hoarding by erring traders and occurrence of natural calamities. But now-a-days steps are being taken to raise food production and non-availability or shortage of foods due to illegal hoarding and occurrences of natural calamity is a temporary phenomenon.

There are several methods in place to combat food insecurity. One method is to provide aid and relief to people or countries that are suffering. On the global scale, many poor countries have been given incentives by wealthier countries or organisations to increase their food production. The World Bank provides grants to poor countries to increase their agricultural systems and food supplies. Wealthy countries have also provided aid to poor countries by offering debt relief so that the country can spend money on producing its own food instead of paying back debt.

Another method for combating food insecurity is to use advances in technology, such as new farm equipments, fertilisers, pesticides and high-volume irrigation systems. New advances in genetics have also made it possible to produce more food by creating varieties of plants that have higher yields. There has also been an increase in the technology and techniques used to produce large amounts of livestock and fish.

Another effort is price stabilisation and taking action against illegal hoarding of food grains by erring traders. Immediate high rise of prices by black marketers should be stopped which reduces purchasing capacity of low income people.

Though India was successful in achieving self-sufficiency by increasing its food production and also improved its capacity to cope with year to year fluctuations in food production and also improved its capacity to cope with year to year fluctuations in food production, it could not solve the problem of chronic household food insecurity. The total food grains production has increased from 50.8 million tonnes in 1950-51 to 265 million tonnes in 2013-14 (Ministry of Agriculture, Govt of India). But in 2012, 21.92% of the total population in India fell below the national poverty line (On the basis of monthly per capita expenditure). This is the main cause of food insecurity in India.

Because of food insecurity resulting from poverty, in 2001-03 in average 20% of the total population of India was undernourished. The average calorie consumption marginally increased from 2370kcl during 1990-92 to 2470 kcl in 2002-04 (FAO STAT). To address wide spread poverty, food insecurity and vulnerability, the govt of India has since independence implemented multiple initiatives such as the integrated child development services (ICDS) programme, the national health programme, NREGS, national plan of action on nutrition, Public distribution system, Mid day meal, Anganawadi etc. The govt of India provides subsidised food grain under its public distribution system which is amongst the largest food security programmes in the world. The national food security act 2013 (also right to food act) is an act of parliament of India which aims to provide subsidized food grains to approximately two thirds of India's 1.2 billion people.

## *1.2. Indicators of food insecurity*

### *1.2.1. Food security outcome index (FSOI)*

In developing countries, the rural population, particularly children, is vulnerable to malnutrition because of low dietary intake, lack of appropriate care and inequitable distribution of food within the household. The measurement of the nutritional status of children is done through anthropometric methods; these include weight-for-age, height-for-age and weight-for-height. Each of these indices provides somewhat different information about the nutritional status of children.

1. Weight-for-age is considered to be 'underweight'. Proportion of underweight children as the indicator for capturing malnutrition among children has been taken as an indicator to measure food insecurity because:

- Weight-for-age is a composite measure that takes into account both chronic and acute under-nutrition.

- The Reproductive and Child Health Survey through its District Level Household Survey (DLHS) does give information at the district level about this indicator

2. Under-five mortality has been taken as the second indicator for measuring food insecurity. The under-five mortality rate indicates the probability of dying between birth and five years of age, expressed per thousand live births. The advantages of this indicator are that:

- Mortality among children is known to be the 'outcome' of the development process rather than an 'input', such as per capita calorie or protein consumption or access to medical facilities which are means to an end. Child mortality is known to be the outcome of a wide variety of factors, for instance, nutritional status of the child and its mother, food availability in the family, level of immunization, availability of maternal and child health services, economic status, availability of safe drinking water, basic sanitation, and so on (UNICEF, 2005).
- The significance of under-five mortality as an indicator lies in the fact that it is less susceptible to the fallacy of averages than, for instance, per capita income. To put it simply, it is much more difficult for a wealthy minority to affect a region's child mortality ratio, and therefore it puts forward a more accurate picture of the health and nutritional status of the children of that region (UNICEF, 2007).

Two indicators have been used to derive FSOI of the state of Orissa. These are under five mortality and underweight children status.

### 1.2.2. Food security index (FSI)

However, food security indicators can draw attention to the factors that distinguish the food secure from the food insecure districts. These indicators can point out the specific areas in which the food insecure districts differs the most from food secure districts. Of course, such association between indicators in an index cannot tell us what the causal relation between them and food security is. For instance, if we find that adult female literacy is consistently higher in food secure districts and consistently lower in food insecure districts that only show a correlation between adult female literacy and food security. There are a number of indicators that influence food insecurity in one way or the other. These indicators have been combined into a set of three broad food security indices:

1. Production factors (at the district level) influencing *availability*;
2. Household and individual *access* to food; and
3. Ability to *absorb* food.

Last but not the least; the FSI is a composite index covering three dimensions, i.e., Availability, Access, and Absorption factors. Districts having higher index value are considered relatively more food secure compared to districts with lower index values. All variables included in the index are for rural areas, unless otherwise specified. Besides these three groups of factors, an additional component, i.e. public entitlement, has been used to explain how this influences food security. But the public entitlement factor is not included in the index of food security. The reason is that public entitlements enter to make up for deficiencies in normal, private entitlements. The lower the level of food security, the greater should be public entitlement. For each of the dimensions, as discussed earlier, some relevant variables have been chosen. All indicators used to calculate the composite index should be positively related to the index. In order to do that, some of the variables have been reversed.

## II. OBJECTIVES OF THE STUDY

This paper concentrates on the state of Odisha which is amongst the poorest states of India suffering from "alarming" levels of hunger (Menon et.al 2009). According to planning commission 32.59 % of total population are below poverty line in Odisha. The paper has following objectives.

- a) To find out status of food insecurity in Odisha and its causes.
- b) To highlight policy measures taken by the government of Odisha to reduce insecurity.

## III. METHODOLOGY

To conduct study, data have been collected from secondary sources like books, journals, newspaper, magazines and web pages.

## IV. SOCIO- ECONOMIC PROFILE OF ODISHA

Orissa lives in villages. (Misra, S.N. (2005) as per 2001 census, 85.01 per cent of the total population of the state lives in rural areas. The state of Orissa, created on the 1st April, 1936 in pursuance of government of India (constitution of Orissa) order 1936. Presently, it has 30 districts. The state is one of the backward states in India with per capita income Rs 25891 in 2013-14 at 2004-05 prices being placed in 24<sup>th</sup> position in highest to lowest order. Delhi is placed in first position with per capita income Rs 127667. Assam, UP and Bihar are placed below Odisha with per capita income Rs 24533, Rs 19234 and Rs 15650 respectively. Though, along with the states of Bihar, Jharkhand, Chhattisgarh and Madhya Pradesh, Orissa is one of the most mineralised states in India. Its share in all-India estimated stock of some important minerals are is Bauxite(59.50 per cent) , Chinaciy (31.50 per cent), Chromites (98.40 per cent), Coal(24.80 per cent), Dolomite(17.90 per cent), Graphite(71.00 per cent), Iron

Ore(32.90 per cent), Limestone(2.10 per cent), Manganese Ore(67.60 per cent)( Orissa Development Report, 2002.) The state occupies of 4.74 per cent of India's landmass, 36.71 million people as per 2001 census, accounts for 3.57 per cent of the population of the country. The quality of soil, in general, is rather low, except in the coastal districts which contain highly fertile alluvial soil and the soils of the river valleys. This is a natural weakness of the state's economy as agriculture is its mainstay. It contributes 28 per cent of the net domestic product of the state. Furthermore, 65 per cent of the total population directly or indirectly engaged in agriculture for their livelihood and occupation. (S.P. Panda (2005).

As per socio-economic status of the State, it can be divided into two broad regions, i.e. the coastal region and inland districts. The former is fertile with high yielding capacity of agriculture comprising high proportion upper-caste population. On the other hand, the inland districts are hilly and barren land with covering of forest; comprising ST and SC population with primitive stage of economic. It is needless to mention that socioeconomic backwardness of a region is the root cause of mass poverty. As such the incidence of rural poverty in Orissa is found to be highest in India. In such scenario, it is, further, observed that the incidence of rural poverty in the KBK districts of Orissa is found to be more acute. This is clearly revealed from the poverty survey of the rural households conducted by the Panchayat Raj Department, Government of Orissa in 1992. (Socio-Economic Survey of Rural Households, 1992, Panchayat Raj Department, Government of Orissa) Poverty manifests itself in the form of "absolute poverty" that prevails in a state of Orissa (39.9 per cent BPL). Poverty is spatially concentrated in Orissa. Some regions such as southern Orissa are very poor, 89.14 per cent (NSS data 1990-2000). The nature and structure of the regions and human resources engagement in developmental programmes reflects state's progress and poverty level. The unequal distributional pattern of landholdings, ownership of assets and the agricultural productivity indicate the degree of progress and the level of poverty. Orissa is not only experiencing unequal distribution of land, assets and productivity but also vulnerable to repeated natural calamities like droughts, floods, and cyclones. The recurrent visitation of natural calamities further exacerbates distress of the people, particularly small and marginal farmers and landless labourers. A disproportionately large proportion of STs and SCs population in western and southern Orissa live rather precariously with very low economic base. The poverty reduction level is not in satisfactory, even after accelerated measures taken to address their poverty, especially women and children are generally worst sufferer in these regions

. In Orissa, regions like the southern and northern are not well developed as compared to the coastal region. One of the important reasons for this is the higher concentration of unfertile land and STs Population. In 1983, the percentage share of ST population in the coastal region of rural Orissa

was 7.2 per cent, whereas, it was as high as 39.7 per cent in the southern region and 34.5 per cent in the northern region. The poverty ratio in the coastal region was estimated at 64.0 per cent as against 85.5 and 79.1 per cent in the southern and northern regions respectively. The incidence of poverty among SC population was more or less same in all the three regions, i.e., 61-64 per cent. In case of general caste population, the incidence of poverty was comparatively much less in the coastal region than that in the southern and northern regions. Thus, in all the cases, the poverty ratio was found to be less in the coastal region. A large number of rural communities, particularly in the hilly terrains of western and southern Orissa are physically excluded for want of connectivity and other infrastructural support (i.e., markets, urban areas, and road connectivity). As a result the poor in general and STs & SCs people in particular lack access to growth centres and service centres (i.e., schools, hospitals). Rural poverty is the highest in Orissa. Rural people depend mostly on agriculture and forest resources to eke out their subsistence.

However, agricultural growth has been historically generally very low. Agricultural Productivity is roughly half that of the national average. Due to lack of purchasing Powers of farmers, use of improved inputs (e.g., better seeds and fertilizers) is also far below the national average. Employment opportunities are rather very limited. Though extensive forest resources are important source of substance to majority of rural poor, they are highly degraded and lack desired financial and managerial inputs. Large forest areas are devoid of regeneration and therefore, cannot provide livelihood support on sustained basis unless substantial investments are made in them. Want of adequate irrigation facilities (except in certain pockets) is another limiting factor that keeps agriculture under developed. Orissa lacks high quality infrastructure (e.g., railways, paved roads, ports). Optimal exploitation of its vast natural resources demands heavy investments In infrastructural development, and the state government's capacity to develop infrastructure is very limited.

Odisha has historically witnessed higher incidence of poverty. In recent years Odisha has been able to reduce poverty at faster rates. As per estimates made by the Planning Commission based on the Tendulkar Committee methodology, poverty in Odisha declined by 24.6 percentage points from 57.2 percent in 2004-05 to 32.6 percent in 2011-12. This was the highest poverty reduction by any major State in the country.

## V. FOOD INSECURITY IN ODISHA

There are a number of indicators that influence food insecurity in one way or the other. These indicators are 3 As – Availability, Access, and Absorb. In context to State of Orissa, a combination of economic, social, ecological and institutional factors contribute to food insecurity. (ENVIS

Newsletter, Centre for environmental studies, vol -24).  
Especially socio- economic factors are more responsible for

food insecurity.

### 5.1. Poverty

**Table – 1: Incidence of Poverty in Odisha vis-à-vis other Major States, 1973-74 to 2011-12 in %**

States	1973-74	1977-78	1983	1987-88	1993-94	2004-05*	2009-10*	2011-12*
Andhra Pradesh	48.86	39.31	28.91	25.86	22.19	29.90	21.10	9.20
Bihar	61.91	61.55	62.22	52.13	54.96	54.40	53.50	33.34
Gujarat	48.15	41.23	32.79	31.54	24.21	31.80	23.00	16.63
Haryana	35.36	29.55	21.37	16.54	25.05	24.10	20.10	11.16
Karnataka	54.47	48.78	38.24	37.53	33.16	33.40	23.60	20.91
Kerala	59.79	52.22	40.42	31.79	25.43	19.70	12.00	7.05
Madhya Pradesh	61.78	61.78	49.78	43.07	42.52	48.6	36.70	31.65
Maharashtra	53.24	55.88	43.44	40.41	36.86	38.10	24.50	17.35
Odisha	66.18	70.07	65.29	55.58	48.56	57.20	37.00	32.59
Punjab	28.15	19.27	16.18	13.2	11.77	20.9	15.9	8.26
Rajasthan	46.14	37.42	34.46	35.15	27.41	34.4	24.8	14.71
Tamil Nadu	54.94	54.79	51.66	43.39	35.03	28.9	17.1	11.28
Uttar Pradesh	57.07	49.05	47.07	41.45	40.85	40.9	37.7	11.26
West Bengal	63.43	60.52	54.85	44.72	35.66	34.3	26.7	19.98
All India	54.88	51.32	44.48	38.36	35.97	37.2	29.8	21.92

\* Based on MRP consumption, Tendulkar Committee methodology Source – Odisha Economic survey 2014-15

Poverty is most important economic factor for food insecurity in Odisha. The table – 1 shows that 32.59% of total population live below poverty line. Though poverty has declined from 66.18% in 1973-74 to 32.59% in 2011-12 the state still stands in 2<sup>nd</sup> position in highest to lowest order next to Bihar while national rate is 21.92 %. As per estimation of national sample survey in its 68<sup>th</sup> round survey in 2011-12, the per capita monthly consumption expenditure of people below poverty line in rural Odisha is less than Rs 695 and that of urban Odisha is less than Rs 861. With such expenditure they are not able to have two square meals per day.

**Table- 2: % of poverty in rural & urban Odisha**

Year	Reference Period	Rural	Urban	Total
<b>Expert Committee Methodology</b>				
1973-74	URP	67.28	55.62	66.18
1977-78	URP	72.38	50.92	70.07
1983	URP	67.53	49.15	65.29
1987-88	URP	57.64	41.53	55.58
1993-94	URP	49.72	41.64	48.56
2004-05	URP	46.80	44.30	46.40
<b>Tendulkar Committee Methodology</b>				
1993-94	MRP	63.00	34.50	59.10
2004-05	MRP	60.80	37.60	57.20
2009-10	MRP	39.20	25.90	37.00
2011-12	MRP	35.69	17.29	32.59

\*URP – Uniform Recall Period Method, MRP – Mixed Recall Period Method  
Source – Odisha Economic survey 2014-15

The table 2 shows that poverty is more concentrated in rural areas. In 2011-12 the rural poverty is 35.69% and urban poverty is 17.29%. Rural and urban poverty have declined but still rural poverty is higher than urban poverty.

The estimates of poverty from 1973-74 to 2004-05 are based on NSS data and Expert Committee Methodology and those for the year 1993-94, 2004-05, 2009-10 and 2011-12 are also based on NSS data and Tendulkar Committee Methodology. Poverty estimates for 2011-12 have been obtained by using the data from 68<sup>th</sup> NSS round and on the basis of poverty lines of Rs.695 and Rs.861 as monthly per capita consumer expenditure for rural and urban Odisha, respectively.

**Table -3: % Of poverty in Social Classes for Rural Odisha, 2004-2012.**

Year	ST	SC	OBC	Others	Total
2004-05	84.40	67.90	52.70	37.10	60.80
2009-10	66.00	47.10	25.60	24.50	39.20
2011-12	63.52	41.39	24.16	14.20	35.69

Source – Odisha Economic survey 2014-15

The table 3 shows that Scheduled Tribe (ST) communities are poorer than other social classes followed by Scheduled Caste (SC) communities. It is heartening to note that in recent years, poverty among ST and SC communities has been reducing at a faster rate, i.e., 20.88 and 26.51 percentage points respectively from 2004-05 to 2011-12.

**Table - 4: % of poverty in NSS Regions, Rural Odisha, 2004-2012**

Year	Southern	Northern	Coastal	Total
2004-05	73.40	70.50	41.60	60.80
2009-10	52.40	41.70	25.30	39.20
2011-12	48.00	39.97	21.65	35.69

Source – Odisha Economic survey 2014-15

Poverty estimates for rural Odisha by NSS regions (i.e., southern, northern and coastal) as per the Tendulkar Committee methodology are presented in Table 4 for 2004-05, 2009-10 and 2011-12. It may be observed that the southern region which includes the KBK region (i.e., Kalahandi, Bolangir and Koraput districts), has the highest incidence of poverty followed by the northern region. From 2004-05 to 2011-12, all these regions have witnessed substantial reduction of poverty as may be observed from Table 4. Among the regions, the northern region has registered the highest reduction of poverty with 30.53 percentage points, followed by the southern region with 25.40 percentage points and the coastal region with 19.95 percentage points.

The above data indicate that poverty is concentrated in rural Odisha which is twice than that of urban Odisha. While in rural Odisha it is 35.69 %, in urban Odisha it is 17.29 %. The ST community having poverty ratio 63.52 % is more vulnerable followed by SC community with poverty ratio 41.39 %. The data further show that southern region is more vulnerable to poverty which includes KBK areas. So it can be said that severe food insecurity in Orissa is primarily due to the presence of vulnerable rural population who are basically Schedule Caste & Schedule Tribe with poor & marginal livelihood assets or livelihood susceptible to natural disasters.

**Table - 5: Status of districts of Odisha as per Food Security Outcome Index (FSOI)**

Secure	Moderately Secure	Moderately Insecure	Severely Insecure	Extremely Insecure
Jharsuguda	Nayagarh Cuttack Jagatsinghpur Balasore	Dhenkanal Mayurbhanj Puri Kendrapara Deogarh Angul	Bolangir Nabarangpur Jajpur Sambalpur Sonepur Sundargarh Keonjhar Bhadrak Bargarh Boudh Kalahandi Ganjam Koraput	Nuapada Rayagada Gajapati Malkangiri Kandhamal

Source - Food Security Atlas of Rural Orissa

Indicators used to Compute Food Security Outcome Index (FSOI) are under age five year mortality and underweight children.

**Table - 6: Status of Districts in Terms of FSI**

Extremely Insecure	Severely Insecure	Moderately Insecure	Moderately Secure	Secure
Kandhamal, Gajapati Rayagada Nabarangapur	Koraput Sundaragada Mayurabhanja Malkangiri Sambalpur	Dhenkanal Jharsuguda Ganjam Sonepur Nayagarh	Kendrapara Jajpur Balasore Bargarh Khordha	Bhadra k Puri Jagatsin ghpur

	Deogarh Baudh Keonjhar Angul Nuapada Kalahandi Balangir		Cuttack	
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Source - Food security atlas of rural Odisha

Food security indexes have been developed on the basis factors such as availability, access and absorption of food. There is an overlap between the ranks of districts on the food security outcome index and the ranks on the food security index . That is, do the districts that have poor outcomes (in terms of under-five mortality and underweight children) also have low availability, access and absorption? If indeed there is an overlap, and we show that there is, it means that the factors or indicators that are included in the composite FSI do, indeed, contribute to food insecurity, and any strategy to improve the food security status must address them . The simple correlations between the food security outcome index and the food security index show a positive and significant correlation. In other words, while correlations do not tell us the causal factors, they do tell us the correlates to food insecurity. Districts that have the highest child mortality and underweight children are also the districts that have a high proportion of SC and ST population, high proportion of agricultural labourers (showing landlessness and poverty), low irrigation, low road connectivity and so on.

**5.2. Agricultural Trends, Food Availability, Markets and Access**

Orissa has a highly varied agro-ecological profile which can usefully be divided into four zones consisting of: (i) Northern Plateau (hill ranges rising to elevations of 2000 to 3000 feet above sea level (ii) Central Table (generally flat and undulating) (iii) Eastern Ghats (hill ranges rising to 2000 feet) and (iv) Coastal Plains (river deltas).

While highland areas constitute almost 50 percent of the state’s cultivated area, the relative fertility of soil in these areas is very low, with other features including poor moisture retention and susceptibility to erosion. The result is that cultivation in the highlands is mainly restricted to low water intensive crops, whereas the alluvial soil of the lowlands is more suitable for paddy cultivation. The coastal region presents an essentially mono-cultural cropping landscape. By contrast, hilly forested areas (mainly bamboo and forests) yield a wide range of ‘minor’ products and hold the state’s major mineral deposits. In recent years, degraded forested areas have resulted in more droughts and floods state wide due to more rapid run off of rainwater in the hills and increased sediment load at the delta channels. The coastal areas of Orissa are also highly susceptible to cyclones originating in the Bay of Bengal.

The long-term rate of agricultural growth has been significantly lower than those of the secondary and tertiary sectors and growth in agriculture and animal husbandry has actually slowed down in the course of the 1990s to about two percent (Calculated by DJ Research Consultancy from CSO National Accounts Statistics (NAS) data. )

As earlier noted, high poverty levels in Orissa are tied to low land productivity and low agricultural wages. Constraints to agricultural growth and restricted access to credit in turn restrict the ability of farmers to invest in technologies for crop diversification resulting in an unusually high share of paddy in total output (90 percent of crop area and 80 percent irrigated area). Strikingly, rice yields fall short of the national level reflecting low agricultural productivity as shown in table below.

Table- 7: Food production

Food Production	Orissa	India
Per capita food production (KG)	164	209
Rice yield (KG/HA)	1210	1930
Food grain yield (QT/HA)	10.8	16.2

Source: Directorate of Food Production and Directorate of Statistics, Orissa and Directorate of Economics and Statistics, Ministry of Agriculture, Government of India

Despite low levels of agricultural productivity, the principal source of food supplies in Orissa is food grain production with intra-state imports of food grains (commercial and public distribution) constituting a marginal proportion of total consumption. Currently, based on the levels of household demand for food (using NSSO consumption data), Orissa is virtually self-sufficient based on the level of household demand in food grains.( Regional Office of the Food Corporation of India, Bhubaneswar )

The Government of Orissa Poverty Task Force defines extreme food insecurity in terms of calorie intake as per capita per day being below 1800 kcal. Using this definition, the proportion of the population considered extremely food insecure has been measured on the basis of various geographical and socio-economic categories as shown in Table 8 below:

Table - 8 : Proportion of Various Socio-economic Categories Classified as Extremely Food Insecure

Specified Population and Group	Proportion of extremely food insecure
Coastal	3.4
Northern	9
Southern	14.8
Agricultural labour	11.8
Non-agricultural Labour	10.9
Cultivator	8.7

Other labour	5.8
Self Employed	3.4
Regular salary earner	1.6
Male head of household	8.6
Female head of house hold	9.7
SC	7.8
ST	16.5
Odisha as a whole	8.6

Source: Tripathy and Misra (2004)

There is significant variance in food grain production from year to year (ranging from 5 to 7.3 million MT between the year 1993-1994 to 2001-2002 for instance) because of droughts and other natural disasters. The effect of seasonal variations and its related consequences for higher prices and lower employment and wages hit poorer and more food insecure households the hardest. Aside from unpredictable shocks, the lean season for Orissa tends to be from July to September, during which time almost four fifths of the population may face some food shortages.

One important factor leading to food insecurity and vulnerability in Orissa is the limited asset base. Landless labourers typically have significantly lower asset levels relative to all other groups while small-scale farmers generally have the highest asset level. (Understanding Dynamics of food insecurity And Vulnerability in Odisha by Food And Agriculture Organisation, Italy)

### 5.3. Food Consumption, Utilization and Nutritional Status

Food insecurity causes malnutrition. Malnutrition is also caused by insufficient intake of micro-nutrients. An overview of key indicators for under nutrition and health in Orissa is provided below.

Table- 9 : Health and Nutrition Indicators for Women and Children in Orissa

Indicator	Odisha	India
Infant mortality per 1000 live birth	65	57
% of children 0 -3 year under weight	44	46

Source: Ministry of Health and Welfare (2006)

Table- 10 : Average nutrient intake in Odisha

	2004-05	2011-12
<b>Non-KBK districts</b>		
Calorie (Kcl)	2076.8	2046.5
Fat(grams)	49.0	48.6
Protein(grams)	18.3	23.4
Non Cereal calories(Kcl)	433.6	477.6
<b>KBK districts</b>		
Calorie (Kcl)	1674.6	1819.0
Fat(grams)	38.7	42.4

Protein(grams)	12.7	18.4
Non Cereal calories (Kcl)	278.7	383.2

Source: NSS 61 and 68

The table 9 shows that infant mortality rate is 65 per 1000 live birth in Odisha where as in national level it is 57. Table 10 shows that daily total calorie intake is lower in KBK regions than Non-KBK regions. In 2011-12, in KBK regions it was 1819 kcl where as in Non-KBK regions it was 2046.5 kcl. The protein, fat and non cereal calories intake is also lower in KBK districts than Non- KBK districts.

#### VI. GOVERNMENT INTERVENTION FOR REDUCING FOOD INSECURITY AND VULNERABILITY

Government intervention is necessary to reduce food insecurity. The policy measures of government to counter insecurity is based on - Subsidized distribution of food grains, Nutrition provisioning through Anganwadis/midday meals, Food for work programme.

There are both central and state funded public programmes that directly address poverty, food insecurity and malnutrition. Orissa, as one of India's poorest states with some of the most significant pockets of malnutrition, receives considerable support from the central government through different schemes. There is a broad range of programmes, but the most significant are the National Rural Employment Guarantee Scheme (NREGS) and the Integrated Child Development Scheme (ICDS), consumer food subsidy through Public distribution system, Mid-day meal.

The NREGS constitutes a legal commitment to provide an annual guarantee of 100 days employment for every rural household in which adults are willing to do manual labour at the minimum wage.

ICDS, the largest programme of its kind in the world, targets the most vulnerable groups within the population including children up to six years of age, pregnant women and nursing mothers belonging to the poorest of the poor families and living in disadvantaged areas including rural areas, tribal areas and urban slums. The objectives of the scheme are:

- To improve the nutritional and health status of pre-school children in the age group of 0 to 6 years;
- To lay the foundation for the proper psychological development of the child;
- To reduce the incidence of mortality, morbidity, malnutrition and school drop-outs;
- To achieve effective coordination of policy and implementation among the various departments to promote child development; and

- To enhance the capability of the mother to look after the normal health and nutritional needs of the child through proper nutrition and health education.

ICDS provides a package of services, consisting of supplementary nutrition, immunization health check-up, referral services, non-formal pre-school education, and nutrition and health education through different centres called Anganawadi.

Consumer food subsidy is an important policy instrument for nutritional assistance not only in India but also in many low income countries. The government of India provides subsidized food grains to the poorer households under its Public Distribution System (PDS) which is amongst the largest food security programs in the world. The National Food Security Act, 2013 (also Right to Food Act) is an Act of the Parliament of India which aims to provide subsidized food grains to approximately two thirds of India's 1.2 billion people.

In mid day meal scheme nutritious foods are provided to school children in the state.

The predominantly tribal districts of Koraput, Bolangir and Kalahandi (known as the KBK districts) are also the recipients of a number of parallel special schemes covering multiple aspects of the rural economy. The Revised Long Term Action Plan (RLTAPT) provides a significant level of resources to the districts and covers natural resource management, construction of infrastructure, livelihood support and investment in safety nets. Issues relating to the recognition, protection and promotion of sustainable tribal livelihoods and food security are significant to the development discourse in Orissa. In the face of increasing threats to the livelihood security of forest dependent tribal communities, Joint Forest Management (JFM) Guidelines (issued in 1993) have been officially adopted as the core of the New Forest Policy (NFP, 1998) and involve, through the Vana Surakhya Samiti (VSS), programmes such as the assertion of tribal rights to collect NTFPs and enhanced responsibilities of local elected village councils (Panchayat Raj Institutions). Food security is being provided through heavily subsidized rice at the rate of rupee one a kg for all BPL households in non-KBK and KBK regions Targeted public distribution system, Antyodaya Anna Yojana (AAY), Mid-day meal programme, Emergency feeding programme (EFP) supplementary nutrition programme (SNP) and AAHAR programme are implemented in state.

#### VII. CONCLUSION AND SUGGESTION

It can be concluded that poverty is the main cause of food insecurity in Odisha as 32.59% of total population are below poverty line. Food insecurity is more in rural areas and in southern region which includes KBK districts. 35% of rural population is below poverty line where as in urban it is



17.29%. ST community is more vulnerable followed by SC community. 63% ST and 41% of SC community are below poverty line. People of kbk district consume average 1890kcl where as in non-kbk districts, it is 2046kcl. Agricultural laborers are most vulnerable. Govt intervenes with subsidized distribution of food grains, Nutrition provisioning through Anganwadis/midday meals, Food for work programme etc.

In order to achieve household food security in present time the following steps should be taken.

- a) Accelerating growth in food and agriculture sectors so as to provide direct sources for food and income for buying food.
- b) Policy of growth with equity should be implemented
- c) Promoting rural development with special focus on poor
- d) Raising employment opportunities
- e) Provision of cheap credit for poor households for self employment
- f) Stabilising supply of food and its prices
- g) To improve plan for emergency preparedness so as to provide food during natural calamities.
- h) Right beneficiaries under different schemes of food security should be chosen.

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