Food and Nutrition Security in Odisha: A Case Study of Three Villages of KBK Region

A Thesis Submitted to the University of Hyderabad
in Partial Fulfillment of the Requirements for the Award of

DOCTOR OF PHILOSOPHY
IN
ECONOMICS

By

PRASANTA KUMAR DAS
Registration No. 12SEPH11

Thesis Supervisor
Dr. G. Sridevi

हैदराबाद विश्वविद्यालय
University of Hyderabad

प्रतिष्ठित संस्थान
INSTITUTION OF EMINENCE
राष्ट्रीय अपेक्षाएँ, वैश्विक मानक
National Needs, Global Standards

SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
HYDERABAD- 500046 (INDIA)
DECEMBER 2021

DECLRATION

I, Prasanta Kumar Das, hereby declare that the thesis entitled, **"Food and Nutrition Security in Odisha: A Case Study of Three Villages of KBK Region"** submitted by me under the supervision of Dr. G. Sridevi, **School of Economics, University of Hyderabad,** is a bonafide research work which is also free from plagiarism. I also declare that it has not been submitted previously in part or in full to this University or any other University or Institutions for the award of any degree or diploma. I hereby agree that my thesis can be deposited in Shodhganga/INFLIBNET.

A report on plagiarism statistics from the University Librarian (IGML) is enclosed.

Prasanta Kumar Das

Prasanta Kumar Das
Regd. No. 12SEPH11

Date: 10/12/2021
Place: University of Hyderabad

CERTIFICATE

This is to certify that the thesis entitled "**Food and Nutrition Security in Odisha: A Case Study of Three Villages of KBK Region**" submitted by **Prasanta Kumar Das,** bearing **Reg. No. 12SEPH11** in partial fulfillment of the requirements for the award of the Degree of **Doctor of Philosophy in the School of Economics**, is a bonafide work carried out by him under my supervision and guidance.

This thesis is free from plagiarism and has not been submitted previously in part or in full to this or any other Universities and Institutions for the award of any degree or diploma.

A part of this thesis has been:

A. Published in the following Publications:

1. Sridevi G. and Prasanta. Kumar. Das (2017).'**Socio-Economic Condition of Tribal People in Odisha with Special Reference to Rayagada District**.'DeshVikash Publication, Vol. 4, Issue 2, pp. 1-12, July-Sept. 2017.
2. Sridevi G. and Prasanta. Kumar. Das (2017). '**Public Distribution System in Orissa: A Study of Two Villages in the Mayurbhanj District.**' JIM QUEST, Journal of Management and Technology. Vol.13, No.1, Jan-June, 2017.

B. Presented in the following Conferences:

1. Presented a Paper in the National Economics Conference- 2013 on '**Public Distribution System in Odisha; A Case Study of Two Villages in Mayurbhanj District.**' Organized by the Young Economist School, University of Hyderabad, Hyderabad, 10^{th} – 12^{th}May 2013.

2. Presented a Paper in 34th National Conference of Agricultural Marketing- 2017 on **'The Economic Contribution of Forest Resources to the Tribal Communities in Odisha: A Study of Two Villages in Rayagada District.'** Organised by the Department of Economics, BabasahebBhimraoAmbedkar University, Lucknow and Indian Society of Agricultural Marketing, Hyderabad, 16th – 18th March 2021.
3. Presented a Paper in Virtual 4th National Conference on Sustainable Development Goal: Lessons and Challenges in the VUCA World, **'Issues of Socio-Economic Conditions of the Tribal People in Odisha with Special Reference to Rayagada District'** Organized by the Amity School of Economics, Amity University, Noida, 18th – 19th March 2021.

Further, the student has passed the following courses towards fulfillment of the coursework requirement for Ph.D.hence exempted from doing coursework (recommended by Doctoral Committee) on the basis of the following courses passed during his M.Phil. Programme and the M.Phil.degree was awarded:

Course Code	Name	Credits	Pass/Fail
1. SE600	Advanced Economic Theory	4	Pass
2. SE601	Social Accounting and Data Base	4	Pass
3. SE602	Research Methodology	4	Pass
4. SE620	Study Area	4	Pass

Supervisor

Dr. G. Sridevi

SUPERVISOR
SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
Hyderabad-500 046. (INDIA)

Date: 10/12/2021
University of Hyderabad

Dean

DEAN
SCHOOL OF ECONOMICS
UNIVERSITY OF HYDERABAD
Hyderabad-500 046. (INDIA)

School of Economics

ACKNOWLEDGEMENT

This dissertation is completed with help and cooperation of certain people and various Institutions. Here I wish to acknowledge their contribution in working out of this dissertation.

To start with, I express my immense gratitude to the person who has not only been my supervisor but also my role model, Dr. G. Sridevi, I take this opportunity to thank her for having introduced me to an important area of research like working of Food and Nutrition Security with special emphasis on the tribes and encouraged me at every step thereafter through her valuable suggestions and advices. This work would never have reached its logical end without her presence and guidance at every moment.

I thank Prof. Phanindra Goyari and Prof. K. Laxminarayana for being my doctoral committee members and giving valuable inputs from time to time which has certainly helped in the improvement of my thesis. My profound sense of gratitude is due to Prof. R. V. Ramana Murthy, Dean, School of Economics, for his kind co-operation. I convey my sincere thanks to all the faculty members of our school who directly or indirectly contributed to my research work.

I deeply convey my thanks to Prof. E. Revathi, the Director of CESS, Hyderabad for her valuable contribution in completing my thesis. I thank Prof. S. Galab for his valuable suggestions and comments for contributing to my research work. I also thank to ICSSR and CESS for the financial support.

I thank the staff of the School of Economics and I.G.M. Library, and special thanks to CESS Library, CSD Library, Hyderabad, CSD Library, Hyderabad, GIDR Library, Gujarat, JNU Library, New Delhi and NCDS Library, Odisha for providing relevant material for my thesis work.

I also owe to the Sarpanchs of the three Gram Panchayats and Ward Members for their helping hand towards me throughout my field survey and a much special thanks to the people of the three villages. I also thank the Block Development Officers of three blocks for their helps.

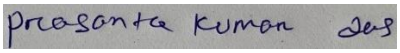
I consider myself pledged enough to have polite and well-manner senior Bharati Bhai, Tapan Bhai, Bapi Bhai, Ramu Bhai, Bhim Bhai, Lucky Bhai, Pratusha bhai, Jaga Bhai, Soumendra

Bhai, Ajit Bhai, Rajesh Bhai, Iswar Bhai, Ashok Bhai, Pratap Bhai, Balaji Ana, Subhra Bhai, Kirti Bhai, Mangulu Bhai, Dambur Bhai, Ambika Bhai, Sachi Bhai, Bibhuti Bhai, Jitu Bhai, Kulamani Bhai, Sarat Bhai, for their help and encouragements during theseyears.

I convey my hearty thanks to Tapan, Asish, Dillip, Sandeep, Jatadhari, Kedar, Susanta Nag, Pradeep Kamble, Tiken, Jamnejeya, Bishnu, Ajay, Ballav, Ranjan, Prasad, Ramji, Lima, Pulana, Venky, Meghanad, Kuldeep, Anju, Prasantha, Srinu, Balaji, Satish, Narendra, Priyadarshi, Anita, Rafiq, Gouranga, Nrushinga, Swayambar, Priyabrata, Dibakar, Arakhita, Lingaraj, Rajeeb, Chakradhar, Abhaya, Dinabandhu, Himadri, Rajendra Mallick, Soraj Panda, Manash Panigrahi, Ajit, Ramesh, Raj, Manasi, Pratap, Jagannath, Pradipta, Susanta Sethy, Ranjeet, Abhas, Dhiru, Bijay, Manas Kanjilal, Dhruba, Rajendra Khara, Anirudh Jena, Nihar, Kali, Tanmay, Abinash, Dillip Muduli, Trinath, Anadi, Liza, Nitya, Jayakrushna, Gorachand, Suman Dhaneswar, Laba, Sudam, Anirudh Nayak, Kunal, Sumit, Pravat, Padia, Bhaibav, Krushna Chandra, Chinmaya, Rituraj, Golakh, Sandeep Rout, Satish, Krushna, Aswin, Subasish, Satya, Prakash, Bhaibav, Prakash Lenka, Himanshu, Rakesh, Partha, Sourav, for their cooperation, suggestions, and comments throughout my study; this helped me to complete my thesis.

Once again I especially thanks to Bharati bhai, Soumendra bhai, Kirti bhai, Subhra Bhai, Dambaru Bhai, Pratap bhai, Sachi bhai, Jitu Bhai, Tapan, Sandeep, Dilip Majhi, Jatadhari, Ranjan, Alekh, Raj, Pratap Nayak, Dilip, Dhruba, Dhirendra, Anirudh, Abhas, Partha, Sourav, Swayamsikha, their constant support encouraged me in every facets to complete my thesis.

Last but not the least great thank to my family members and my villagers, particularly to my parents and sister for their advice, virtue of honesty, sacrifice, and years of struggle and hard work, which made complete my thesis.



Prasanta Kumar Das

Date: 10/12/2021

Place: University of Hyderabad

CONTENTS

Chapter- II

Review of Literature on Food and Nutrition Security

Chapter-III

Changing Agrarian Structure and Food Grain Availability in Odisha

41-69

Chapter-IV

Food and Nutrition Security Status of the KBK Region and the Two Districts

70-103

Chapter-V

Food and Nutritional Status of the Household Members in the Study Area

Chapter-VI

Summary and Conclusion

Lists of Tables, Figures, Charts, Maps, and Photos

Lists of Tables

List of Figures

List of Charts

List of Maps

List of Photos

ABBREVIATIONS

AAY	:	Antyodaya Anna Yojana
APL	:	Above Poverty Line
AWWs	:	Anganwadi Workers
BIMARU	:	Bihar, Madhya Pradesh, Rajasthan, and Utter Pradesh
BPY	:	Biju Pakka Yojana
BMI	:	Body Mass Index
BPL	:	Below Poverty Line
CGWB	:	Central Ground Water Board
CSO	:	Central Statistical Organization
CFC	:	Calorie Food Chart
DSC	:	District Statistical Census
DSHB	:	District Statistical Hand Book
DES	:	Dietary Energy Supply
EPG	:	Employment Guarantee Programme
FAO	:	Food and Agricultural Organization
FFW	:	Food for Work Programme
FPS	:	Fair Price Shops
FSOI	:	Food Security Outcome Index
GDP	:	Gross Domestic Product
GHI	:	Global Hunger Index
GOI	:	Government of India
GoO	:	Government of Odisha
GR	:	Green Revolution
HAZ	:	Height-for-Age
HCR	:	Head Count Ratio
HFIAS	:	Household Food Insecurity Access Scale
IAY	:	Indira Awas Yojana
ICDS	:	Integrated Child Development Scheme

ICMR	:	Indian Council of Medical Research
IHD	:	Institute of Human Development
IIPS	:	International Institute of Population Studies
IMR	:	Infant Mortality Rate
IPCC	:	Intergovernmental Panel on Climate Change
ITDP	:	Integrated Tribal Development Program
KBK	:	Kalahandi, Balangir, and Koraput
LBW	:	Low Birth Weight
LPG	:	Liberalization, Privatization, and Globalization
MDGs	:	Millennium Development Goals
MDMS	:	Mid-Day Meals Scheme
MFP	:	Minor Forest Products
MGNREGS	:	Mahatma Gandhi National Rural Employment Guarantee Scheme
MMR	:	Maternal Mortality Rate
MSP	:	Minimum Support Price
MSSRF	:	M. S. Swaminathan Research Foundation
NFBS	:	National Food Balance Sheet
NFHS	:	National Family Health Survey
NFSA	:	National Food Security Act
NGO	:	Non-Government Organization
NHS	:	National Health Survey
NIN	:	National Institute of Nutrition
NNP	:	National Nutrition Policy
NPNSPE	:	National Program for Nutritional Support to Primary Education
NSSO	:	National Sample Survey Organization
OASG	:	Odisha Agricultural Statistics at Glance
OBCs	:	Other Backward Communities
PCR	:	Planning Commission Report
PDS	:	Public Distribution System
PHC	:	Primary Health Centre
PWD	:	Person with Physical Disability

RDA	:	Recommended Dietary Allowance
SAP	:	Structural Adjustment Programme
SCs	:	Scheduled Castes
SDGs	:	Sustainable Development Goals
SDP	:	State Domestic Product
STs	:	Scheduled Tribes
TE	:	Triennium Ending
TEs	:	Targeting Errors
TPDS	:	Targeted Public Distribution System
UNO	:	United Nations Organization
UNDP	:	United Nations Development Program
UNICEF	:	United Nations International Children Emergency Fund
WDR	:	World Development Report
WAZ	:	Weight-for-Age
WFC	:	World Food Council
WFP	:	World Food Program
WFR	:	World Food Report
WHO	:	World Health Organization
WHZ	:	Weight-for-Height
WB	:	World Bank

Chapter-1
Introduction

1.1: Introduction

Despite steady economic growth and development in many parts of the world, a significant proportion of the global population continues to suffer from food insecurity and malnutrition (World Bank, 2009). The United Nation's MDG-1 recognizes that hunger and food insecurity are the core afflictions to the poor people, and specifically sets out to halve the proportion of extremely poor and hungry people across the globe by 2023. Although the situation has improved since the 1990s, the rate of improvement remains far short of that required to attain these targets (FAO, 2016). Nonetheless, over the past 10 years, the proportion of undernourished people in the developing countries fell to 17 percent, because the total population grew faster than the undernourished portion. There is increasing evidence that the number of people who remain vulnerable to food insecurity is considerably higher (FAO, 2019). The FAO (2017) estimated that there are 821 million people undernourished and facing chronic food deprivation in the globe and also calculated that more than one in every ten people is facing under nutrition in the world. The above report also mentioned that about 13 to 18 million people die from hunger due to unequal food distribution every year throughout the world (UN, 2020).

Achievement of national food security has been a major goal of development policy in India for half a century, since the country became Independent. This was to be achieved by attaining self-sufficiency in the availability of food and raising the purchasing power of the poor through the endowment of land and non-land assets and by generating employment opportunities. In the process of ensuring availability of food, an important step is the food distribution through public intervention for stabilizing consumption (Dey and Bisai (2019). In India, the achievements have been substantial in terms of reaching near self-sufficiency in food and overcoming transient food insecurity through public procurement and distribution of food grains (Swaminathan, 2012). Despite the tremendous progress in food grain production the problem of malnutrition still persists in the country. Ensuring food and nutrition security is a big challenge for India, given its huge population and high levels of poverty and malnutrition (Singh and Singh, 2018). The malnutrition among children is prevalent in almost all the states in

India but malnutrition and hunger are very critical problem in Odisha, where the prevalence of underweight children is far worse than the Indian average and higher than any country in the world (Lakra, 2017). The levels of agricultural performance or income have a strong and significant negative relationship with indices of under-nutrition among adults and children. A result, it is suggesting that improvement of agricultural productivity can be a powerful tool to reduce under-nutrition across the vast majority of the population in the state particularly in the KBK Region of the state (Behera, 2018).

India with nearly 195 million undernourished people across the country and it shares a quarter of the global hunger burden (UN, 2020). "The State of Food Security and Nutrition in the World 2018 Report found that there are 195.9 million undernourished people in the country" (World Food Report, 2018). That means, 51.5 percent women (15-49 years of age) are anaemic and more than 14.5 percent of the total population are undernourished in the country. That report also mentioned that one in four children is undernourished, 21 percent children are wasted, and 38.4 percent children are stunted across the country. India is placed at 102 out of 117 countries on global hunger in the world (GHI Report, 2019). The global hunger index mostly depends on three critical indicators like percent of undernourished people of the total population, the incidence of stunting and wasting in children less than five years of age, and child mortality rate below five years old. Although India has done exceptionally well in attaining the Sustainable Development Goals (SDGs) and improving food and nutritional security through the implementation of various policy measures for last decades but however over half of the children and more than 40 percent people are undernourished (IHD, 2019). The recent figure shows that, hidden hunger is growing among the poor and vulnerable sections in the country, even though the quantity of consumption has shot up among those sections (The Hindu, 2020).

World Food Summit (WFS, 1996), defined food security as a situation "when all people at all times have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preferences for an active and healthy life". Quisumbing (1995) mentioned that nutrition in principle is more than food security and he defined nutrition security includes like vitamins, minerals, protein and energy among the family members at all times in the society. However, the broader definition of nutrition security given by FAO (2010), "it states that physical, economic and social access to a balanced diet, clean drinking water, a safe

environment, and healthcare (preventive and curative) for every individual in the society and in addition to that, education and awareness are needed to utilize these services for a healthy and active life."

Attaining food and nutrition security is a matter of great significance for Odisha, where majority (42 percent) people suffer from under nutrition and more than 32 percent people live below the poverty line even after the implementation of various welfare schemes and action plans in the state (Panda, 2017). Nevertheless and most importantly, more than 55 percent Scheduled Castes (SCs) and Scheduled Tribes (STs) are found poor in the state (Economic Survey, 2015-16). Furthermore, the latest report of NFHS-IV mentioned that Odisha ranked second from the bottom after Bihar in severely food insecure states in the country. The Report NFHS-IV also shows that, there are 45.7 percent underweight children in the state. Moreover, the NFHS-IV figure is a significant improvement in under nutrition (about ten percent points increase) over the NFHS-III (Patra, 2018). According to the NFHS-IV Report, still 38.9 percent of children below three years of old are stunted, 18.5 percent are wasted, and 44 percent are underweight in the state. Nevertheless, malnutrition continues to be a widespread problem generally among the poor people and particularly among indigenous people throughout the state and even after there has been substantial progress in the production of foodgrains and advancement in science and technology for the last twenty years (Dalabehera, 2017). Despite all social security measures, malnutrition, hunger, starvation deaths, and poverty among the poor in general and tribal people, in particular, are very much prevalent in the state (Nayak, 2015).

The persistence of under nutrition and the reported incidence of starvation deaths in the different districts of the KBK Region together describe the nature of the current problem of food insecurity within a situation of the adequate overall availability of food grains in the state" Mahamalik, 2013). Moreover, an analysis of (Behera, 2016) the regional patterns of development reveals that benefits of development have not been evenly spread throughout the state and there have been pockets of underdevelopment in the different regions, where the southern part known as KBK Region consists of eight districts (such as Koraput, Malkanagiri, Nawarangpur, Rayagada, Balangir, Sonepur, Kalahandi and Nuapada) are underdeveloped and most backward in compared to other areas of Odisha. In order to develop that region, the government has been implementing plethora of welfare schemes and programmes to reduce the poverty, hunger and

starvation deaths (Parida, 2016). In this region, 59.7 percent people are illiterate and 70 percent people are living below the poverty line (Economic Survey, Govt. of Odisha, 2015-16).

1.2: Major Issues from Literature Review

The significant issues that affect food and nutrition security in the country are due to low purchasing power of the people, high corruption, lack of communication facilities and higher food grain prices that have negatively affected the poor people. Moreover, the severe levels of poverty, lack of quality and nutritious food, lack of awareness among the people, no sanitary facilities, and unhygienic environment, lack of access to clean drinking water facilities, and toilets have influenced both food and nutrition security adversely throughout the country. Thus, the literature review facilitated us to pinpoint the research problems, research gap and also help us to frame our broad objectives of the study. Moreover, the following reviews would allow us to go through different views and perspective concerning the complexion of food and nutrition security in India and Odisha.

Gopalan (1997) discussed food and nutrition security differently, and he mentioned that, inequitable production and distribution of food rather than the inadequate food grain production is the principal factor responsible for malnutrition among the majority people in India. He further said that, schemes like income generation skills among the poor and creation of an infrastructure in the rural areas including tokenism and public programmes could solve the inequality among the people in the country. Further, "he said, ensuring proper nutrition is not just equivalent to avoidance of hunger. Therefore, nutrition security can be accomplished by having adequate fruits, cereals, pulses, vegetables and other essential services whereas the food security can be achieved through the intake of adequate amount of cereals. It is well known that nutrition security is a broader concept than food security. Suryanarayana (2000) examined the trends in changing food consumption pattern in different classes of people in the country and he noted that despite modest growth in per capita incomes, cereal consumption per head has declined; and within the cereal group, consumption has steadily shifted in favour of superior cereals and suggested also type of changes is dictated more by the availability of different types of grains than by choice. Moreover, the author observed that, the overall decline in cereal consumption of the households due to the increase of unit cost of cereals in different parts of the country where coarse cereals are the main staple food.

Taimni (2001) mentioned that, due to inadequate intake of food and other essential services resulting in the worsening condition of physical health and growth leading to undernourishment among the people in the country. In other words, "undernourishment was perceived in the form of protein-energy malnutrition (PEM), iron deficiency (nutrition anaemia), iodine deficiency disorder (IDD), vitamin A deficiency, prevalence of low birth weight (LBW) in children and at-risk mothers and these are regarded in the context of seasonal variation, natural calamities, market distortion and urbanization." Parshuram Samal (2004) examined variations in consumer's consumption pattern in Odisha from 1972 to 2000. He had also studied the consumption pattern of both rural and urban areas of the state including the consumption pattern of the various income groups. The author also calculated and evaluated the elasticity of demand of various income groups including the response of the poor people to changes in food prices in the state. He found that, the proportion of expenditure on food items had decreased from 75 percent in 1972 to 66 percent in 2000 in the rural areas while it had dropped from 65 percent in 19972 to 56 percent in 2000 in the urban areas. He also comes across that, the share of total expenditure on rice had dropped by 16 percent in rural areas whereas it had reduced by 8 percent in urban areas. The author also found that, there was a minimal rise in expenditure on food items like meats, milks, fishes, eggs, pulses and vegetables due to increase in income and change in the dietary pattern of the people in the state.

Hanumantha Rao (2005) studied the changing composition and structure of food-basket of the people in rural and urban region of the country where he found that the foodgrains (mainly cereals) consumption of the people has declined considerably because of multiple factors in the rural region. Moreover, the household expenditure on cereals has been declined due to other factors also such as rise in prices of other food grains like furniture, medicine, cinema, meat, fish, egg, milk modern cosmetics and entertainment apart from other taste and preferences in rural region of the country. Hence, the per capita consumption of foodgrains is determined by both income of the households and prices of foodgrains in the expected direction, and the impact of both variables is very high on the lower-expenditure sections of the rural households. Atibudhi (2006) studied the variations in dietary food pattern and consumption expenditure pattern both in rural and urban areas of Odisha and made a comparison of Odisha with all India level. The author used the NSS household level data for her analysis. She found that, there is a substantial increase of per capita expenditure on non-food items is compared to food items both in rural and

urban areas of Odisha for the last decade. The author also discovered that, the expenditure on cereals had been declined over the period at the same time, the expenditure on non-food items like fish, egg, meat, milk and edible oil has increased to a considerable extent. The fundamental shift in the dietary pattern towards livestock, fisheries etc. is already underway and is likely to intensify further and the structural change necessitates the greater emphasis on diversification towards pulses, oilseeds, milk and vegetables to meet the growing demand for these commodities. Lastly, the author concluded that, the standard of living of the people in the state is very low compared to the country's standard of living.

Krishnaraj (2006) tried to explain about the quality of food consumption and nutritional intake of poor and vulnerable sections of the society and those sections have a strong and close connection with agriculture, as it is the most important source of livelihood for them. He observed that, the consumption of cereals has been declining in the rural region due to fall in farm income and at the same time, the composition of food baskets has been changing quickly both in rural and urban areas of the country. He explained that, due to increase in the cost of agricultural production of food crops and low purchasing capacity are the major problem of food security of the people at the household and individual level in the country. Furthermore, women are the most vulnerable and disadvantageous groups without having proper access to access to the food and having no ownership rights over the land in the context of food and nutrition security in the country. Pradyuman (2006) analyzed the challenges, opportunities, prospects and depth of food security situations in our country. The author underlined the improvement of the standard of living for the better food security status of a large number of small and marginal farmers as our country had done exceptionally well in the agricultural front for the last thirty years. Even though, our country has achieved so much in this field but there are millions of people who suffer from malnutrition including pregnant women and children due to lack of both availability and accessibility of food grains. The country should produce 2.5 million of extra food grains and also more production of livestock, horticultural products and fish for growing populations and solving the food security problems among the poor people.

Utsa Pattnaik (2007) analyzed the detrimental effects of international trade on food security and economic progress of developing countries in the world. The author studied the very negative aspects of international free trade on food exporting nations. Pattnaik also studied about

the negative and universe relationship between two variables like primary exports and foodgrains availability in the agricultural developing countries of the world. Furthermore, the poor developing countries can produce a qualitatively different and quantitatively more extensive vector of outputs and their very richness of land resources have made demand targets of the greed of developed countries." According to Bhowmik (2007), the worst form of deprivation is hunger." He mentioned that, every human being in society has the essential and fundamental right to live and lead a dignified life. The government must provide nutritious food to every individual for his/her healthy life in the country. He also observed and studied about the important and vital factors such as high food grain prices, natural disasters, drought, floods, and inadequate amount of food grains, unemployment, high agricultural input costs, and poor functioning of various welfare schemes, education and lack of primary health care facilities are significantly influencing and affecting the food security of the people in the world. The author highlighted and underlined about the important and key policy actions like providing health facilities, basic education, and clean drinking water, providing nutrient calories, providing food grains to the needy, infirm, elder, and hungry and particularly women and children for achieving food and nutrition security and also eradicating hunger and starvation deaths in the world.

Menon et. al. (2009) studied on Odisha and its development status, and they mentioned that, the state is one of the poorest states of the country "suffer from alarming levels of hunger" for several decades even after implementation of welfare schemes and programmes. They mentioned that factors like low per capita income, lack of proper utilization of resources, high level of poverty, lack of employment opportunities are responsible for hunger and under nutrition in the state. The author found that, some areas are more food secure, whereas some areas are food insecure due to structural and socio-economic factors within Odisha. Furthermore, the regions like coastal and eastern part are more food secure and regionally balanced whereas western and southern parts are food insecure and regionally imbalanced within the state. The study also observed that the region like KBK where majority people suffer from food insecurity, starvation deaths, distress migration, sell of the girl child, lack of proper communication and transport facilities and inadequate food grains. Xaxa (2014) studied the problem of food security among the tribal people and their right to food in India in general and Odisha in particular. Furthermore, "she said that the essence and importance of the right to food are about freedom from hunger." Moreover, the author tried to define hunger, when a person has two square meals

a day in order to fulfill his daily requirements but the wider and far-reaching meaning of food security is under nutrition. She mentioned about some essential and critical rights like basic education, primary health care facilities, and safe drinking water facilities apart from having adequate food availability will help to improve the food and nutrition security of the people in the society. The Supreme Court of the country has given the direction both to the state and central governments in providing and assuring food security to the poor people in general and infirm, girls, pregnant women, old people, a single mother and tribal people in particular in different parts of the country.

1.3: The Need for the Study

Even though India has achieved the macro-level food security, the significant number of people including SCs and STs suffer from food and nutrition insecurity. There are states like Madhya Pradesh, Uttar Pradesh, Bihar, and Odisha having a substantial percent of the malnourished and population below the poverty line (Behera, 2015). According to the NFHS-IV Report, 34.4 percent children (below fives of age) are stunted, and half of the adult women of the state's total women suffer from under nutrition. All these figures depict the state's chronic and pervasive food insecurity among the people due to various socio-economic factors. Even within the state, the development is unequal, where the coastal region is more developed than the southern region. The undivided area of KBK Region (such as Kalahandi, Balangir, and Koraput) that consists of eight most backward and underdeveloped districts in the state such as Koraput, Nuapada, Sonepur, Nawarangpur, Balangir, Kalahandi, Rayagada and Malkanagiri. The KBK Region brought lot of attention due to its underdevelopment, massive migration, unemployment, hunger, severe poverty, food insecurity, malnutrition, and starvation death (Nayak, 2015). It is because of its typical and multidimensional backward characteristics even after development efforts and policy actions initiated and implemented by the state, center and other organizations for the last twenty years in that area (Mahamalik, 2003). However, the grim and deplorable situation of that region remained the same because this region has specific rudimentary and fundamental difficulties in comparison to other parts of the state. The marginalized groups like SCs and STs are the worst victims of food insecurity in that region (Sarif 2009). The frequency of natural disasters like cyclone and drought is again making the people more vulnerable and food insecure. The present study focused particularly on marginalized groups such as SCs and STs and made a comparative study of two districts (one is

developed and other is the most backward district based on the various parameters like poverty, literacy, SCs and STs population, child mortality rate and underweight children) related to the food and nutrition security in that region. Out of eight districts, the study has selected two districts, one is Balangir district with 64.72 percent literacy, 42.5 percent poverty, 38.92 percent SCs and STs population, 157 child mortality rate and 33.7 percent underweight children and the other one is Rayagada district with 49.76 percent literacy, 58.48 percent poverty, 70.4 percent SCs and STs population, child mortality rate is 166 and 42.4 percent underweight children (District Statistical Hand Book, 2016-17 and NFHS- IV). The study mainly focused on food and nutrition security of the household members in Balangir and Rayagada districts of KBK Region in Odisha.

1.4: Research Gap

The important and critical aspects of food and nutrition like food availability, economic access and utilization of the marginalized groups like SCs and STs have not been studied in great detail. There is dearth of research in Balangir and Rayagada districts in KBK Region of Odisha. Most importantly, there is no comparative study of Balangir and Rayagada districts within the KBK Region on the subject matter of food and nutrition security has been done. Thus, the current research has tried to bridge the gap in the existing literature.

1.5: The Broad Objectives of the Study

- The study sought to examine the physical access to food in terms of food availability.
- The study tried to analyze the economic access to food in terms of nutritional security.
- The study sought to evaluate the intra-household food distribution system in the study area using the household level data.

1.6: Data Sources and Methodology of the Study

The current research has used both primary and secondary data sources, the result and outcome of the study mostly depended on the primary data analysis. It is entirely a case study method where each household member is surveyed in the sample villages. The study has used both simple random and purposive sampling method for selecting the three villages in the two districts of the region. The study collected the primary data from the household members through a structured questionnaire and interview schedule method. Furthermore, the present comparative

study has taken Babjore village in Balangir district and Bhitarapadamajhi and Tikarpadar village in Rayagada district as the study area. It comprises of questions regarding the various aspects of socio-economic status, food and nutrition security, sanitation, health care and other issues of the three villages. Apart from the household survey, the researcher interviewed government officials at the block level of the districts for the secondary information. The secondary data are used for analyzing both the first and second objectives of the study. The primary data is used for analyzing the third objective of the study. The important variables that are collected from the field survey are the size of the household, literacy rate, occupational status, landholding, and extent of irrigation, wage rate, income, production, consumption, employment, targeting errors, poverty level, food and nutritional status, drinking water, hygiene, sanitation, livestock, housing conditions, and others. To enrich the present work, the secondary data has been collected from the various sources like World Development Report (WDR), United Nations Development Program (UNDP), World Health Organization (WHO), Census Data, National Sample Survey Organization (NSSO), Planning Commission Report, Odisha Agricultural Statistics at Glance, Central Statistical Organization (CSO), Odisha Agricultural Statistics (OAS), National Family Health Survey (NFHS), National Institute of Nutrition Report (NIN), Economic Survey of India and Odisha, District Census Report, District Statistical Hand Book (DSHB), and from other relevant sources. The secondary data for important variables like landholding status, changing of cropping pattern, Growth trend of food grain production and productivity, poverty both at India and state level, food consumption, per capita availability of food grains at the state level, nutritional status, and other issues are taken into account. The study has particularly focused on the measurement of both food and nutrition security status of both tribal and other social groups in the surveyed area. Before measuring the nutritional security status of the people, importantly, some indicators helps to measure nutrition security such as (i) health which depends on maternal and child mortality rate (ii) education which depends on particularly rural literacy rate of women, (iii) clean drinking water which it depends on percent of families are having those facilities and finally (iv) sanitation facilities which it depends on percentage of households having toilet facilities. Firstly, the study used Calorie Intake Method of (National Institute of Nutrition), i.e. taking the daily calorie intake of the household member for measuring the food security status. For that, the consumption of various food grains from every household member has been collected; the calorie intake per day per person using the Calorie Food Chart (CFC) of NIN for

measurement of food security status has been calculated. Secondly, Body Mass Index (BMI) measures, i.e. the weight in kg per height in meters in squares for children (4-14 years of age) and adults (15-49 years of age) has been used for measuring nutritional status. The Weight Machine and Measurement Tape for measuring weight and height of both children and adults in the three villages of two districts have been used. The above both methods are the quantitative methods and it also considers the different types of measurements like height-for-age, weight-for-age, and weight-for-height. Height-For-Age (HAZ) - Low height-for-age index identifies past under-nutrition or chronic malnutrition. It is an indicator of stunting. Weight-For-Age (WAZ) - Low weight-for-age index identifies the condition of being underweight. This index reflects both chronic and acute under-nutrition. Weight-For-Height (WHZ) - this index is an important indicator of thinness or wasting. Moreover, lastly, wasting is short-term malnutrition due to acute starvation or severe disease, famine, etc., but it may also result from chronic dietary deficiency or disease.

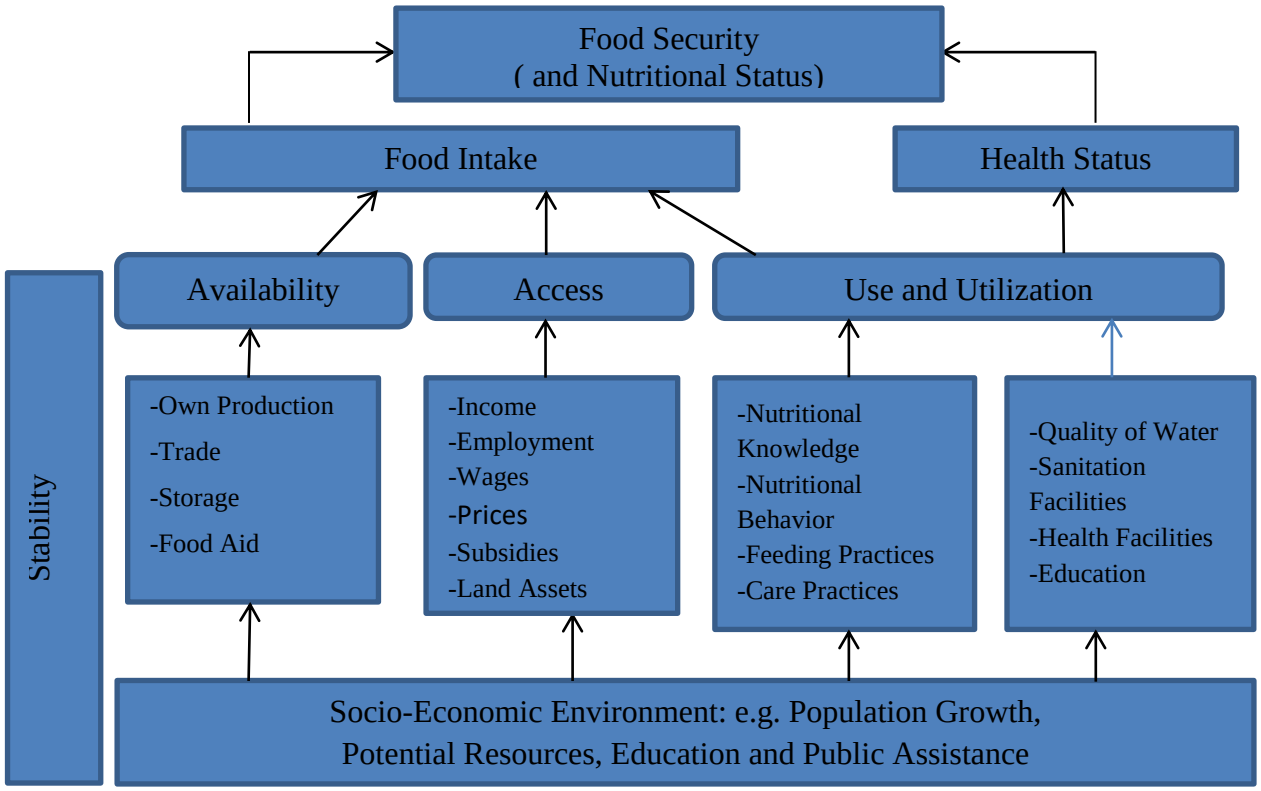
1.7: Theoretical Framework of Food and Nutrition Security

In the food and nutrition security conceptual framework, there are factors like adequate food intake, quality food intake and health status determines the food and nutritional status of an individual in the society. Both food and nutrition security depend on various factors and determined by socio-economic and cultural factors apart from external factors in any society. The three main important aspects of food security like availability, accessibility and utilization that determined the food security of an individual. In other words, availability of food grains will be achieved when sufficient food is ready to have individual's disposal, access to food is guaranteed when an individual has enough means to get proper food for his healthy diet and utilization refers to the ability of an individual to digest the food inside his body. The nutrition security consists of food security and also other important services like health care, clean drinking, hygienic environment, and an adequate biological and social environment. The most important determinants of both food and nutrition security are the food utilization that is closely related to and depend on care practices, food distribution within the households, and individual health status and more importantly, individual's health status affects one's ability to absorb nutrients, and it is known as the nutrient utilization. For example, if an individual suffers from any health problems,

his desire to eat food will be decreased and it will further affect food and nutrition and also the health status of that individual (UN World Food Program, 2007).

There is a close and strong relationship between the health of an individual and his food and nutrition security and it also creates a vicious circle. It explains that, when an individual does not eat sufficient food, and he will have the less capability to resist infections, that will lead to more longer, more chronic and more regular happening of diseases, which in turn and leads to less appetite, poor absorption and further deteriorate the dietary intake of the individual (UNICEF 1998). Moreover, the status of health is determined by the access to health services and the quality of health services depends upon the important factors like good houses, waste disposal, clean drinking water, hygiene, and clean environment. A bad and poor health environment can leads to a lot of diseases among the people. So a right healthy environment is very crucial for better food and nutrition security of an individual and along with awareness and education is must necessary. Broadly, the household's social and economic condition plays an important and crucial role for better access to both food and health security that will make an individual happy and healthy in society. Proper nutrition is an indispensable component of a healthy life. The study used the FAO Framework of Food and Nutrition Security to explain the linkage among the various inter-dependable variables and their interaction with each other.

Chart-1.1: Conceptual Framework of Food and Nutrition Security



Source: FAO, 2002

1.8. The Limitations of the Study

The current research is surveyed in Balangir and Rayagada districts out of the eight districts in the KBK Region of Odisha. The results and findings of the study are representative of the regional population. The research is focused mostly on SC and ST population in Balangir and Rayagada districts of KBK Region. The findings of the study may or may not resemble in other parts of the state or the country. Moreover, one of the limitations is that people were reluctant to give some information about the income status and weight status in the sample villages as rural tribal people were not aware of such studies. The present study is conducted only in the three sample villages of two selected districts of the state. Though the most significant percentage of malnourished people is found among the tribal population and geographically concentrated in rural areas of the state. Hence, it does not represent a complete picture of the state and the country as long as socio-economic and geographical factors are concerned. The study entirely depends on the evidence provided by the household members in the sample villages, and therefore it cannot be generalized as a whole.

1.9: Chapters Scheme

The very first chapter discusses the introduction of the study. It mainly focuses on introduction, the problem of the study, research gap, objectives, data sources and methodology, limitations and chapter schemes. The second chapter focuses on the review of literature; it tells about the various scholars and researchers who have studied on various aspects of food and nutrition and its impact on hunger, malnutrition, starvation deaths, and link with climate change and many other issues. The changing structure of agriculture in Odisha has been described in the third chapter. The fourth chapter analyzes the poverty and food security status in the state, the KBK Regions and the two districts. The fifth chapter highlights the socio-economic status along with the food and nutritional status of the people in the study area of the two districts. It is purely based on the primary survey and case study of three villages of Balangir and Rayagada districts of KBK Region in the state. The sixth chapter discusses the summary, conclusion and policy suggestions for the above-stated problem in the Balangir and Rayagada districts of KBK Region.

Chapter-II
Literature Review

2.1: Introduction

The millions of people died from hunger and starvation during the time of great 1943 Bengal Famine in India. There was a severe shortage of food grains and other essential items during that time all over the country. The great famine of the early 1940s led to the origin of the food grain distribution (like later named as Public Distribution System) in the country in order to provide food grains, particularly in the urban areas. The country had come out from the severe food shortages and substantial dependency on foreign countries to a very reliable after the late 1960s. However, the success of the Green Revolution (GR) particularly helped the country to achieve the required amount of sufficient food grains for the growing population. In other words, the history of our agricultural sectors beckons on the success of the Green Revolution along with White Revolution in our country. And the Second Green Revolution could be launched in the coming future in order to step up and double up our agricultural production for the growing population in the country. Moreover, after the Economic Reforms of the 1990s, the agricultural system has undergone a structural change particularly towards the high-value goods due to change in income level of the people, expanding economy, modernization and change in dietary pattern. The pattern of agricultural production had changed dramatically and significantly towards high valued commodities like egg, fish, dairy products, fruits, meats and vegetables and most importantly changes in the consumption of cereals among the people in the country due to the above mentioned factors.

The selected area of research for the doctoral study is "Food and Nutrition security in Odisha: A Case Study of Three Village of KBK Region." The study gathered a lot of knowledge and information from various reports and books, very similar to the area of research, as they are very rich and vast in explanations and researcher has attempted to summarize the various reviews in a very broad manner for finding and building up the study's problems, research questions, main objective and methodology. Based on the various aspects of the different authors explanations, the reviews have been categorized into four broad and essential sections, like, (I) literature that addressed the measurement and definition of food and nutrition security point of view, (II) Literatures that tried to address agriculture and food and nutrition security point of

view, (III) Literatures that explained about the state support policies and food and nutrition security and the (IV) the last section discussed about the tribal, health, and development.

2.2: Definition of Food and Nutrition Security

World Food Council (1988) defined food security as a two-fold problem, viz. firstly that food is said to be available, accessible, and affordable when and where required in adequate quantity and quality and secondly, that an assurance that this state of affairs could reasonably be expected to continue or in other words that it could be sustained.

Maxwell and Frankenberger (1992) defined food security as secure access at all times to sufficient food and the four fundamental concepts in the definition are (i) sufficiency, (ii) temporal consideration, (iii) access and, (iv) security.

Haddad et al. (1994) "mentioned that, food security as the availability of sufficient food at all times for all people to ensure an active and healthy life. Adequate food referred to both the quantity and quality needed for good health."

FAO, (1996) defined food security exists when all people at all times have physical social and economic access to sufficient, safe and nutritious food to meet their dietary and food preferences for an active and healthy life.

Swaminathan (1996) hypothesized the food security in universal viewpoint as livelihood security for all the household members that guaranteed both physical and economic access to a balanced diet, safe drinking water, and environmental sanitation privacy, educational and primary health care.

The Government of India (1997) underlined the role and significance of the food security at different levels and where household food security implied a situation where everyone has both physical and economic access at all times to the food needed for an active and healthy life. Essential elements of food security are (i) adequate availability of food, (ii) efficient distribution, and (iii) the accessibility of adequate buying capacity in the hands of the people.

Pant (1997) defined food security as the availability of a sufficient quantity of food, and adequate resources to purchase it, both at the national as well as at the household level.

The World Food Program (1998) defined food security would be considered to exist where all people at all times have adequate food needed for an active and healthy life. It considered not only the food supply problem but also the concern of distribution and access as well as exposure to risks that would threaten household food security.

Frankenberger and McCaston (1999) explained "household food security in terms of livelihood security as sufficient and sustainable access to income and means to meet basic needs which would include sufficient access to food, potable water, educational opportunities, social integration, community participation, health facilities, and housing."

FAO (1996) defined food security comprised of five things such as : (i) food security is a matter of physical access to food as it is of economic access or entitlement to food; (ii) food supply is related to all people irrespective of their income level, age, education, gender; (iii) food should be made available to them at all times; (iv) food has to be available in sufficient quantities preferably in time with the consumption preference of the people, and (v) food has to be safe and nutritious to lead an active and healthy life.

Quisumbing (1995) mentioned "nutrition is embedded in FAO's definition of food security: that all people, at all times, have enough, safe and nutritious food for an active and healthy life. Moreover, the nutrition focus adds the aspects of caring practices and health services and also healthy environments to this definition and concept. It targets at what is more precisely called 'Nutrition Security', which can be defined as adequate nutritional status in terms of protein, energy, vitamins, and minerals for all household members at all times."

2.2.1: Measurement of Food Security and its Indicators

There are authors like Frongilo, Chowdhury, Ekstron, & Naved (2003) developed a household food security scale for calculating and monitoring the food insecurity among the poor-income nations and particularly in Bangladesh. There are some quantitative and qualitative indicators of both food and nutrition security that are suitable for mapping and assessing the Millenium Development Goal-I (MDG-1). For instance, the study found that women in Bangladesh are facing severe poverty and vulnerable to food insecurity due to low income earning. Coates, Webb, & Hiuser, 2003; Coates et al., 2007, studied the various important factors that affect household's and individual's dietary pattern and food access. They also highlighted the effective

policy actions and strategies that are helpful to improve food security among the poor households those are run by the women folks.

Roggers (2006) highlighted the usefulness of daily food routine for helping the coping mechanism, and he also spoke about the New Multidimensional Poverty Index that is very effective for measuring both poverty and food insecurity accurately. “Alkire & Santos, (2010) described the Multidimensional Poverty Index is an advance than the one-dimensional poverty measures because it points to the critical deprivations for describing and reducing poverty, a summary index cannot meaningfully inform the expression of poverty and diseases that are experienced by members of, particularly disadvantaged groups.” Some authors cast some doubt about the universal model for measuring food security at household level of ultra-poor people but there are need and importance for the local understanding of poverty in order to measure the household food insecurity accurately in any society (McGregor, 2004).

2.2.2: Food and Nutrition Security

Foster (1992) studied the food security in terms of the food supply in comparison to food requirement at the local, regional, national and global level. Additionally, the broader meaning of food security goes beyond the food supply rather, it should include access to food that is determined by means of entitlements, sustainability and susceptibility. Food security is thus concern with both the production and distribution of food. To achieve sustainable food security, first of all, there must be enough current and future food production to meet the world population’s need for all adequate nutrition. Given that there is the adequate global production, the different countries of the world should able to acquire their required supply either from their share in the world production or through trade in the world market. Acharya (1983) defined “food security means not only the availability of food for direct consumption but has other implications as well and the availability of food grains will have little relevance if people do not have the purchasing power to buy them for their consumption.” Montoreall and Ho (1984) mentioned that, biological absorption is also influenced by the non-food factors and those non-food factors are also knows as the food factors. Swaminathan (1996) highlighted the different policy actions for attaining both food and nutrition security in the country. He also underlined the importance of sustainable development in agriculture for the future growth of agricultural production and food security of the millions of people in the country. He also spoke about social

safety measures and providing entitlement to food for enhancing the income of the rural household across the country. According to him, other important and essential services like basic education, clean drinking water facilities, primary health benefits, adequate food supply, balanced diet, and environmental sanitation, are very much required for achieving food security in the rural areas.

Vyas (2000)" highlighted the importance and significant role of different players like state, organizations, markets and civil society for guaranteeing food and nutrition security of the common people in the society. Dev (2004) said that nutrition is a fundamental part of the health and well-being of the individual. Under-nutrition leads to low energy, low work output, low productivity and naturally contributes to poverty which ultimately leads to impaired growth and development of the country. It is therefore thought essential to provide an adequate amount of food to the poor people in the society; as a result, it will increase the nutritional security of that section. According to De Haen et al. (2011), there are currently three conventional approaches to assess chronic food insecurity. The first one is the FAO indicators of undernourishment, which calculates the food availability in terms of quantity for human consumption and estimated using the National Food Balance Sheet (NBS), taking into account production, trade, stock changes, non-food uses, and other household use. The second measure of food insecurity uses household food consumption survey with data on household expenditure on various food articles. Furthermore, finally, anthropometric measures for children such as weight-for-height and height-for-age provide yet another measure of food security. De Haen et al. (2011) argued that comprehensive assessment of food security should be able to identify the number of food-insecure individuals, the reason for their food insecurity and the influence of schemes and strategies to solve the problems of food insecurity. FAO/AGN (2011) stated that "food and nutrition security exists when all people at all times have physical, social and economic access to food of sufficient quantity and quality in terms of variety, diversity, nutrient content and safety to meet their dietary needs and food preferences for an active and healthy life, coupled with a sanitary environment, adequate health, education, and care."

2.2.3: Coping Strategy and Food Security

Maxwell (1996) described the coping strategy, and Coping Strategy Index is used as a substitute to a 24-hour consumption recall for measuring food insecurity among the household members. The above index is a simple and rapid parameter for judging the household food security behaviour that pops a simple question to household members "what do you do when you do not have enough food and do not have enough money to buy food?." It is all about how a household manages or cope or run his/her household when there are shortages of food in comparison to requirements. The Coping Strategy Index score displays "whether household food security status is declining or improving" and the greater the score, the higher will be the coping power, and therefore the food insecurity will be higher among the households. Devereux (1993) explained when food security of a household worsen during the time of food shortage, the household members use an extreme coping mechanism like sale of valuable assets for purchasing food for household members but it will have future long term consequences of the households.

Webb et al., (2006) described the proxy indicators like calorie intake, food storage, and nutritional status of children below five years of age, productive assets, and level of income are the measures of food access, but it was supposed to have negative consequences on the food security of the households. Webb et al., 2006; Coates at al., (2006a, b) explained about the "Household Food Insecurity Access Scale (HFIAS) which identifies three key domains household access to food: (i) perceptions of insufficient quantity of food; (ii) perceptions of inadequate quality of food; and (iii) anxiety or uncertainty about to meet basic requirements". Christiaesen and Boisvert, (2000), explained that the coping mechanism, where household members can predict and forecast the food access problems before it ascends and people starts to change their behaviour long before the real crisis affects them. The classic example is urban and downtown of African countries. Davies (1993) underlined that, it is very essential for making a distinction between long-tern coping mechanism and short tern coping mechanism, as it is one among the crucial food security indicators.

2.2.4: Consumption and Food Security

Radhakrishna and Ravi, 1992, Rao, (2000) studied the consumption of cereals among the households in the country and using the NSSO reports for explaining all those trends where they found, cereal consumption of the people both in rural and urban areas has been falling after the 1970s. They also observed that, the per capita cereal consumption had dropped to 0.72 percent in the rural region and 0.74 percent in the urban region per year between 1970-71 and 1997-98 of the country. They also studied the important reasons behind the changing pattern in cereal consumptions of the household, particularly in Haryana and Punjab. Meenakshi (2001) examined the consumption pattern of food and cereals of the household members in the country and mainly focused on the superior and inferiors food items. She also observed that the share of total expenditure on food items among the rich and poor sections have declined due to various factors like increase in income, change in dietary pattern and taste and preferences. People are consuming more rich foods like vegetables, fish, meat, egg and milk due to the above mentioned factors. Suryanarayana (2000) also examined the changing pattern of food consumption of various sections of people in the country. He noted that, consumption of the people both in rural and urban areas has steadily shifted towards superior foods and at the same time, consumption of cereals has dropped due to rise in per capita income in the country. Rao (2000) observed that due to expansion in rural infrastructure and rural communication has made both food and non-food cheaper for the people in the rural areas of the country. This has made the reduction of cereals and increase of non-food items. He further said that, there would be no reduction of human welfare due to less consumption of food intake.

NSS 68th Round Data mentioned the continuous rise of per capita income of the people has led to the increase of demand for various food grains of the households in the country. The relative prices of food grains have been declining in comparison to prices of non-food grains in the last twenty years, and that has caused the increase of demand for foodgrains. However, in reality, there is a decline in real per capita demand for food grains in the country. Bhakar (2005) studied, how the nutritional status of the rural populations are affected due to change in socio-economic factors in the country. Atibudhi (2006) studied the changes in food consumption and shifts in a dietary pattern both in rural and urban areas of Odisha. And she further compared the Odisha's monthly per capita expenditure with all India level. She used the NSS household-level

data for explaining all those trends in the state. She further mentioned that, there is a sharp rise in per capita expenditure on non-food items compared to food items both in rural and urban regions of Odisha for the last two decades. Samal (2004) also studied about changes in rural and urban region's food consumption pattern from 1973 to 2000 in Odisha. He mainly focused on the different income groups for studying all those trends in the state. He also calculated and studied the demand elasticity of various income groups in the state. He examined and found that, the reaction of the rural poor families to rise in food prices. He also highlighted the decrease in monthly expenditure on food items both in rural and urban areas of the state in the same period.

2.3: Agriculture and Food Security

Rao (1995) mentioned that, India has achieved self-sufficiency in food grain production and eliminated the transient food insecurity to a large extent due to success of Green Revolution; India has achieved self-sufficiency in food grain production and eliminated the transient food insecurity to a large extent in the country. With surplus food grain production, there was no further need to depend on the volatile external markets, and he said that the achievement on the production front did not result in matching success in ensuring food and nutrition security at household level in the country. Parthasarathy (1996) analyzed the introduction of sophisticated technology in the agricultural sector could displace people engaged in the traditional sector. Moreover, he discussed three significant forms of social security to the people involved in unorganized sectors like agriculture sector, Viz, food security, employment security, and health security. Patnaik (1996) discussed the trends in agricultural production and shifts in cropping pattern with the introduction of the Structural Adjustment Programme (SAP). She argued that the land under food crops gives away to cash crops resulting in scarcity of food supply in the country. Sen (1993), Swaminathan (1996), (2002), Patnaik (2007) argued that an increase in food production does not ensure food availability for all and buying capability of the people is necessary to ensure food security in the country. "Navadkar and Yadav (2007)" said that India has become more self-reliant both in food grain production and food requirement after the great Green Revolution. They further highlighted the broader and objective oriented goals in increasing agricultural production for better access to food grains of the rural people through participatory approach in the country.

2.3.1: Climate Change and Food Security

WFP (2006) studied the harmful impact of climate change and its long-term effects on food and livelihood security of the people. It also increases the occurrence and intensity of disasters like migration, reduction of production and productivity, storms, landslides, droughts, and floods in the world. The impact and effects of climate are so huge and powerful that, it will destroy community assets, food crops, and social-economic infrastructure and it will also deteriorate the livelihoods of the million households and increase poverty among people across the globe. And most importantly, it will increase the sea level rise in the coastal region of the world. Therefore, coastal communities will be more affected due to loss of livelihoods. Lobell et al. (2008) argued that, livelihood security, world farming sectors and food security are so vulnerable to climate change. Therefore, the respective governments should give significance to climate change adaptation needs for saving future food security in the world. There should be more suitable economic policy intervention and climate resistance oriented action that could help to boost agricultural production and saving food security systems of the people in the world. Lal et al. (2011) mentioned how Asian countries are severely affected by the harshness and uncertainties of climate change due to its huge population. They said that, both food security and productivity are hugely affected by the sea-level rise in Bangladesh.

Mitra (2009) studied **t**he expected climate change influences and widely affected India's economy and the food security of the people across the country. The author also highlighted the impact of global warming on millions of small, marginal and poor farmers and others who make agriculture for their life and livelihood due to severe climate change in the world. However, the weather system also got affected potentially by global warming across the globe. Economic Outlook (2010-11) mentioned that, the world will face huge food shortages potentially due to rapidly changing climate and rising population growth in the next decade. Moreover, India will also suffer from climate change and the frequent erratic monsoon that will reduce food grain production and impact livelihoods of million farmers. Because, nearly 70 percent of the population live in rural areas and 52 percent people are engaged in the agricultural sector in the country. Walthall et al. (2012) mentioned that the erratic weather condition and monsoon due to climate change have hampered and will continue to hamper the pattern of agricultural systems, natural ecosystem, flora and fauna, and human society across the world. There are some study shows that, there is both direct and indirect impact of climate change on agricultural food grain

production, productivity, farmer's income and importantly food security of the millions of households in the coming years in the globe. IPCC (2013) studied the connections among weather, climate, and food production and food security and their interlinked relationship in a very broader perspective. The report also mentioned that, human activities like deforestation, expansion of markets and fossil-fuel combustion are continuously increasing day by day over the last few decades in the world.

2.3.2: WTO and Food Security

Walter and Sedan (1994) opined that the monetary and fiscal compression is the critical component of an orthodox program of structural adjustment and stabilization to any country. The experience of the last twenty years indicates that when government expenditures are reduced, the cut falls invariably and it most sharply reduced development expenditure on social sectors. In the persuasion of the IMF and World Bank for reducing fiscal deficit, a large number of developing nations including India cuts expenditure in welfare programmes and it have had an adverse effect on consumption, food and nutrition security of the poor people and have seriously undermined the impact of providing food security in developing countries of the world. Bandhopadhyaya (1995) mentioned that the essential ingredient of SAP was to reduce the government expenditure on social welfare schemes in order to lessen the fiscal deficit along with the devaluation of domestic currency and giving more power to the market in the system. Moreover, the immediate and inevitable consequences of the reduction of government expenditure are the cuts in public investment in agriculture. There was a huge change in the production pattern such as from food crops to non-food crops due to liberalization, and it has severe consequences for domestic availability of food grains thereby reducing the food security of the people across the country.

Swaminathan (1993, 1996, and 2000), Mooij (1994), Dev (1998, 2001), Singh, (2002), Ghosh and Chandrasekhar (2002), Ghosh (2006), Patnaik (2007) covered and expressed their views on impact of SAP on both farmer security and the poor people's food security status in India. These authors felt that the policy would harm the food security of the people, and they conducted many studies to show how food security has deteriorated after the adoption of these policies. Singh (2002) stressed the need for the government to follow their policies and not to dictate to others. He suggested that state, civil society, and markets are to be equally balanced to accomplish both food and nutrition security and the balance should not be tilted towards any of

it, and that should complement each other. The government should address its policies for agricultural growth, keeping in view food security, poverty and nutrition security and their population in the country. Patnaik (2007) correlated the decline in food security to agriculture. The SAP has affected agriculture and production to a great extent. The shift in cropping pattern is also being witnessed to a large and significant scale. The decline in production has led to the loss of availability of food grain throughout the country.

2.3.3: Hunger, Famine and Food Security

Brown and Eckholms (1975), Sen (1982), Dreze and Sen (1990) opined that the issue of famine and hunger is closely linked to the problem of food scarcity. Sen argued that food production and food availability is not a satisfactory condition to stave off hunger and famine. He demonstrated it through his study and shows that famines broke out due to uneven foodgrains distribution even in areas with enough food grain production in the world. Sen and Dreze, in their book, *Hunger and Public Action,* argued that there is a decisive role for public action to combat starvation and nutritional deprivation among the people. To them, the essential elements to be promoted through a public action for eliminating endemic deprivation and under-nutrition include food, necessary healthcare facilities, primary education, clean drinking water, living space, basic sanitation in the country. They believed that first; the orientation of public action must depend on the feasibilities of a different course of action. Second, the public is an independent entity and is divided based on class, ownership and occupation, gender, ethnicity, creed, colour, community, and culture. At the same time, state action for the elimination of malnutrition has been emphasized in the following forms, food grain production, distribution, income, and employment creation in regular way, providing health care facilities, augmenting economic development and growth of income through the expansion of productive activities.

Hadke and Jichkar (2006) defined "the concept of food security from various studies and examined the different methods advocated in improving food security in developing countries." The authors mentioned that, poverty and food consumption are positively and directly related. They also observed that, low-income households suffer more from poverty and hunger in comparison to the households having more financial resources. Moreover, millions of poor households suffer from the inadequately balanced diet due to various factors in India but most importantly low purchasing power of the people. The authors also gave some policy actions and

important policy options for increasing the food and nutritional status of the poor people throughout the country.

2.3.4: Poverty and Food Security

Foster (1992) mentioned about the problems and failures in the various welfare schemes and policy actions for reducing poverty in India. Moreover, "food security generally refers to the overall regional, national or even global food supply and shortages in supply compared to requirements, but with increased observation of disparities in the sufficiency of food intake by certain groups, despite overall adequacy of supply, the term has been applied more recently mostly at a local, household or individual level." Suryanarayana (1997) defined food security comprises both physical and economic accessibility of food for the entire population. He said that, PDS would take care of physical accessibility and poverty alleviation programs will take care of economic accessibility, it is a holistic measure to reduce poverty in India. He further mentioned that food security contains both physical and economic accessibility of food for the entire population in the country.

Deaton and Dreze (2009) explained that, when the income of the people increases, it is supposed to improve the nutritional outcome, but it is not always true. They observed that, nutritional intake of the people has worsened even after the increase in income and expenditure on various food and non-food grains and also the elasticity of total expenditure to nutritional intakes like protein and calories remain very high in the country. That shows that, there is a big puzzle between rising consumption expenditure and falling nutritional outcome in India. There are numerous clarifications in this puzzle like falling nutritional outcome along with decreasing poverty among the people and at the same time increasing income and expenditure of the household both in rural and urban areas of the country. In other words, it is very difficult for researchers and policymakers to find a way out to solve this puzzle. Both these authors concluded that, the falling calorie intake of the people with rising income may be because of an improvement in living conditions. They also mentioned that, the poverty and food insecurity relationship occurs because of two reasons, firstly, the poor households spend a lot of money on food items and secondly, because of poverty-nutrition trap.

2.4: State Support Policies, Food, and Nutrition Security

Sen (1981) argued that, access to land, entitlements and special endowments these are the conventional solutions prescribes for food insecurity based on perception about the ability to acquire, and the availability of food grains. Among these instruments, the importance of PDS as a safety net during this adjustment program will be valued and practically, the total food grains availability does not adequate for the poor people. Bapna (1990) discussed that as to guarantying the poor people's food security requires the inclusion of deserving poor people in the systems and excluding the non-poor people out of the system in different parts of the country. Further, the PDS can ensure physical access to food at reasonable prices; it can augment economic access only to the extent there is some implicit income transfer by its efficient operation. Venugopal (1992) mentioned, having enough buying capacity will never provide food security to the poorest of poor people unless there is an effective delivery system throughout the country. He said, "improving food security at the household level is an issue of great importance for a developing country like India where millions of poor suffer from hunger and malnutrition, as condition obtain country today chances are that others would be at the risk of suffering in future too." With this background, he suggested that for framing policies on poverty and food security, a thorough knowledge about the ways of living of the poor is essential. He is the view that food security can be improved by a mix of other policies like wage employment schemes, self-employment schemes, TPDS, nutrition-based programs and provision of health facilities would be more meaningful.

Dev and Suryanarayana, (1991) and Parikh, (1994) mentioned about the role and importance of the discriminatory approach in providing PDS benefits to the poorest of the poor people (like most vulnerable people) in the country because of reduction of government expenditure on social welfare schemes under the Liberation, Privatization, Globalization programme (LPG). They highlighted that, the malnutrition among the poor people is not because of only inadequate food availability but also due to unequal food distribution and inappropriate consumption calories. Swaminathan (2002) said the objective of PDS is to reduce food insecurity so it should be available to those who are undernourished and those who face the threat of undernourishment in the country. More importantly, chronic hunger persists on a large scale in India and the persistence since hunger, malnutrition, and vulnerability on a large scale is an in justification of PDS. Suryanarayana (2010) explained the various factors like low income;

inadequate food availability and lack of physical access are the main reasons responsible for low access to PDS by the poor people in the country.

2.4.1: PDS and Food Security

Ravallion (2003) emphasized that, the income gain from subsidized PDS is estimated by a reduction in poverty and subsidized food transfer to each cardholders in the country. Moreover, "apart from this, the recent advances in impact assessment methodologies allow for assessing the net gain by considering the counterfactuals of recipients of a program in the country." And it is calculated by evaluating the actual and net effects of any welfare programme through propensity score matching by comparing with the target population in the country. Tritah (2003) mentioned that the benefit of the propensity score matching technique is based on the net gain from any welfare scheme (particularly PDS programme) in the country. He also estimated the reduction of poverty, income-expenditure gain, and increase of food intake and improvements of nutritional outcome through transfer methods due to participation in the PDS programme in India. Further, he also found the robustness of PDS effects by using these methods through the contribution of PDS to increase in the nutritional outcome as well as the improvement in food expenditure of the poorer section of the society. Mehrotra and Mander (2009) found about that, "the empirical results for rural India showed that the factors that affect poverty are not found to necessarily influence the calorie gap, although poverty and food security are somewhat related and affect each other." They found from the empirical evidence that, there are various important welfare schemes, for example, PDS and food for work programme (FWP) have very less achievement in solving the food security problems due to various reasons in different parts of the country. The above low falls, broad issues and problems of the various welfare programmes gives a warning and wake up call to the policymakers and policy experts for redesigning the strategies for better effective policy implementation towards the larger benefits of the targeted sections in the country.

2.4.2: ICDS and Food and Nutrition Security

The government of India's one of the most important welfare programmes is the ICDS that provides the health benefits to the small children in the Anganwadi Centres across the country and also it addresses the malnutrition problems among the women and small children in the society. It has the huge and pronounced potential to bring a change in the food, health and

nutritional status of the small children and women those are entitled to get that scheme throughout the scheme. Srivastava (1985) observed that, the above scheme had not made any substantial difference or change in the improvement in dropout ratio among the children in the country. He mentioned that, this scheme has a positive impact on the children's growth and cognitive development. He also found that, the ICDS children are better students compared to non-ICDS students for solving the given tasks. "The National Policy on Education (1986)" was given great importance to early child care for boosting the growth and development of children's mental ability and solving technique in the country. The above programme is major plank of the government of India in order to support the child's education as they the future of our nation.

Pandey (2004) studied about the number of participants and trainers (like CDPO and ACDPO) ICDS functionaries in the country, and they are the people who contribute the better function of this scheme for larger benefits to the small children. He found that, the important factors like lack of motivation among the supervisors, corruption among those employees, wish to become the third-grade employee and not showing any career progress are the main reasons for affecting the better functioning and also improvement of the ICDS programme across the countries. Moreover, the success of the scheme depends upon the participation of the community people. The programme can be highly successful and most reach out to the larger children when, there will be more participation and involvement of the community leaders and more dedication of the employee who are directly involved in the running of the programme in the country. The author observed that only 40 percent AWCs are aware of the right knowledge and perception for encouraging complimentary food practices across the country. Therefore, it creates a big and significant gap between the above two parameters and it is a most important reason for slow progress in the reducing the under nutrition among the children below five years of age in the country. Thakare's (2011) study showed, the level of education among the children have jumped up due to better services of the ICDS programme across the country.

2.4.3: MDS and Food and Nutrition Security

Kannan (1995) explained the Supplementary Nutrition Program in Kerala; it consists of a program for pregnant women and pre-school children, school meal schemes for primary school children. He said that the above programme has increased the attendance ratio among the girls and has decreased the dropout ratio among the children in the state. Suryanarayana (1999) mentioned that the Food Supplementation Schemes, like the school feeding scheme in Jamaica, had worked wonderfully in reducing the dropout ratio among the girls and boys to a greater extent. GNCTD (2000) described the MDMS implemented in Delhi in the late 'nineties was found to be lacking in many evaluation parameters and has not created a positive impact on the school children. Kannan (2001) mentioned that these programs have the advantage of food distribution; permit enough scope for targeting individual households involve relatively small quantities of food. Other programs include on-site feeding scheme and nutrition rehabilitation centre. Promises to expand subsistence food production and in Kerala under the applied nutrition program whereby women are trained to develop kitchen and prepare nutritional food using available local resources. Dreze and Kingdon (2001) studies talked about the poor educational progress of the children due to poverty and low standard of living among the households and also mentioned that, the children's educational achievements depends on the socio-economic status of the particular households in the country. They had conducted a study in 2001 in the rural areas of North India and found the role of parental education in the progress of children education and concluded that there is a strong relationship between the level of parental education and children's achievements in education.

Jacoby (2002) studied the dietary intake of the school children and its impact on nutritional status in the country. He used the random sampling method to carry out his study and discovered the exogenous effects of MDM meal on calorie intake and nutritional status of the school children across the country. The author examined the vulnerable and the poorest of the poor households where he found that, the above scheme has benefited to a large number of school children from weaker sections through reallocating the resources in the country. Planning Commission (2010) showed the MDM scheme to be lacking in several evaluation parameters. The report found that, there is a huge increase in enrollment and participation rates among the school children in Tamil Nadu due to awareness and spread of primary education. The state set a great record in comparison to other states in the success of this scheme. There are lots of studies

and researches have been done on MDM programme and student's success throughout the country, and most of the studies showed a direct and positive relationship exists between the MDM programme and enrollment and participation of the school children across India.

2.4.4: Employment Schemes and Food and Nutrition Security

George (1999) analyzed and gave very much importance to employment schemes and income policies in increasing economic access to food for achieving food security in the country. He also emphasized the development of agriculture as a critical strategy for eradicating poverty and improving food security among the poor people across the country. Deshingkar and Johnson (2003) studied the wages both in poor villages and prosperous villages of the country. They observed that wages are too low in poor villages in comparison to rich villages. In other words, people in rich villages used migrant labour and machinery for better production and have a better standard of living whereas people in the poor villages are going out for employment opportunities in outside of their villages in different parts of the country. Both the authors blamed the government for replacing the labour employment by machinery and created the huge number of unemployment in the country. Dreze et al. (2006) studied the two important welfare employment schemes like food-for-work programme and Rozgar Yojana in the two hundred most backward districts of the country. Their main and important argument was that employment schemes would reduce distress migration and decrease the flow of people in rural areas to the towns and cities in search of employment opportunities in India. Sharma et al. (2009b) underlined the problems of employment scheme like Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) such as lack of sufficient work, late payment, corruption; labour is replaced by machinery, less number of days and lack of proper institutional facilities are creating the negative impact on the rural people across the country. Other reviews showed that, the employment schemes have raised the food and nutritional status among the rural people by the increase in food intake and calorie intake due to rise in income of the people particularly in Rajasthan, Chhattisgarh, Andhra Pradesh and Maharashtra in the country.

2.4.5: Intra-household Food Distribution and Food and Nutrition Security

Pinstrup-Andersen (2009) found that the critical and important factor such as uneven food distribution within the family is one of the most significant reasons for food insecurity among the people in a particular typical household in India. Accordingly, the intra-household food insecurity arises due to unequal and relative food calorie distribution among the members of a family, and that will lead to malnutrition in the country. Hadleya et al. (2008) studied the serious concern regarding the access to food problem and food allocation within the households particularly in the developing countries of the world. They underlined that, attaining food and nutritional security at the household level have raised thoughtful insights in policy analysis. It has brought issues to the policy analyst, policymakers, among the government servants, experts, and researchers regarding the issue of intra-household food distribution that lead to food insecurity among the members within the households. They found that uneven distributions of food within the household members are an important cause for inadequate intake and under nutrition in the developing countries of the world.

Central Bank of Srilanka (1998) found that malnutrition is prominent among women and children in the country. The report also found that, a large number of women do not get sufficient amount of required calorie, protein and vitamins for their daily requirement in order to lead a healthy life in the society. It also mentioned that, goitre, under nutrition, low energy, and low food intake is high among the women in different parts of the country. There are various reviews and studies are done in various countries of the world and showing the same results and outcomes. However, children, girls child, women get very less food compared to the male counterparts causing the under nutrition among the people within the households. Moreover, a sufficient amount of food grains will never guarantee food and nutrition security within households in society. The food and nutrition security could be achieved within the households, particularly developing countries by right understanding the various dimension of unequal food allocation or distribution. Akinyele (2010) studied the intra-household food distribution among households in Nigeria. The author also observed and mentioned how unequal food allocation affects food and nutrition security among the people in a typical household in that country. Furthermore, he also found that the family members suffer from under nutrition due to various factors apart from unequal distribution.

2.5. Tribal, Health, and Food Security

Health plays an important and significant role in human development and progress, and it is an indispensable part of the human well-being in society. However, there are various important factors like the social, political and economic one that affect and determine the health status and well-being of any community in the society. In other words, the health-seeking behaviour of any community is determined by the disease, customs, shared beliefs, and practices, apart from social and economic factors in the country. ICMR (2003) found that, the health status of the tribal people is very low and poor due to various reasons like geographically isolation, deforestation due to industrialization, lack of communication facilities, remoteness, and lack of development in their region in the country. Furthermore, widespread malnutrition among the tribal people in the country is primarily due to lack of adequate food grains, unhygienic and poor lifestyle, poor nutritional intake additional causal factors like low access to land, large family size, faulty feeding habits, low purchasing power, lack of clean drinking water facilities, recurrent infections, lack of sanitation facilities, and low productions of food grains. Moreover, malnutrition and hunger, particularly during early development and early childhood cause a generational poor and low-performance in school, downward spiral of poor health, lower-income, family stress and instability, and an unmaintainable cost to a nation's economy and its development. Importantly, proper food intake is most for a human being in order to lead a healthy life. The importance and role of good and nutritious food intake are very essential in the early childhood for leading a healthy and active life and that will contribute to the growth and development of the nations in later time. Moreover, food and nutritional security not only depends on production and distribution but also depend on the consumption of the household in society (NIN, 2011).

The recent NFHS-IV found that, despite development and improvements, the under nutrition among tribal communities have remained at a high rate in comparison to other communities in the country. The report found that, there are more than 44 percent children are stunted below five years of old, 54 percent children are underweight and 27 percent children are wasted in the tribal areas of the country (Shrivastava, 2018). Furthermore, reduction of under nutrition among the tribal communities is the key to the overall reduction in under nutrition in the country.

Moreover, the fundamental, underlying and immediate factors are responsible for under nutrition among the people in our country. The factors like low food intake, various diseases, various social and economic factors, poor access to health, low-income status household food insecurity, and environmental factors are the main cause of under nutrition among the people in our country. Furthermore, supplementary reasons like lack of access to market, lack of development, cultural differences, various forms of discrimination, and lack of access to public services, geographical isolation, lack of awareness, the spread of education, and unhygienic food consumption are responsible for food insecurity among the tribal people across the country. "The development policy implemented for accomplishing economic development is not compatible with the tribal development policy". That means, tribal people have not benefited from the country's development and growth over the last two decades throughout the country. The various studies show that the extra-large scale development projects have not helped the indigenous communities the way it is supposed rather prove to be substantial obstacles in the tribal development throughout the country. There are large and huge numbers of displaced tribal people from their original habitats due to various developmental projects in India (GoI, 2005).

2.5.1. Tribal, Food, and Nutrition Security

V. Subramanyam (1997) perceived in his study on dietary habits that the staple food of all the tribal is *amboli* (gruel), which is made up of with ragi (millet) flour. Furthermore, the rice-growing households take rice at least once in a day. However, the consumption of non-vegetarian diet is very less in all the tribal, and they have it occasionally. In the vegetarian diet, they make curries with seasonally available vegetables like beans, brinjal, tomato, water gourd, drumstick, pumpkin and pulses. They make chutney with the inflorescence of tamarind fruit, chilly, and red gram. The consumption levels of vegetables, pulses, leafy vegetables and meat are also very less among the Gadaba tribes. Singh (1997) studied the nutritional status of the tribal pregnant woman of Bastar district, and he found that their energy and protein intake was very low and inadequate. Importantly, they are not aware of the concept of a balanced diet and the need for increased body demand during pregnancy.

V. S. Vyas (2004) studied about the different classes where food insecurity is highest among the marginal farmers, agricultural labourers, and the tribal people. Moreover, the two main groups that are socially and economically disadvantaged in India are the SCs and the STs.

Chakrabarty and Chand (2006) revealed that the STs had been socially and economically deprived because of their segregation from both geographically as well as culturally from the mainstream society. The habitation in difficult far-flung terrains and the lack of alternative investment opportunities in their communities have led to the tribal to depend on wage labour, subsistence agriculture and forest. Tagade (2012) attempted to scrutinize the food insecurity among the indigenous communities and also identified the major factors that determine the nutritional outcome of those communities (taking account underweight children as the important parameter) in Maharashtra. Experimental substantiation showed that the high poverty food insecurity, malnutrition and low food intake resulting in low-calorie intake among the indigenous communities in comparison to other communities in Maharashtra. The author found that the various factors such as low agricultural income, lack of education, lack of buying capability and low landholding among the tribal people are the significant factors responsible for under nutrition in the tribal areas of the state.

Patel (2014) studied the third world countries, including India, a substantial proportion of the people are suffering from hunger and starvation death. In other words, hunger, mainly arising out of chronic poverty, is caused not due to lack of supply of foodgrains but due to low purchasing power to buy food. The most exposed and unprotected are the more impoverished sections like ST communities living in states like Odisha. Nayak and Korakora (2018) studied tribal children and women's nutritional status in the Nawarangpur district of the KBK Region in Odisha. They mainly focused on the food habits of the tribal people, various food and non-food factors that influence the food and nutritional security status of the community. Das and Mehta (2015) analyzed that the worst levels of malnutrition of tribal children are compared to non-tribal, attributable primarily to chronic food insecurity and deeper poverty levels among tribal households. IIPS (2015-16) found that all evidence on health and nutrition of tribal communities most bears the brunt of malnutrition, morbidity and mortality in India. There are visible inequities in the health and nutritional status of the ST communities in comparison to the general population in the country. According to NFHs-IV, underweight among under-five children is ten percentage points higher for STs (45.3 per cent) children as compared to the total population (35.7 per cent). The incidence of anaemia is four percentage points higher in children (under five years of age) belonging from the ST (63.3 per cent) background as compared to total figure (58.5

per cent). Furthermore, women from ST background are 1.5 times more likely to be in the 'thin' (31.7 per cent) category compared to the total population (22.3 per cent).

2.5.2. Tribal and Welfare Schemes

Dreze and Sen (1989) strongly voiced for strong public action to eliminate poverty and starvation death in the country. Furthermore, state action for eliminating those needs can take different forms like food production, food distribution, and income and employment generation activities regularly, relief operation in the form of employment for wages in kind or cash, provision for healthcare and epidemic control, etc., through the expansion of productive activities. Tripathy (2004) highlighted the fight against starvation death, hunger and under nutrition in the KBK Region of Odisha and he mentioned the need for synergy among the policymakers, state and the common people for better results. The Odisha government has taken a lot of policy initiatives and action plans for the overall development in that region. However, the success of development policy, particularly food security measure relies on this community participation to a great extent. The various policies aimed for tribal people's food and nutrition security should depend on ground realities, reducing corruption in the various welfare scheme, giving proper more autonomy to the tribal people, more storage facilities in their areas, proper functioning of various welfare schemes and providing more land access and most importantly development of transport and communication facilities in the KBK Region of the state. Moreover, the success of the above schemes will depend upon the state government strong initiatives, proper monitoring and evaluation of the schemes, proper designing, and proper implementation of welfare schemes are the most necessary condition for the success of the schemes in the tribal region of Odisha.

IHD and WFP (2008) underlined the importance of social change like the spread of awareness among the tribal people and providing health care facilities to the tribal people are the primary requirement to facilitate towards development and more progress in that region of Odisha. The study found that the tribal and most vulnerable communities are unfortunately not covered by primary health care and primary education in the tribal region of the state. Moreover, the study also found that, there are lots of villages are having access to welfare schemes, communication facilities, basic health care facilities, access to clean drinking water, and electricity in the tribal region of the state. There is few studies show that, well-functioning of

PDS has increased the consumption among the people in the country. There are few other studies done in the state of Chhattisgarh and it shows that better functioning of PDS has increased nutritional intake among the people in a larger way.

Xaxa (2014) studied the food security problem among the tribal people in the remote region of Odisha. She found that, most of them are landless due to presence of forest and mountain regions; they mostly get various products services from the forest for their daily survival apart from the government welfare schemes. He also found that, from May to October, the tribal people do not have sufficient food to eat. The welfare programme like PDS has to play a significant role in providing food grains, particularly in those months. However, they encountered several problems in accessing the PDS. She gave an example of Nakkamamudi Panchayat in Malkangiri district which is highly backward and underdeveloped districts within the KBK districts where majority people suffer from food insecurity and malnutrition due to poor transport and communication. Those communities are unable to get food grains and other essential items from the ration shops, particularly in the rainy season. There are few studies found that, the tribal sub-plan expenditure has been reduced in the last five year plan due to some reasons in the country. Ranglal (2019) mentioned that, in many community feeding programmes, safety, hygiene, and nutrition are often ignored, and other hazards pose a health risk to the people. Furthermore, there are various employment programmes and the Forest Rights Act, 2006 are also given due attention as they affect the household income/food basket.

2.5.3. Tribal, Food Security, and Coping Strategy

Patel (2014) studied about the coping strategy mechanism of the tribal in the remote villages of Odisha where he found that, they use two ways of dealing with hunger like, consumption of inferior food items (tubers, fibres, fruits and several forms of minor millets), and borrowing from neighbours. More importantly, the food insecurity is so severe that a single strategy fails to solve the problem, so much so that the households have to resort to a combination of strategies. In those villages, 67 per cent of the households relied on all these strategies (separately or combined) to cope with hunger. There are few studies highlighted that, some households apply less coping strategies during the first phase of food insecurity but later apply more when, there will be more food insecurity within the households.

Sarkar and Shekhar, (2017) studied about the coping strategy especially related to the applying short term plan to food consumption pattern that comprises the attempt to raise the foodgrains availability at the household level and dietary change, to the reduction of household members and applying few rationing approaches. Moreover, livelihood coping mechanisms are because of the shortage of food, and those are supportive of food-insecure households to sustain their life rather than to make theme food secure directly. These include: sending children for work, selling assets, working as casual labour, livestocks, and compromising with health care etc.

Sarkar and Shekhar (2017) analyzed that how a typical family applies various methods to deal with food insecurity such as reducing the consumption of food among the family members, sending few members to other regions, and decreasing the income shocks in their household. Furthermore, the different households apply different coping mechanisms like the reduction of the number of meal in a day, reducing the consumption of food grains among the adult members for giving food to the children, borrowing from neighbours and relatives, cutting down expensive foods, buying more cheaper foods, and selling of livestock. Mohapatra (2017) studied coping strategy among the tribal people (Rayagada District) of the state, and he found that, they get lots of essential products and services and also get income by selling the forest products in the local market; it is the most important source of livelihood and food security during the time of food shortage or food crisis among the tribal people in that district. In other words, he mentioned that, the jungle and forest play a very significant role in providing both livelihood and food security to the tribal people during the time of food crisis in that region.

2.5.4. Tribal, Food Security, and Forest Rights

Guha 1996, and Singh (1982) found that the economic condition of tribal communities had begun to deteriorate in the British Era, and also, because of the inflow of the outsider in the tribal region and their subsequent infringement and capturing the forest areas further heightened the situation in different parts of the country. Primitive tribes live in the natural forest ecosystem of the country. Moreover, different kinds of forest produce available from natural flora and fauna constitute the ingredients of their dietary system of the tribal communities. Moreover, the jungle and forest is the most important source of food security among the tribal communities and also an important part of their identity.

In other words, “the tribal community's relationship with the forest is one of belonging rather than ownership, where community forest management is good for the health of the forests”. Furthermore, the tribal people have common rights to collect different products from the forests and they are more likely to sanction and monitor those who breakdown the laws and rules, causing in enhanced forest conditions. In the opinion of great Nobel Laureate Economist, the late Elinor Ostrom, who supported for universal forest land and forest rights. There are few studies supported the theory of Ostrom. Living Farms of the studies mentioned that, the ecosystem of the jungle is expected to be much developed in terms of a large number of variety of trees, high density of forests and the availability of food when it managed and looked after by the tribal communities. Tribal people considered that forest gives them different essential foods, different meats, firewood, fodder, and all they require in day to day life, it is our God and our mother.

Aggrawal (2011) mentioned that tribes as indigenous communities are mostly dependent on the natural resources for sustaining their lives and livelihoods. Furthermore, this centre around two major means like land and forest of means of production and that is repeatedly designated as two important pillars of the tribal society. He mentioned that, deforestation, natural calamities and entry of outside people in their areas threats to forest-based livelihoods, as being practised by the tribal communities, mainly affect income capacities, raising challenging issues related to food security. Aggrawal (2011) found that illegal cutting of forests by non-tribal invaders is affecting tribal livelihood and food security in Odisha. He mentioned that forests are central both better livelihoods and secure food security and, “State of the World's Forests (SOFO) 2016,” published by the Food and Agriculture Organization (FAO) mention that, "the forests of the future will increase the resilience of communities by providing wood energy, fodder, food, shelter, and fibre; providing income and employment and also allow to communities and societies to prosper; and harbouring biodiversity.” In other words, forest plays an important and significant role in providing food security to the tribal people in the state.

2.5.5. Tribal and Right to Food

Jean Dreze (2004) talked about the right to food and democracy, where he mentioned about the right to food of the poor tribal people in the country. He cited that the right to food forms one of the elementary economic and social rights indispensable to attain ‘economic democracy’ in the country. This right is nowhere near realization in the country, where under nutrition among the

tribal people is highest in the country. The foremost and important responsibilities of the governments, institutions, and individuals should protect the right to food of the poor people in the country.

Xaxa (2014) also studied the essence and importance of the right to food among the tribal people in the country, particularly focusing on Odisha and Chhattisgarh. In her opinion, food security is nothing but freedom from malnutrition and hunger. Moreover, hunger mainly defined and recognized as the two square meals a day by a narrow meaning. But the author defined the hunger in a different way where it indicates that the under nutrition among the people will define the broader meaning of hunger in the society. Hence, "the right to be free from under nutrition would mean and include other entitlements such as clean water, primary education and basic health care." Amit Kumar (2017) mentioned that the Right to Food makes a positive change in the lives of the local people, mostly Adivasi in the country. Anumeha Yadav (2018) studied the Right to Food of the Parhaiya Adivasi community in Jharkhand, and she found that due to lack of having Aadhaar card, poor tribal people are denied PDS items. Furthermore, because of those issues and problems, maximum tribal households are denied to access the PDS, and that led to food insecurity and hunger among those communities in the state. Moreover, they do not have the purchasing power for adequate protection to fulfill their daily needs.

2.6: Conclusion

To conclude, the above chapter discussed the various studies carried out by the scholars, researchers, different organisations on issues related to food and nutrition security and their link with other vital variables. The most likely problem found to be climate change and its impact on the production, productivity, and income of the farmers which directly and indirectly influence the food and nutritional condition of the various walk of people in the whole world. The above chapter highlighted the coping mechanism to deal with hunger and food crisis in different parts of the world and India. The study also underlined the important of forest right and right to food for achieving the food security among the poor people in the country. The third chapter talks about the changing agrarian structure and its impact on a landholding pattern, changing production pattern, changing per capita availability and finally, the food security status of the people.

Chapter- III
Changing Agrarian Structure and Food Grain Availability in Odisha

3.1: Introduction

India is a sustained agrarian economy, where the heart of the country lies in its villages and the majority of population still relies on agriculture for earning and livelihood. And, Odisha is no exception, where farming sector holds the center-stage in the overall growth and progress of the state (Mishra, 2009). In the state, around 84 percent populations are living in the rural areas, and more than 70 percent populations earn their livelihood from agriculture sector. In addition to that, this sector contributes 26 percent to the state's GDP (Economic Survey, Govt. of Odisha, 2016-17). The state has achieved a high growth rate in food grain production and productivity of major crops during the last ten years due to extension of agricultural area and better policy coordination in the state (Patra, 2017). Some food crops have achieved positive productivity growth, and under the non-foodgrains category, vegetables achieved the highest productivity growth (2.48 percent) followed by spices for the last five years in the state (Economic Survey, Govt. of Odisha, 2016-17).

Since couple of years, it is being observed that, there are changes in agrarian structure in the state of Odisha. The change in agrarian structure encompasses the social, economic, and technical elements that determine and affect production and productivity in the agriculture sector. In other word, the agrarian structure refers to the land distribution by ownership/operational status, and the tenurial arrangements under which lands are leased out and leased in by different persons (Panda, 2018). This structure is determined by several factors such as the distribution of land by ownership/operational status along with the means of production, the pattern of land tenure, labour relation, production process, and scale of farm operations (Paulini, 1997). In addition to that, the other factors like the changing cropping pattern, production of food grains and productivity due to social and institutional policy determine the agrarian structure in Odisha and other states in India (Sarif, 2006).

The agricultural structure has changed dramatically over the periods, such as the variation in the food grains production and productivity was due to changes in landholding pattern, cropping pattern and agricultural policy in the state (Mishra, 2016). That leads to the change in the availability of per capita food grains in Odisha. The farmers have changed their cultivation

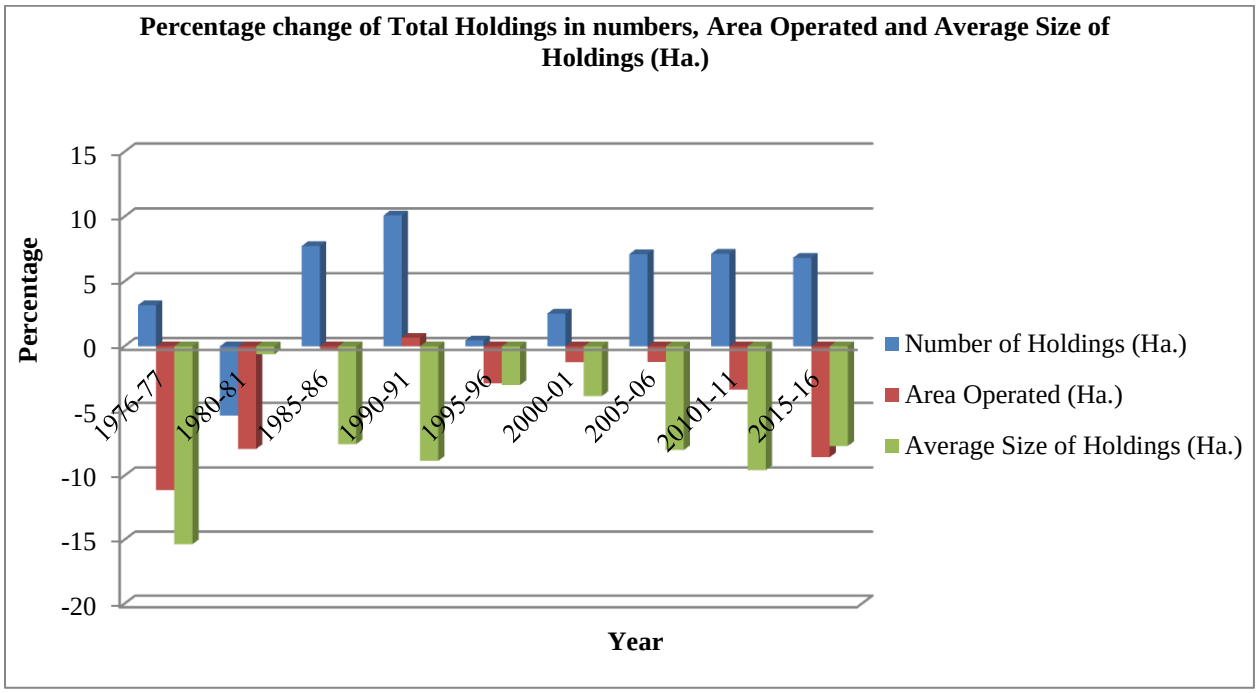
pattern from food crops to cash crops due to the change in agrarian structure, resulting in lesser availability of food grains in the state (Patnaik, 2004). Moreover, the paces of commercialization of agriculture and non-farm employment in the urban areas have changed drastically the rural economy, which has not only affected the agricultural production and productivity in general, but also per capita food availability at the national level and Odisha in particular (Nayak, 2016). Therefore, the present study is endeavored to provide an insight on the status of food grains availability and explore the reasons behind the change in agrarian structure in Odisha. The rests of the chapter are as follows.

3.2: Changing Pattern of Land Holdings in Odisha

Odisha is primarily an agrarian economy, where, agriculture holds the fundamental to the economic development, and the growth of agricultural income depends on agricultural output and cropping pattern in the state (Tripathy and Sarap, 1994). But, it remains backward due to several reasons such as unstable rainfall, traditional and prone to frequent natural calamities like droughts, floods, and cyclones (Pattnaik and Shah, 2010; Swain, 1999). The state's agriculture is undergoing heavy stress as average landholdings are decreasing day by day for the last two decades (Mahapatra, 2003). A very few percentage of the total population holds the majority of the total land area, whereas a large number of people own few acres of total land, which suggests high inequality in landholding in the state. That affects the state's agricultural condition in number of ways such as it affects the production of food grains, productivity and also farmer's income in the state. Except that, the state has witnessed a decline in the operational area due to urbanization and more non-agricultural use.

The growth rate of no. of holdings, area operated and average size of land holdings per family in Odisha during 1970-71 to 2015-16 are shown in Figure-3.1. It is seen that the number of holdings has been increased from 3.18% in 1976-77 to 6.83% in 2015-16, indicates slower growth rate of land holdings in the state. Both the area operated and average size of holdings have been negatively growing due to various factors such as population growth, breaking down of the joint family system, urbanisation, and industrialization in the state. But the latter is more negatively growing than earlier. Furthermore, the landholding patterns among the social groups have also changed, and the report says that the more SCs and STs groups are having fewer acres of land in the state.

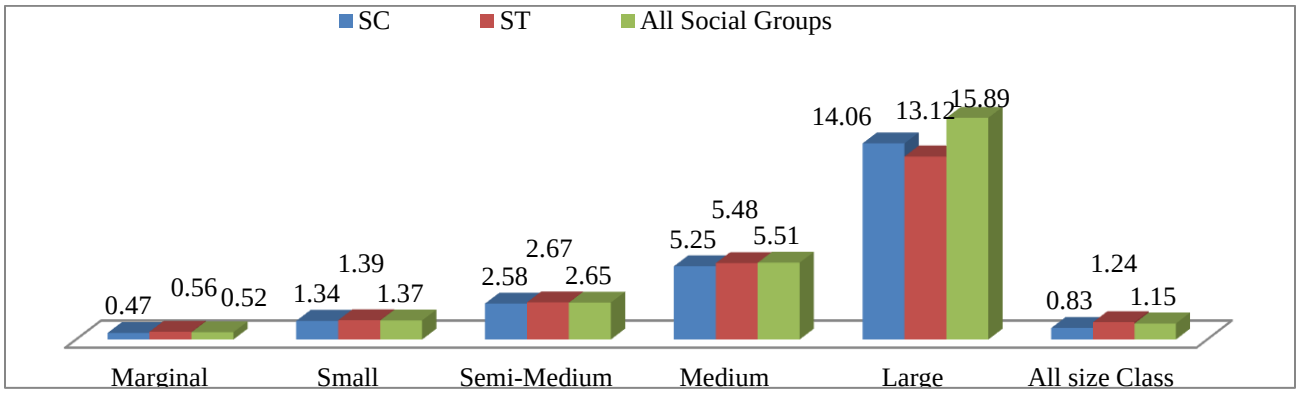
Figure-3.1: Percentage Growth Rate of Year-wise Total Holdings (in No.), Area Operated (Ha.) and Average Size of Holdings (Ha.) in Odisha



Source: Author's Calculation from the Agricultural Census, 2015-16

The above figure explained the percentage growth rate of year-wise land holdings in numbers, the area operated and the land holdings per family in Odisha from 1970-71 to 2015-16. From the above table, the number of holdings has been increased since then from 3.18 to 6.83 percentage change in 2016. It showed the positive growth rate of land holdings in the state. While the area operated has been declined since then due to various factors such as decline in soil fertility, population pressure, uneconomic holdings and inadequate irrigation facilities in the state (reference). It has decreased from 11.12 to -8.56 percentage change during 1970-71 to 2015-16. The average size of holdings shows the same trend as the area operated in the state. Moreover, it has decreased from 1.89 to 0.98 hectares during the period of 1970-71 to 2015-16 over the period. There are various factors responsible for decreasing the above variable, such as population growth, breaking down of the joint family system, urbanisation, and industrialization in the state. Furthermore, the landholding patterns among the social groups have also changed, and the report says that the more SCs and STs groups are having fewer acres of land in the state.

Figure-3.2: Caste-wise Average Size of Land Holdings in Odisha (2015-16)



Source: Author's Calculation from the Agricultural Census, 2015-16

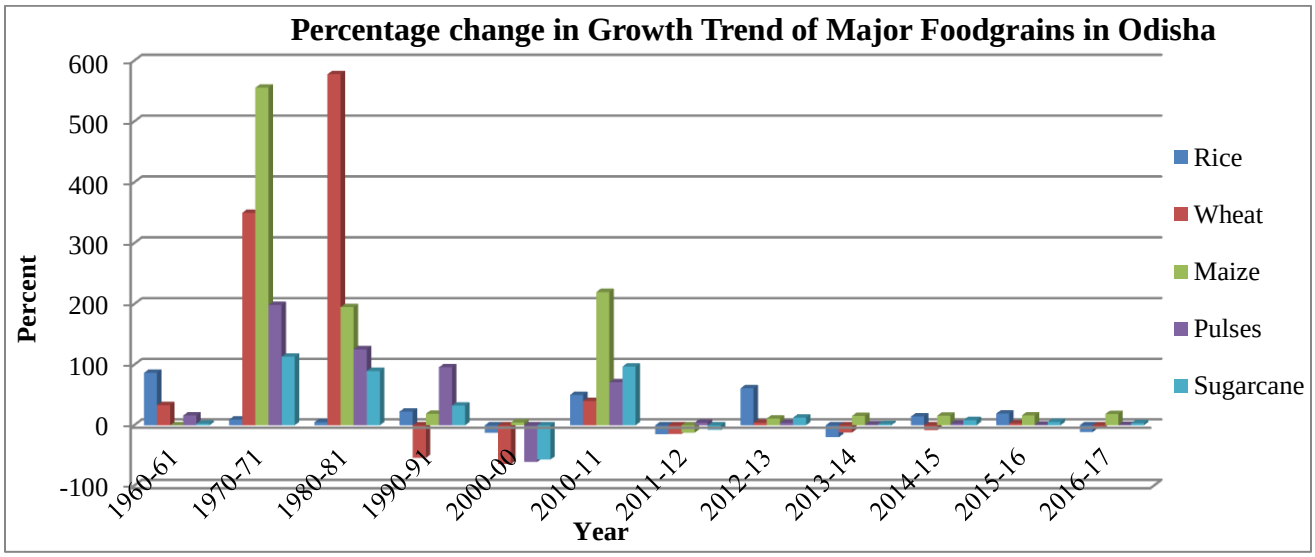
The above figure described the various caste wise land holding pattern in the state for 2015-16. It shows that the average size holding for all social groups in the state is 1.15 hectare as against 0.83 hectares for SCs and 1.24 hectare for STs Category. The average size in STs category is 0.09 point higher than the all social groups, whereas it is 0.32 point lower for SCs category. The per capita size of marginal, small and semi-medium of holdings of ST category is higher than the SCs and all social groups, whereas under the medium and large type, the per capita land holdings of all social groups are more than SCs and STs holdings due to various reasons like land tenure systems prevailed during the Colonial Era. The overall figure tells that, the maximum land owned by the large size holder followed by marginal and small landholdings, it shows that there is an increase in inequality of landholdings among the various caste wise groups in the state, where the land reforms has unable to bring tangible change in the distribution of land among the different sections of the society in the state.

3.3: Food Grain Production and Change of Cropping Pattern in Odisha

The change of cropping pattern among the various crops and food grain production are closely related and also both are dependent on each other. That means cropping pattern change affects food grain production in the number of ways. As the various reports show that the production pattern has changed drastically from food crops to cash crops due to several factors like change in consumption pattern, lack of good Minimum Support Price (MSP), and climate change in the state. Moreover, the state has registered a remarkable increase in foodgrains production for the last two decades due to various reasons. Furthermore, the food grain production got enhanced from 55 lakh metric tons in 2000-2001 to 118 lakh metric tons in 2016-17 (Economic Survey,

Govt. of Odisha, 2017-18). "The food grains comprise cereals and pulses, rice, maize, ragi, wheat, jowar, bajra & small millets crops grown in the state come under cereals and arhar, mung, biri, kulthi, cowpea, field pea, gram and other the crops like wheat, bajra, jowar, and small millets are grown to a lesser extent. Moreover, mung, red grams and kulthi crops mostly grown during Rabi Season." The area and production of major food grains since 1960-61 to 2016-17 indicated below.

Figure-3.3: The Percentage Change in Growth Trend of Major Food Grain Productions in Odisha



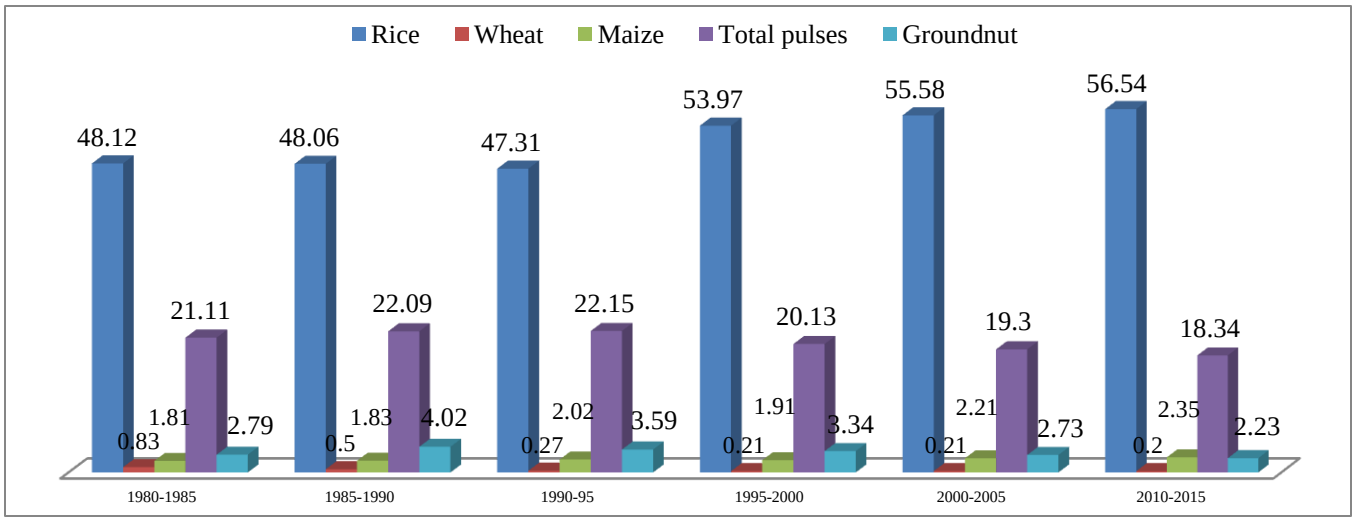
Source: Author's Calculation from Odisha Agricultural Statistics, 2017- 18

The above figure tried to explain the change in the growing trend of primary foodgrains production in the state. It shows that there is a fluctuation of all major food crops due to various factors in the state. The production of rice shows a negative trend, -11.25 percentage changes in 2016-17 followed by other crops due to multiple factors. Moreover, wheat also shows the same pattern. However, maize is showing a positive direction at 18.75 percentage change. While the growth rate of pulse production has been declining since 2011-12 but showing a positive trend. Likewise, sugarcane shows the same, but the positive growth rate of 2.02 percentage change and groundnut shows negative (-2.34) point change in the same year. The growth rate of oilseeds shows a positive trend at 1.9 point change. However, the overall growth trend of total food grain production shows the negative trend at (10.5) point change in the state. The growth trend of some food grains is positive, and some are negative trend due to multiple factors in the state. The

several factors like agricultural policy, rising food grain prices, climate change and changing dietary pattern are responsible for the change in the production of major foodgrains in the state.

From 1980-2015, some cereals (wheat, ragi, jowar, bajra and small millets); rabi pulses; oilseeds (castor, linseed, and safflower); and cash crops (jute, mesta, tobacco) deteriorated by varying degrees, whereas selected cereals (rice and maize); oilseed crop sunflower; cash crop cotton; and condiment and spice crop ginger were augmented. Likewise, the vegetable crops like potato, sweet potato, and onion have not shown any clear pattern of changes during the period studied (Nayak, 2015). Furthermore, based on a similar periodical trend change, the cropping pattern across the selected 30 crops revealed three major groups. Firstly, where the area under crops got shot up from 50 percent to around 60 percent; Secondly, crops in which area decreased from about 25 percent to 16 percent, and thirdly, crops group sharing between 12 percent and 15 percent area, did not reveal any clear trend of increasing or decreasing area.

Figure-3.4: Percentage Change in Cropping Pattern in Odisha from 1980 to 2015



Source: Author's Calculation from Agricultural Census, Government of Odisha, 2015-16

The above figure elucidated the cropping pattern trend from 1980-85 to 2010-2015 in the state. The gross cropped area under rice has improved from 48.1 percent in 1980-85 to 55.6 percent in 2015-16 due to rise in population in the state. The gross cropped area of Wheat

decreased from 0.83 percent to 0.2 percent in the same period. However, the gross cropped area of maize has increased from 1.81 to 2.35 during the same period due to the increase in consumption of maize. The area under total pulses got dropped from 21.11 percent in 1980-85 to 18.34 percent in 2010-15. There is a small decline in the area under groundnut from 2.79 percent in 1980 to 2.23 percent in 2015. Furthermore, there is a marginal rise in the area under cash crops, which is due to better prices and less cost of cultivation. Hence, the temporal fluctuations in the cropping pattern reveal crop diversification of the state. The overall picture tells that more people shifting their cultivation from food crops to cash crops for better remuneration and income in the state (Nayak, 2015).

3.4: Changing Pattern of Productivity of Major Crops in Odisha

The state has achieved remarkable growth and progress in the agrarian sector for the last decade. However, the thousands of small, marginal and large farmers have contributed to the growth and development of the agricultural sector, and also those farmers are the backbone of the economy in the state. Lenka (2013) mentioned about the contribution made by the farming community to the development of agriculture sector. “By the term agricultural productivity, we mean the different relationship between the agricultural output and one of the major inputs such as land”. It is nothing but the yield per hectare of land. The yield per hectare of all crops excluding few crops have shown a rising trend because of application of sophisticated and modern agricultural machinery, application of the intensive method of cultivation, adoption of a variety of hybrid seeds and better irrigation facilities in the state. However, the growth trend in the productivity of major crops showing a negative trend due to several factors over the years in the state. The state government should take various policy initiatives like providing agricultural inputs to the small and marginal farmers, conservation of soils, public investment in social and economic infrastructure, research and extension for the crops, production strategies, and providing the better price to the farmers will help the increase in production, productivity and availability in the state.

Table-3.1: Percentage Change in Productivity of Major Crops in Odisha (in Kgs/Ha)

Years	Rice	Pulses	Sugarcane	Oilseeds	Cotton	Groundnut
1975-76	5.45	-15.76	21.64	-4.14	-34.24	-0.56
1980-81	6.1	10.54	-4.77	5.28	-12.37	8.5
1985-86	15.69	10.7	3.44	19	-10.18	7.01
1990-91	0.93	-3.16	12.13	4.85	26.47	-1.67
1995-96	14.77	-0.54	-5.36	-9.14	58.14	0.21
2000-01	-24.29	-33.39	-2.33	-28.82	-16.76	-25.12
2005-06	49.28	15.62	3.49	25.8	53.71	46.22
2010-11	5.53	13.98	2.75	23.95	26.44	8.6
2015-16	-5.37	-6.17	-10	-35	-1.58	4.08
2016-17	8.46	7.24	3.48	18.28	20.45	5.9
2017-18	13.25	14.45	5.44	14.58	24.98	12.35
2018-19	19.45	9.65	4.78	9.85	19.35	11.75
2019-20	-16.68	-12.55	-7.25	-25.65	-14.45	-6.34

Source: Author's Calculation from Odisha Agricultural Statistics at Glance, 2015-16 and Various Rounds of Economic Survey, Govt. of Odisha, 2019-20

The above table explicated the percentage change of productivity of major crops in the state from 1975-76 to 2015-16. It shows that there is a fluctuation in productivity of all the above food crops due to various reasons. The yield rate for rice declined from 5.45 in 1975-76 to -16.68 percentage in 2019-20 likewise from 19.98 in 1975-76 to -48.21 percentage in 2019-20 for maize followed by pulses from -15.76 in 1975-76 to -12.55 percentage in 2019-20. The yield rate of sugarcane, oilseeds, and cotton show a similar trend in the same year except for the groundnut. The yield rate of groundnut is initially negative in 1975-76 and fluctuated in the middle and then bounced back towards the positive trend. The yield rate was -0.56 on 1975-76 then increased to 4.08 percentage in 2015-16 but it is negative in 2019-20 by -6.34 due to erratic rainfall in the state. The yield rate of sugarcane declined from 21.64 percentage in 1975-76 to negative -7.25 percentage in 2019-20. All the above major foodgrains are showing negative trends in 2019-20. Population growth, shrinking size of land holdings and lack of institutional credit facilities, and rising input prices are the major factors responsible for the negative trend of yield rate in the state (Patra, 2003).

3.5: The Status of Per Capita Availability of Food Grains Production in Odisha

The state is an agricultural state, and the state's entire economy depends on this sector. It is life and livelihoods of the people in the state, "where almost nearly 70 percent of people depend on agriculture for their livelihood and income". The state produces enough food grains for the state's requirements. However, still, the per capita availability of food grains in the state is deficient in comparison to all India level. The countries' per capita availability is well ahead of the state's availability of food grains per people. It is the reason behind the state's hunger and malnutrition in the state (Shiva Bandana, 2007). Moreover, the hunger and malnutrition are very high among the tribal people in the KBK Region as the state government has neglected over the period. The study found factors like low buying capability, low land holdings, low availability of foodgrains, and lack of proper functioning of various welfare schemes are significantly responsible for poor per capita availability of foodgrains among the SCs and tribal communities in the state (Mahamalik, 2014). There are various reasons for the declining the per capita availability of food grains in the state, like due to changing patterns of consumption, taste, and habits of the people and shrinkage of land holdings, population growth, more importantly, due to increasing in income of the people and also many more factors (Panda, 2011).

The below table presents percentage change in availability of foodgrains like per capita foodgrains, oilseeds, cereals, pulses, and sugar from 1955-56 to 2019-20 in the state. The above table shows that there is a fluctuating and declining trend of all the above food grains over the periods. In other words, starting from the cereals in the year from 1955-56 to 2019-20, it shows that there is declining trend of cereals (- 19.15) percentage resulting in the less availability of foodgrains per person in the state. Moreover, pulses showing the same pattern (-38.38) followed by food grains (-13.28) percentage in 2019-20 and oilseeds (-46.56) percentage due to different factors causing in a low foodgrains availability among the people. Furthermore, only sugar showed a positive trend (17.5) percentage in 2019-20. The overall picture tells that there is a decline in the availability of foodgrains among the people except for the sugar in the state.

Table- 3.2: Percentage Change of Availability of Food grains per person in Odisha (Grm/Day)

Years	Pulses (Whole Grain)	Food Grains	Oil Seeds (Seeds)	Sugar
1955-56	15.62	-6.1	-9.09	-11.76
1960-61	-24.32	52.84	0	-26.66
1965-66	25	-18.61	50	109.09
1970-71	34.28	24.4	53.33	-17.39
1975-76	2.12	-1.05	34.78	63.15
1980-81	54.16	-2.47	41.93	-6.45
1985-86	13.51	5.98	43.18	-6.89
1990-91	-2.38	-7.7	12.69	3.7
1995-96	-7.31	3.15	-16.9	-14.28
2000-01	-60.52	-35.79	-61.01	-41.66
2005-06	80	10.89	95.65	28.57
2010-11	-11.11	9.09	-24.44	-11.11
2015-16	-27.08	-11.9	-40	37.5
2016-17	-25.42	-7.45	-28.12	38.45
2017-18	-15.56	5.18	-17.75	42.95
2018-19	-10.35	8.64	19.65	39.4
2019-20	-38.38	-13.28	-46.56	17.64

Source: Author's Calculation from Various Rounds of Economic Surveys up to 2019-20, Govt. of Odisha

3.6: The Changing Pattern of Food Consumption in Odisha

The consumption expenditure is an important and essential indicator of the standard of living of the people. Papola (1992) mentioned that, the share of expenditure on food items would decrease and expenditure on non-food items will increase as the economy grows over the period. The share of food expenditure has been declining in Odisha and at the same time; there is a rise in non-food expenditure of the people since 2000. The study observed and found that the total expenditure on food items has been showing a negative trend and at the same time, the share of non-food expenditure showing a positive trend due to several factors in the state. The study also found that, there is a large variation in rural-urban consumption expenditure within the state. There has been a declining share of expenditure on food items from 68.03 percent in 1993-94 to 51.98 percent 2011-12 in the rural areas of the state. On the other hand, there has been an increasing share of expenditure on non-food items form 31.94 percent in 1993-94 to 48.02

percent 2011-12 in the rural areas of the state. And it shows that, the consumption pattern of the people got diversified for last two decades. Therefore, better access to market and improved awareness among the people has led to the rise in consumption of non-food items over the years in the state. Furthermore, several researchers have addressed the issue of the consumption pattern since the formulation of the Engel's law (1857), which states that "the share of expenditure on food in total expenditure tends to decline with a rise in income." Although various reviews have already been completed on the "Consumption Pattern" at the national level since 1960 (Bhattacharya and Mahalanobis(1967), Mukhopadhyay(1987), Meenakshi (1996), Radhakrishnan and Ravi (1992), very few studies have done at the regional level particularly in Odisha (Panda & Sarangi 2006, Pujari 2004, Sahoo, 2014). The reviews mainly confined to the estimation of expenditure elasticity of various commodities in rural and urban areas and the social groups for cross-sectional analysis in the state.

3.6.1: Trends in Consumption Pattern in the Rural Area of Odisha

The current research describes the changes in rural household's consumption pattern from food to non-food expenditure because of increase in income of the people, due to changes lifestyle, urbanization, the modernity of the society and most importantly impact of Liberalization, Privatization, and Globalization (LPG) plans and policies in the country. There is an increase of income elasticity of demand due to a change in income of the people. The study observed that, the modernity of the society has significantly influenced and affected the traditional monthly expenditure of the rural households in the country. The study also found that, "there is a decline in food expenditure and the increases in the non-food expenditure are higher in Rural Odisha (RO) in comparison with Urban Odisha (UO)." The expenditure pattern and share on food items has been declining; it is the other food expenditure share (like beverages, fruits, and vegetables), that shows a rising trend over time.

It may be due to better road connectivity to the urban areas which results in the availability of market facilities in rural areas and the increase in the monetization in the rural economy. In Rural Odisha, the level and composition of expenditure differ over the years. The share of expenditure of rice in Rural Odisha is more than double that of Urban Odisha, and over the years it declines by half of the original share of 1972-73. In Rural Odisha, it is the non-cereal items (pulses, milk, edible oil, meat-egg & fish) which have shown increasing trends is faster but

in absolute terms, In the rural economies, the share of cereal & its product has declined whereas the share of non-cereal (milk, edible oil, and meat-egg-fish) is increasing. Among the non-food, the share of pan, tobacco & intoxicant has declined, and the demand for fuel & light, other non-food (education, health, durable goods, etc.) has been increasing, which is a sign for the development of the economy.

Table-3.3: Trends in Consumption Pattern in Rural Odisha from 1972-73 to 2011-12

(Percentage Share of Items in Total Expenditure)

Year	Rice	Wheat	Cereals	Pulses & Products	Milk Products	Edible Oils	Meat, Egg & Fishes	Pan, Tobacco & others	Fuel & Lightening	Clothing	All Other Food Items
1972-73	47.25	2.6	52.35	2.29	1.43	2.52	3.18	3.26	6.46	5.94	24.94
1977-78	45.59	1.7	49.46	2.29	1.77	2.73	3.24	3.01	6.89	7.03	28.59
1983-84	45.7	3.04	50.05	2.07	1.52	2.7	3.34	2.62	7.47	6.16	26.36
1987-88	38.98	1.44	41.43	2.67	2.27	3.8	4.04	2.78	9.06	5.98	31.11
1993-94	37.45	1.01	38.97	2.66	2.4	3.14	4.12	2.93	9.23	4.86	31.94
1999-00	33.93	1.61	36.01	2.82	2.09	2.9	3.63	2.67	8	6.56	35.88
2004-05	26.48	1.55	28.25	2.87	2.55	4.05	4.19	2.61	11.81	3.63	38.42
2009-10	16.83	1.4	18.64	3.57	2.27	3.56	6.2	2.67	9.84	5.64	38.09
2011-12	14.75	1.22	18.41	3.57	2.99	3.88	8.95	2.12	12.19	7.41	39.01

Source: Sarvekshna Report Number 2, 2011-12

The above table 3.5 explained the trends in consumption patterns in the rural areas of the state. It is seen from the above table that, there has been a declining trend in total household expenditure on food items while the expenditure on non-food items has increased for last two decades in the state but there is a large variation on the level and composition of expenditure in rural and urban areas of the state. The share of food expenditure over the years from 1972-73 to 2011-12 has increased in Rural Odisha (24.94 percent to 39.1 percent). The portion of non-food expenditure in the whole expenditure has been showing increasing trends over the years (34.94 percent to 48.09 percent). The above table also explains that, there is a huge change in the consumption pattern has taken place over the years due to multiple factors like taste and preferences of the people, dietary change, and increase in income of the people, due to urbanization, due to population growth and several factors in the state.

3.6.2: The Trends in Consumption Pattern in the Urban Area of Odisha

The various studies and reviews show that, there are regular changes of consumption pattern in both food and non-food consumption expenditure of the urban households because of changes in food intake, the level of income, changes in taste and preferences, modernity of the society, standard of living and due to LPG plans and policies of the government in the state. Furthermore, there is a declining trend in the share of expenditure on non-cereal food items excluding fish, egg and meat over the period in the state. That means, households shifting their consumption from cereals to non-cereals (it is called diversification of consumption) mainly due to the increase of the income level in Odisha. Moreover, in Rural Odisha, the share of expenditure on rice is twice more than Urban Odisha while the share of cereal for Rural Odisha is two-fourths of the Urban Odisha, which implies that the cereal basket for Odisha mostly consists of rice. In the case of milk, the share of Urban Odisha is more than twice the Rural Odisha. The share for wheat in Urban Odisha is higher in comparison to Rural Odisha. The following table has explained the trends in urban consumption patterns in the state.

Table.3.4: Trends in Consumption Pattern in Urban Odisha from 1972-73 to 2011-12 (Percentage Share of Items in Total Expenditure)

Year	Rice	Wheat	Cereals	Pulses and its Products	Milk Products	Edible Oils	Meat, Egg, and Fishes	Pan, Tobacco, and Others	Fuel & Lightening	Clothing	All Other Food Items
1972-73	26.37	0.88	29.21	2.92	4.86	3.74	4.25	3.32	5.26	5.58	34.61
1977-78	24.39	4.36	29.14	3.24	5.86	4.31	4.29	2.67	6.36	7.82	33.98
1983-84	27.18	4.24	31.65	2.85	4.03	3.9	4.73	2.5	6.9	7.77	34.68
1987-88	18.66	3.32	22.02	3.25	5.76	4.92	4.88	2.72	7.13	6.89	39.27
1993-94	16.89	2.91	19.87	2.89	4.93	3.47	5.01	2.76	7.43	5.25	42.22
1999-00	18.83	7.53	22.69	3.15	4.72	2.99	4.64	1.95	8.35	6.2	43.04
2004-05	13.51	3.25	16.79	2.5	4.74	3.24	4.46	1.75	10.39	3.69	50.06
2009-10	9.38	2.45	11.85	2.68	3.5	2.42	5.18	1.77	7.24	5.23	51.62
2011-12	7.85	2.95	7.45	2.98	5.35	2.15	7.54	1.85	8.65	7.75	52.75

Source: Sarvekshna Report Number 2 & NSSO Reports

The above table shows that the food share in total spending got dipped in Urban Odisha. The share of expenditure on non-food to the total expenditure has been increasing in Urban Odisha (34.61 percent to 52.75 percent). From the above table, the shares of rice, wheat, and cereals have declined over the period due to various factors. While the consumption of pulses, milk products, and edible oil has increased in the same period. Moreover, consumption of fishes,

egg, and meat also increased more in urban areas compared to rural areas in the state. In addition to this, tobacco products, fuel, and lightning and even consumption of clothing have increased in the same period. And, the share of food expenditure in urban areas is higher than Rural Odisha. The share of cereal expenditure in both Rural and Urban Odisha declined to a third of the comparison in 1972-73 over the years, and the fall is faster in the case of later.

3.7: Public Distribution System (PDS) in Odisha

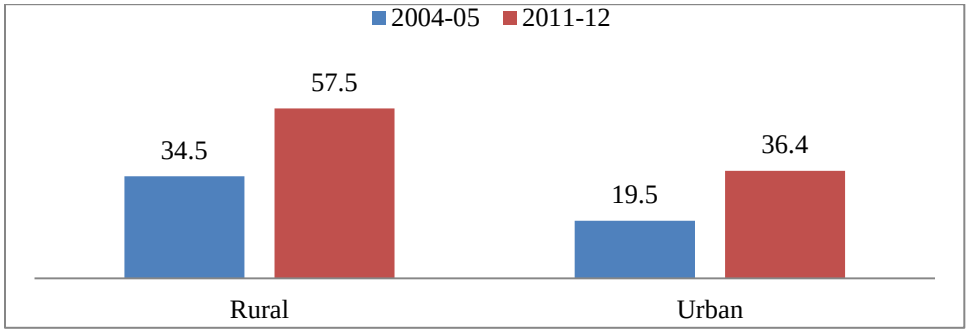
The Public Distribution System (PDS) launched by the government of India in the late thirties in order to provide the necessary food items to the public, particularly in the urban areas of the country. After independence and later in the year 1970 onwards, the main objective and plans were to provide the basic and necessary items like wheat, rice, kerosene and sugar at highly low prices particularly to the weaker sections of the society. This welfare scheme is one of the most important welfare programmes for providing food security to the poor people in the country, and it is one of the largest social safety net providing subsidized food grains to the more impoverished people in the country (Swamainathan, 2004). The PDS has been started functioning very long ago in different forms in Odisha. Furthermore, now it is one of the essential welfare schemes among the many for the more impoverished people in the state. The scheme has benefited to the huge number of poor people in the state. It has provided food security and helped to improve the standard of living of the downtrodden section of the society (Sarif and Mahamalick, 2005). Moreover, more importantly, the scheme has helped poor people to come out from poverty in the KBK Region where large numbers of poor and malnourished people live in the state (Shiva, 2006). Moreover, for the last decade, the state government has done a fantastic job in providing food and nutrition security, particularly in the KBK Region and all this is possible due to better implementation, coordination, low corruption and awareness among the people has helped the scheme to reach out the large number of people in the state (Panda, 2009).

3.7.1: Utilization of PDS in Odisha

The most and extensive welfare scheme like PDS was set to give essential items at subsidized rates to the poor people in the country. Since the inception of the scheme, it had covered and provided food grains to all the people due to shortages of food grains throughout the country, but the introduction of TPDS schemes in 1997; it has shifted from universal to targeted scheme where only targeted poor people will avail the benefits of subsidized food grains in the country. And it also benefits the APL families at an economical cost. The present study also found among the households throughout the country where households are purchasing high and better quality of food grains from the markets rather than from the ration shops due to poor quality of food grains and most importantly due to rising in income level. The households are getting other benefits from while buying from the market compared to ration shops. Himanshu and Sen (2013) found that, the coverage and spread of PDS have increased hugely in rural and urban areas and it has also covered more poor and non-poor in the system instead of declining in the country.

Firstly, access to food and adequate nutrition are essential requirement for all-round human development of a human being. For poor households in under developing countries like India, the phenomenon of food insecurity arises mainly due to low and fluctuating earning and lack of proactive resources. With a very poor material resource base, such households have to depend on an essential on earning from employment for sustenance. The utilization of the PDS by a different section of people in the different regions varies from region to region in the state. Some studies show that as the quantity of sugar and kerosene oil received per households is low, most of the households have utilized their items for their self-consumption and did not sell or utilize them for other purposes due to the price disparity between the PDS items and open-market prices was not very high. However, in the case of rice, the situation is different. At the state level that bought rice through PDS varies from 60 to 75 percent, they utilized for their self-consumption. The maximum percentages of people in the state use rice mainly for self-consumption. According to Parikh, 78 percent of the rural households have purchased rice from the public distribution in Odisha.

Figure-3.5: Percent of Population buying Cereals from PDS in Odisha (NSSO 61st and 68th Rounds)



Source: Author's calculation from NSS Rounds, 2011-12

The above figure describes the percent of the population buying cereals from ration shops in the state from 2004-05 to 2011-12. From the above figure; there is a positive trend among the people in both areas of Odisha. The percent of buying increased to 57.5 percent in 2011-12 from 34.5 percent in 2004-05 in rural areas, whereas it is increased to 36.4 percent in 2011-12 from 19.5 percent in 2004-05 in urban regions. However, one thing would be noticeable from the figure; the share of rural areas is higher than the urban areas of the state. Moreover, the increase in percentage of purchase from PDS is possible due to better implementation of the programs, reduced corruption, coordination and better management. The welfare scheme like PDS is one among the most essential public intervention programme for providing and improving food security of the poor people in the country.

The PDS provides subsidized food grains (and other essential commodities) through a network of 'fair price shops.' And it is considered as a principal instrument in the hands of State governments for providing a safety net to the poor against the spiraling rise in prices of essential commodities. The study observed from the secondary data; there are the numbers of BPL families in the country are not purchasing the whole quota of foodgrains from the ration shops due to various reasons like due to lack of purchasing power, FPSs situated in the long distance, low quality of items and corruption in the country. In other words, the study also found that a BPL family purchased 12.6 kg of rice/wheat from the ration shops in each month on an average where the family is supposed to buy 35 kg of rice/wheat per month. The study came to cross some reviews where majority BPL households could not able to buy ration items from the PDS shops due to higher price of PDS items compared of the open market price in the different parts

of the country. “This pattern does not fit in the ‘dual pricing’ models commonly used to analyze the PDS”. The following below table explained the utilization of PDS in different states of India.

Table-3.5: PDS Utilization in Various States of the Country (Two NSS Rounds)

States	% of Households Using PDS		
	2004-05	2011-12	% age Point Improvement in PDS Use
Andhra Pradesh	58.5	76.1	17.6
Assam	8.4	52.7	44.3
Bihar	1.9	42.7	40.8
Chhattisgarh	24.2	57.5	33.3
Delhi	5.7	12.3	6.6
Gujarat	25.5	22.7	-2.8
Haryana	4.3	16.2	11.9
Himachal Pradesh	51.6	89.5	37.9
Jammu & Kashmir	39.5	79.6	40.1
Jharkhand	5.5	29.6	24.1
Karnataka	50	63.1	13.1
Kerala	39.7	81.9	42.2
Madhya Pradesh	20.8	36.6	15.8
Maharashtra	22.1	33.1	11
Odisha	**18.6**	**63.3**	**44.7**
Punjab	0.5	19.8	19.3
Rajasthan	10.2	25.4	15.2
Tamil Nadu	72.7	87.1	14.4
Uttar Pradesh	5.7	25.4	19.7
Uttarakhand	21	69	48
West Bengal	13.2	44.6	31.4
All India	22.4	44.5	22.1

Source: Himanshu and Sen (2013a)

The above table discusses the utilization of PDS among the states in the country, as a percentage of people benefitted from the system throughout the country. There are some states like TN, HP, Kerala and Jammu and Kashmir perform better over other states due to various factors. Furthermore, it is seen from the table that, most southern states are performed better over other states due to low corruption, better implementation, and awareness among the people (except Himachal Pradesh). The state like TN stands out among them, where 87 percent of people utilize the PDS followed by Karnataka and Andhra Pradesh. However, the state like Odisha has improved a lot in 2011 compared to 2005, as there is 63 percent of people utilized the

PDS. It shows that, the PDS has a tremendous influence on the status of food security among the people in the state.

3.7.2: Trends in Income Transfer through PDS in Odisha

The Odisha economy has experienced a sustained period of high growth rate in the last two decades. However, the economic achievement of the state has had very partial positive bearing on the incidence of under nutrition among the people in the state. The state's child under nutrition levels have been and are still similar to those in the deprived regions of the world (Dasgupta, 2015). And more disturbing scenario is coming out from the tribal belt of the state where rising sections of people are slipping below the recommended calorie consumption even though overall income and consumption expenditure of the people are shooting up (Nayak, 2014). The study found that Odisha is one among the leading states in terms of extensive coverage and benefits of PDS programme accrued to the poor people in the country. In other words, the state of Odisha stood out among the other region in terms of income transfer per family for the last ten years due to better coordination, implementation, low corruption and awareness in Odisha. Furthermore, it has benefited poor people and also uplifted the poor people out of poverty in terms of increasing their food security status (Patra, 2012). The study found that income transfer from PDS in the rural areas is very high in comparison to the urban areas due to various factors like low corruption, more food items are provided to rural areas, digitalization of ration cards, awareness among the people and other factors of the state (Pradhan, 2019). The following table explains the income transfer both in rural and urban areas of Odisha.

Table-3.6: Trends in Income Transfer through PDS in Odisha (2004-05 Prices)

	Rural Area		Urban Area		All	
Year	PDS Subsidy (Rs./Person)	Share of Subsidy in Expenditure (%)	PDS Subsidy (Rs./Person)	Share of Subsidy in Expenditure (%)	PDS Subsidy (Rs./Person)	Share of Subsidy in Expenditure (%)
1993-94	74	1.1	126	1.2	98	1.1
2004-05	106	1.4	96	0.7	108	1.2
2009-10	294	3.0	232	1.2	294	2.4
2011-12	312	3.1	216	1.1	275	2.1

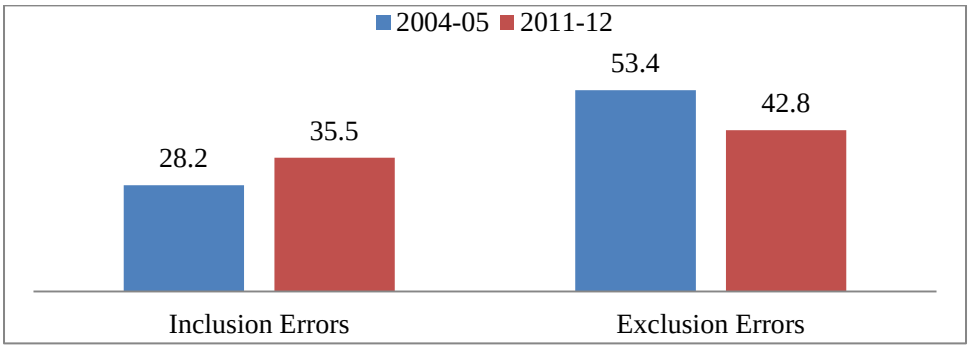
Source: Author's Calculation based on Unit Level Data from NSSO Surveys

The trends in income transfer or value of in-kind food transfers through PDS has been explained in the above table in the state. Moreover, the value of per capita PDS food transfers is calculated as the excess, if any, of the market cost of PDS purchases over what was actually incurred as out of pocket expenditure on them. And to sustain the temporal comparability, the PDS transfers were converted into real terms at 2004-05 prices. On an average, an amount of 276 rupees per person at 2004-05 prices was transferred to a household through PDS in 2011-12, up from Rs.74 in 1993-94 in the state. This transfer accounted for only 1.1 percent of the per capita consumption expenditure of a household in 1993-94, which increased to 2.1 percent in 2011-12. However, such transfer was higher in rural areas (312 rupees) than in urban areas (216 rupees). However, the transfer was pro-urban in 1993-94, wherein income transfer to the rural household was only 74 rupees per person in comparison to 126 rupees per person in urban areas of the state. Moreover, the changing trends in PDS transfers explicitly reflect the waning urban-bias, and its renewed pro-rural inclination, where the concentration of poor is higher. As a result the poor people are getting more benefit as the form of income transfer in the rural Odisha (Sahoo, 2020).

3.7.3: Targeting Errors in the PDS

The government of India faced significant and major challenges for identifying poor people after the introduction of TPDS in 1997. In other words, there are criteria problems and faulty methods for identifying poor and non-poor people resulted as the exclusion of more deserving and needy people out of the programme in the country. Dreze and Khera (2010) described that TPDS programme is full of both inclusion errors and exclusion errors focusing on the efficiency of this scheme in the country. Himanshu and Sen (2011) mentioned that food security could be achieved by a pure universal programme in the country. “Errors of targeting arise when attempts are made to distribute the benefits of a welfare scheme to a specific target group”. Furthermore, due to reasons like cost of participation, faulty measurement and imperfect information can lead to targeting errors in any targeted welfare schemes in the country. The study found, majority tribal people are excluded from the system due various reasons in Odisha.

Figure-3.6: Inclusion and Exclusion Errors in Odisha from 2004-05 to 2010-11



Source: Author's Estimation from IHDS Statistics, 2011-12

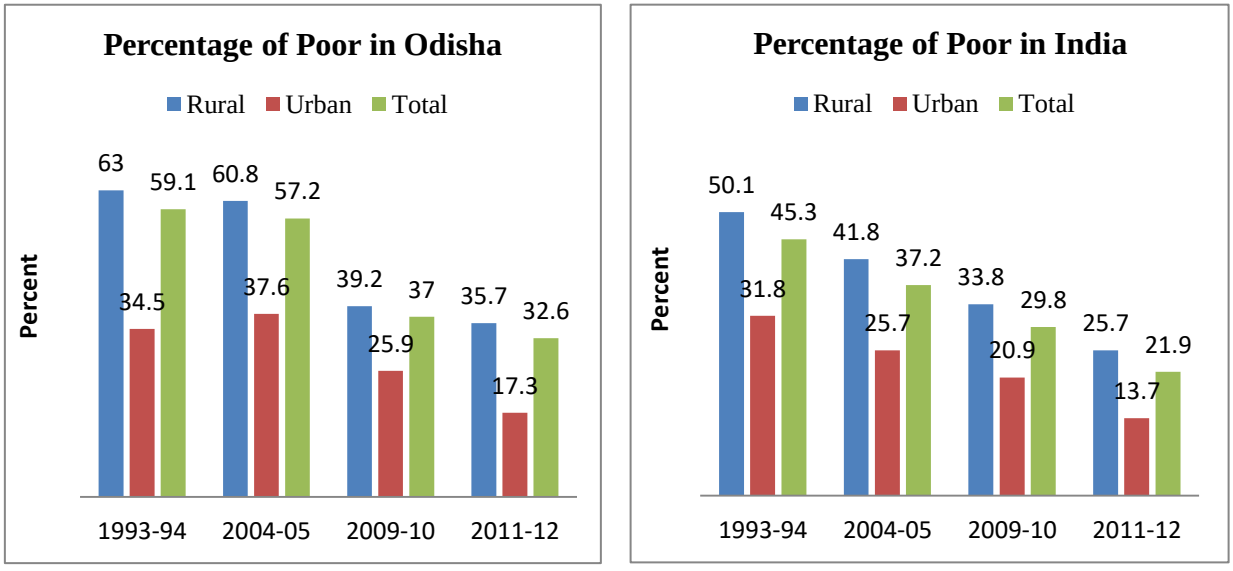
It is seen from the above table, inclusion errors have increased, that means more non-poor and wealthy people were included in the scheme while exclusion errors have declined which means the poor genuine people have been added more in the scheme due to several policy actions by the government of Odisha. Furthermore, the inclusion errors increased due to several factors from 28.2 percent in 2004-05 to 35.5 percent in 2011-12 in the State. However, more importantly, the rate of poor people who excluded earlier has come down. That is 53.4 percent in 2004-05 percent to 42.8 percent in 2011-12.

3.8- Poverty and Nutrition Security in Odisha

The state government and other organizations have been putting lots of effort for reducing poverty and eradicating under nutrition among the poor people in the state for a long time. The state has been ranked below in comparison to other states on various social-economic development indicators like per capita income level, literacy, food and nutrition index, health indicators, HDI index value, and economic-social infrastructure in the country. Although the state has reduced exceptionally poverty from 54 percent in 2005 to 32.6 percent in 201-17, but the growth rate of reduction in poverty is very sluggish in comparison to other states in the country over the period. The study discovered that, there are vulnerable people like single women, girl child, daily wage earners, landless families, Person with Physical Disabilities (PWD), scavengers, migrant people, slum dwellers, tribal and primitive tribal communities are significantly affected by the food and nutrition insecurity due to poverty and lack of adequate nutritious food in the state. The study also found that there is severe poverty among the poor people in general and particularly among the tribal people in the tribal belt of the state.

Furthermore, it leads to the problem like malnutrition, forced migration, sale of a child, human trafficking, low wage, and hunger and starvation deaths among the marginalized and poor tribal people with the non-existence of transport and communication facilities in the state. It is highlighted that, the government has totally failed in giving protection to those sections. The government must ensure that those people are covered by food and nutrition security so that it can help them to increase their standard of living and can lead a better and dignified life in the society. Despite the impressive growth rate and high level of production, still many people suffer from malnourishment and hunger in a different region of the state. Odisha has been considered as a backward state in the country for decades. It is in national headlines for child sale, hunger, starvation, malnutrition death, and many more problems. The state comes in the 2nd rank after Bihar in terms of the highest percentage of poor (Planning Commission, 2014). The Economic Reforms of 1991 though witnessed an increase in inequality; it recorded the highest poverty reduction at the national as well as among the states (Sen & Himanshu 2007, Dev & Ravi 2007). Samantaray and et al., (2014) found that the state has seen a higher growth rate and more poverty reduction in the last ten years due to better policy design and implementation that has helped to increase the relative social and economic position of the people.

Figure-3.7: Percentage of Poor People in Odisha and India Based on Tendulkar Methodology



Source: P. Sahoo, D. Sahoo and Subhas Chandra on Poverty among Occupational Groups

The above two figures give statistics about the percentage of poor people in Odisha and India beginning from the 27th Quinquennial Rounds. It is seen from the figure that, Odisha is having more percent of poor people in comparison to India in various NSS Rounds. There is only 2 percent point of poverty reduction in Odisha in comparison to 9 percent point in all India level after 1983 onwards. However, after 1983 onwards, the poverty rate among the people has been declining due to the implementation of various welfare schemes in the state. The poverty has been declined rapidly from 2004-05 to 2009-10 in the state, which is one of the fattest reducing states in India. The state has reduced poverty by 20 percent point in recent years due to various policy measures in comparison to only 7 percent point at all India level. "Both the rural sector and the combined sectors show the same trends over time, as the higher percentage of the poor population is residing in the villages both in the state and in the country". The state has to do a lot more in reducing poverty among the poor people in the state.

Table- 3.7: The Percent of Population and Contribution to Aggregate Poor in Odisha (Rural Area)

Rural Odisha	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Social Group	**% of Population**			**% of Total Poor**		
Scheduled Tribes	25.14	25.65	24.07	32.95	35.67	42.9
Scheduled Castes	18.52	17.59	21.79	18.47	19.61	25.28
Other Backward Castes	56.34	39.42	37.09	48.59	34.13	25.02
Others	-	17.34	17.05	-	10.6	6.79

Source: Author's Estimation from Consumer Expenditure Survey for 50th, 61st, & 68th

The above table explains about the composition of the total population in Rural Odisha, and it indicates that SCs and STs People both accounted for 44 percent of the total rural population in 2011-12 and together accounting for 51 percent of the poor population in Rural Odisha. It is the SCs & STs which show an increase in poverty contribution, whereas the poverty for OBCs and others has declined. The contribution to the total poor among the SCs and STs increases from 55 percent in 2004-05 to 68 percent in 2011-12. "Turning to rural household types, a population located in self-employed (agricultural as well as non-agricultural) households accounted for nearly 53 percent of the total rural population in the year 1993-94, which increases over the year in the state". The state government should focus and emphasis more to the rural areas in order to being a most developed states in the country. (Source)

Table-3.8: Percentage of Population and Contribution to Total Poor in Urban Odisha (Urban Area)

Urban Odisha	1993-94	2004-05	2011-12	1993-94	2004-05	2011-12
Social Groups	% of Population			% of Total Poor		
Scheduled Tribes	11.92	9	5.75	20.1	12.82	13.2
Scheduled Castes	13.14	13.69	22.99	14.85	23.07	34.99
Other Backward Castes	74.94	30.53	27	65.06	34.48	34.57
Others	-	46.78	44.26	-	29.64	17.24

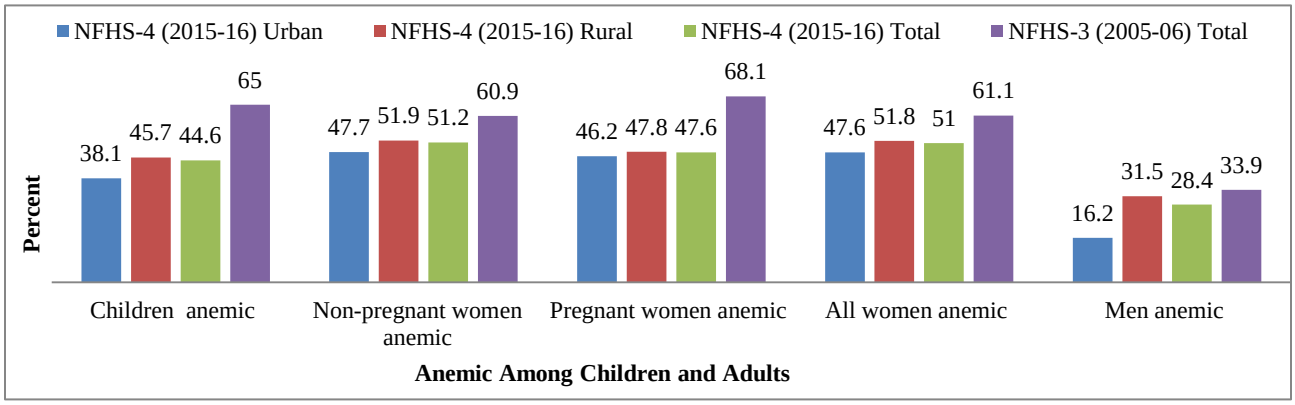
Source: Author's Calculation from NSSO Unit Level Data for 50th, 61st, & 68th Consumer Expenditure Survey

In the Urban Odisha, the STs and SCs both account for 25 percent of the urban population, which has increased to 28 percent in the year 2011-12. While these two groups contributed to the total urban poor is around 35 percent, which increases to 48 percent. The contribution to total urban poor for the SCs has been growing while for others it has seen declining. Moreover, the two principal household types such as self-employed families and wage and salaried families accounted for nearly 80 percent of the state's total population in Urban Odisha. "Population located in casual labour households formed 11 percent of the total in the residual category of 'others' accounting for the balance of 9 percent and with a share of nearly 43 percent in the total population, the self-employed constituted the dominant (43 percent) of the urban poor population in the state". The below figures explained the nutrition scenario of both rural and urban areas of the state in the various rounds.

The NFHS-IV provides a detailed report of the state's health and nutritional situation. It shows a bad and abysmal health status of the state, where more than 45 percent of people is malnourished, and 34 percent children are underweight. Menon (2009) mentioned that Odisha suffers from an alarming level of hunger and under nutrition, and it is one among the poorest states in our country. The study also found that, there is severe and sharp differences exist in the context of food security within the states where the coastal and eastern region is more food and nutrition secure over the western and southern region. The social and economic status influences the health status of an individual in the society and a healthier and well human being will have a greater capacity to work and earn than an unhealthy person and it will lead to a higher food security status. In other words, health is one of the most important components of human well-

being and it increases the economic activity of any country. There are various and important indicators that determine the health and nutritional status of any individual in the society. The study also discovered that, immunization and overall poverty has a close link with child mortality rate (below five years of age) and the infant mortality rate arises due to the poor reproductive health care facilities and lack of proper antenatal care in the state. However, all those above problems provide the useful information for assessing both public policy and social practices for improving the overall quality of life of the people in general and women and girl children in particular in the state.

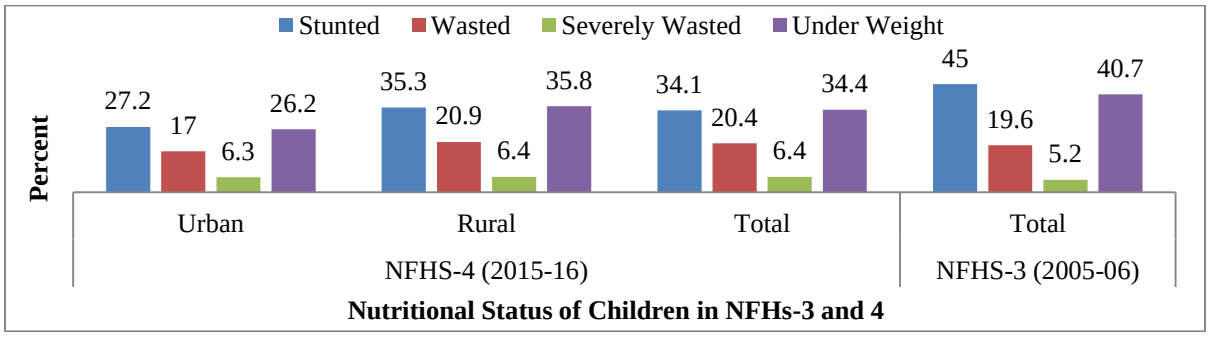
Figure-3.8: Nutritional Status of Adults in Odisha (15-49 Years)



Source: Author's Calculation from NFHS-IV, and IIPS-2015-16

The above figure tells about the anaemia among the children and adults in the state. From the above picture, 65 percent children are anaemic in urban areas followed by 60.9 percent non-pregnant women are anaemic in a rural area, and the total 68.1 percent are pregnant women in the state. It shows that the anaemic among the non-pregnant women is high followed by all women, pregnant women, children, and men, respectively, in the state. The anaemic is declined in 2015-16 among them as compared to the previous Third NFHS Report in the state.

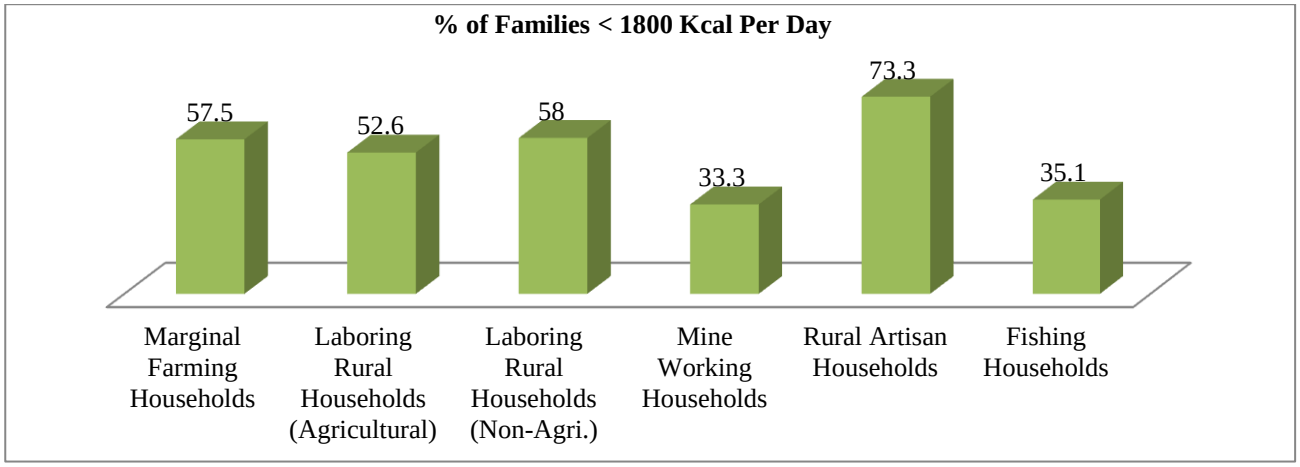
Figure-3.9: Nutritional Status of Children under 5 Years of Age in Odisha



Source: Author's Calculation from NFHS-IV, and IIPS-2015-16

The above figure describes the nutritional status of children under the age of five years old in NFHS-III and NFHS-IV in the state. It shows that the stunted among the children has declined from 45 percent in 2005-06 to 34.1 percent in 2015-16, wasted has increased to 20.4 percent in 2015-16 from 19.6 percent in 2005-06, severely wasted risen to 6.4 percent in 2015-16 from 5.2 percent in 2005-06 but the underweight among the children has also declined to 34.4 percent in 2015-16 from 40.7 percent in the state.

Figure-3.10: The Food Insecurity Condition among the Different Social Groups in Odisha



Source: Author's Calculation from NFHS-IV, 2015-16

The above figure tells the average percentage of families living with extreme food insecurity in the state. There are various types of households like marginal farming households, rural labour households in agriculture and non-agriculture, mine working households, rural artisan households and fishing households in the state. It shows that poverty among those groups remained high, means consuming less than 1800 kilocalories per day. The most 73.3 percent rural artisan households have extreme poverty (57.5 percent), followed by rural labour households 58 percent and then marginal farming households in the state. These vulnerable groups are having low assets and stay bottom of the social groups. The various factors are responsible for the low food intake and causing poverty among themselves in the state.

The below table explained the percent of stunted, wasted, anaemic and sanitation facilities in the different districts of the state. The maximum districts performed better in terms of reducing the proportion of wasted and stunted children while there are few districts, mainly KBK Region are have not able to achieve much in compared to the coastal part of the state due to various factors. The eight districts of KBK Region are mostly backward and underdeveloped and having unequal development and the main obstacle for reducing hunger and malnutrition, particularly among the tribal people as the area dominated by the indigenous communities in Odisha. The study also found that majority of SCs and STs population suffer from perpetual food insecurity, more marginalization and extreme poverty in the state. The following table explained the malnutrition status in the various districts of the state.

Table-3.9: Malnutrition Status in the Different Districts of Odisha

Districts	Malnutrition				
	Children under 5 years who are stunted (Height for Age) %	Children under 5 years who are wasted (Weight for Height) %	All women age 15-49 who are anaemic (%)	Women who are overweight or obese (BMI 25 kg/m2) %	Households using an improved sanitation facility (%)
Anugul	44.4	26.1	61.1	10.9	14.1
Balasore	32.2	18	68.5	15.8	37.3
Balangir	**32.4**	**33.7**	**49.9**	**14.75**	**26.4**
Boudh	42.2	22.5	43.5	8.7	16.4
Bhaadrak	34.9	15.3	37.8	13.9	23
Cuttack	15.3	9.1	42.8	28.5	38.8
Debagarh	33.4	19.9	42.6	10.8	30.9
Denkhanal	26.1	19	39.4	18.8	33.3
Gajapati	32.5	18.4	58.5	11.2	33.3
Ganjam	28.9	16.4	41.3	20.9	38.2
Jagatsinghpur	19.5	12.6	35.8	25.7	40.7
Jajpur	30.3	16.5	43.3	17.5	30.8
Jharsuguda	34.9	24.8	69.2	18.6	30.7
Kalahandi	36.6	24.8	68.7	9.6	40.3
Kandamal	38.4	23.1	52.7	8.2	14.9
Kendrapara	26.9	12.3	42.3	16.4	16.5
Keonjhar	44.6	19	40.5	13.9	25.6
Khordha	24.7	13.8	45.3	30.2	20.5
Koraput	40.3	28.5	63.3	10.2	47
Malkanagiri	45.7	32.5	71.3	6.2	18.2
Mayurbhanj	43.5	17.2	42.4	8.6	16.7
Nawarangpur	45.8	36	71.5	6.8	18.1
Nayagarh	28	17.5	39.8	22.8	16.1
Nuapada	37	26.4	64	5.8	36.6
Puri	16	12.1	44.3	25.3	20.2
Rayagada	**43.5**	**42.4**	**55.4**	**10**	**40.1**
Sambalpur	40.2	28.6	73	16.8	23.4
Sonepur	47.5	22.3	69.2	13.8	16
Sundargarh	37.2	31.4	71.4	13.6	39.9
Odisha	**34.1**	**20.4**	**51**	**16.5**	**29.4**
India	**38.4**	**21**	**73**	**20.7**	**48.4**

Source: NFHS-IV, 2015-16

The above table described the nutritional status among the people in the state. It is seen from the above table that, there are 34.1 percent stunted children and 20.4 percent wasted children below five years of age in the state. Furthermore, the severely affected malnourished children are almost 8 percent and severe malnutrition children are 30 percent in the state. There is 50 percent gap in Recommended Dietary Allowance (RDA) in the state. The research discovered that, there very few percent of children in different age groups receive less health benefits, including breast milk in the state. The study also found out that, 44.6 percent children and 51 percent women suffer from anaemic in Odisha. In other words, there are important factors like proper health care facilities; proper sanitation, clean drinking water facilities, hygiene and adequate food intake will have a strong bearing on the nutritional and health status of the people in the society. The study also found that, 77.7 percent households do not have toilets in their home in Odisha. There is no particular indicator to measure the micronutrient deficiency and obesity situation in the state. There are more than 16 percent of women and 17 percent of men are overweight in the state. Moreover, coming to the district level, the Sonepur is having 47.5 percent of children compared to Cuttack 15.3 percent. Likewise, the Nawarangpur district is having 36 percent wasted children in comparison to 9.1 percent in Cuttack district. While the anaemic rate is high in Nawarangpur district and is low in Bhadrak district. However, the striking result about the sanitization in the states reveals something different like Koraput districts is having 47 percent while Angul district has 17.1 percent. The State has done far better on overall performance in all the above parameters.

3.9: Conclusion

To conclude from the above chapter, the landholding pattern among the various social groups has changed due to multiple factors like break down of joint family system, urbanization, lack of irrigation facilities, increase of population, and erratic monsoon in the state. Furthermore, the food grain production has increased in many fold, and the cropping pattern changed from food crops to non-food crops after the green revolution period due to higher productivity, due to increase in income level of the families, due to change in dietary pattern of the people and better Minimum Support Prices (MSPs). Moreover, agricultural production shows acceleration trends, but these trends are limited to major cereals crops only. The availability of foodgrains per person has improved after the 1970s due to a green revolution. The consumption pattern has changed drastically among the people and also increased, but the per capita cereals and pulses have been declined among the people after the 1990s onwards for all social groups both in rural and urban areas of Odisha. However, poverty and nutritional security status among the people have improved due to proper policy implementation in the State. The next chapter discusses the different social and economic status of Odisha, KBK Region and the two districts. It also discussed the food and nutritional status of the KBK Region and Balangir and Rayagada district of the state.

Chapter - IV
Food and Nutritional Status in the KBK Region and the Two Districts

4.1: Introduction

Odisha is one of the most underdeveloped states in the country and recognizes the need for addressing health and nutritional problems existing in the state (OdishaPost, 2007). However, despite steady economic growth and development for the last two decades in the state, the majority of the population still suffers from hunger and malnutrition due to the non-implementation of effective policies and other socioeconomic factors (Nayak, 2013). The state has a sizable socio-economically disadvantaged population (SCs and STs), particularly in the KBK Region (Pattnaik, 2011). A significant proportion of the tribal populations continue to suffer from food insecurity and undernutrition in that region (Sarap and Mahamalik, 2015). The percentage of underweight children below the age of three in the state (45.7 percent) is just below the national rural average (49 percent) (NFHS-IV, 2015). In other words, malnutrition due to the low-income level is a crucial outcome of food insecurity in the state. In fact, malnourished mothers have a greater risk of giving birth to a low birth-weight baby because of their own undernutrition. And it transmits from one generation to another in the family (Xaxa, 2016). This problem is widely prevalent among the tribal communities in Odisha. High undernutrition prevalent among the poor tribal people spawns from lack of both adequate and nutritious food, basic health care benefits, safe drinking water, hygiene, and sanitation in the state (Nayak, 2015).

Panda (2015) found a very close relationship between maternal health and food insecurity and also the detrimental effects of hunger passing from one generation to another among the poor people in Odisha. Therefore, it has potentially detrimental effects on work capacity/productivity, thereby earning-capability of adult people, putting them at greater risk in the future. Several studies mentioned that reasonably underweight children are twice as expected to die from common contagious diseases than better-nourished children. According to NFHS-IV (2015), Odisha still has 34.4 percent underweight children, and 34.1 percent stunted children despite implementing several welfare schemes and policy initiatives. The main problem lies with the socioeconomic structure of Odisha, where most of the social welfare schemes and programs are not able to reach out to the needy lower strata of the society and particularly tribal areas of the state (Mishra, 2013). This chapter explains the socioeconomic profile along with food and nutritional status of the State, KBK Region, and the two districts.

4.2: Profile of Odisha

The State is situated in-between 170° 49/ N to 22 34 latitudes and 81° 29/ E to 87° 29/ E longitude on the Eastern part of India. The total area of Odisha is 155,707 sq. km. The state became an independent state on 1st April 1936 after being separated from Bihar. The state has adequate natural resources, including precious stones. The state's population size is 41,974,281, which accounts for 3.7 of the country's total population. It has 4.74 percent of the country's total land (Census, 2011). Nearly 85 percent of the population live in rural areas, and agriculture is the most important source of livelihood for the majority. According to one estimation of the Central Ground Water Board (CGWB), the total groundwater resource in the state is spread over 21, 01,128 hectares (Economic Survey, Govt. of Odisha, 2014-15). The two tables below explain the demographic and socioeconomic status and human development of the state.

Table- 4.1: The Socioeconomic and Demographic Profile of Odisha

Important Indicators	In Figures
Total Geographical Area (in Km.)	155, 707
Total Land Area in Square (in Km.)	1,55,707
The Total Population (in Crores)	4.1
Decadal Growth Rate (in Percent)	16.25
SC and ST Population (in Percent)	42.25
Sex Ratio (per Thousands)	972
Literacy Rate (in Percent)	72.4
Female Literacy Rate (in Percent)	50.5
MMR (Per Thousands)	235
IMR (Per Thousands)	51
Life Expectancy Rate (in Year)	68.5
Agricultural Labour (in Percent)	35
Total Workers (in Percent)	38.7
BPL (in Percent)	38.4

Source: Census Report, 2011 and Economic Survey, Government of Odisha, 2018-19.

Table- 4. 2: A Comparative Study of Development Indicators of Odisha and India

	Odisha	India
Human Development Indicators	2011	2011
Inequality adjusted human development index value (IHDI)	0.296	0.343
Inequality-adjusted human development index rank (out of 19)	17	21
The loss in HDI due to Inequalities (Percent)	33.11	32
Literacy Rate (Percent)	73.45	74.04
Male Literacy Rate (Percent)	82.4	82.14
Female Literacy Rate (Percent)	64.36	65.46

Source: UNDP, 2013-14

Table 4.2 presents the human development indicators of Odisha and India for comparison purposes. It shows that the state is far below the country's average in most of the indicators. However, Odisha has been doing well for the last decade in terms of development. The implementations of various welfare schemes have a tremendous impact on the people's standard of living in the state. The state has achieved a high growth rate for the last decade. It has mainly reduced poverty from 60 percent in 2005 to 32.6 percent in 2017 and improved the rate of literacy to a higher level. However, the state has to do a lot more to achieve high human development in the coming decade.

Map-4.1: Map of Odisha

SouSource: Odisha Economic Survey, 2014-15

4.3: Food Insecurity in Contemporary Odisha

The majority of the states in India face food and nutritional insecurity significantly for a long time, even after implementing a plethora of schemes and policy initiatives year after year (Mohapatra, 2020). In Odisha, most people suffer from hunger and malnutrition, which has kept the state continuously in the limelight for this wrong reason (Das and Penthoi, 2017). The present study tries to explain the food security pattern, particularly among the people in the state. It shows monthly variation in food consumption, and it further varies from region to region within the state. The food consumption pattern consists of rice, dal, vegetables, green leaves, and non-veg items. And, rice constitutes the bulk of the diet for the rural people, and it is the staple food for the people in the state.

Furthermore, rice consumption touches its peak in mid-October to mid-November after the harvesting of rice production. It stays at that level until mid-January to mid-February in the whole state. And then, the consumption of rice starts to decline among the people from mid-February to mid-March, although it remains high but followed by a stiff fall in mid-July to mid-August. The actual food insecurity periods among the people start from mid-May to mid-June, but more challenging periods where food shortage is very high start from mid-July to mid-October till the harvesting of rice is completed in the state. There is a huge variation in the consumption of vegetables and green leaves from month to month. The vegetables and green leaves consumption is high from mid-November to mid-December, and it falls from mid-April to mid-May and starts to rise from mid-June to mid-July. The consumption of other food items like potatoes, fish, and fruits does not change as much as rice, and it varies from family to family depending on the level of buying capacity in the state. The study also found that both male and female consumption pattern is very similar across the state. Another findings and observation made by the current study are that women folks consume less as compared to their male counterparts in typical households throughout the state. The most notable reason is that customary practice is followed and practiced by the women members after male members eat. Therefore, women members eat food (Barik, 2002). The above analysis of food security patterns across the state highlighted that people face food insecurity during the rainy season till harvesting. Food insecurity among women is higher as compared to the male counterparts in the state (Sahu, 2016).

Photo-4.1: Women and Children draw Drinking water from a Polluted Pond in Nagada Village of Jajpur District

Source: *Dharitri Odia Newspaper* 7/06/2015

From this Photo 4.1, tribal women and children collect water from a dirty pond for their drinking and cooking purposes. They do not have clean drinking water for daily use in their households in the Nagada village of Jajpur district. In other words, clean drinking water is very much essential for the body to digest and will have an overall positive impact on health and growth. However, it illustrates the worst reality about the safe and clean drinking water facilities of that village. Moreover, it shows that they do not have tubewell, borewell, and tap water facilities in their village. And, they mostly depend upon this pond throughout the year for all purposes. Therefore, the maximum numbers of people are being affected by gastro-intestinal infections such as diarrhea, diphtheria, dysentery, etc., leading to poor health in Nagada village.

Photo-4.2: Undernourished Women with their Children in a Weekly Market in Nagada Village of Jajpur District

Source: *Dharitri Odia Newspaper* 7/06/2015

The above Photo 4.2 talks about two undernourished women and their malnourished children in the weekly market of the Nagada village of Jajpur district in Odisha. These undernourished people are living in the coastal belt of the state. The pressing issue is the lack of quantity and quality of food grains, safe drinking water, and basic healthcare facilities. News of starvation deaths of 29 children was reported in June from that village. The village is far from the mainstream society, where access to necessities is a distant dream for them. There is no road and communication, no electricity, no PDS scheme, no other welfare schemes availed by them. They do not even fulfill one square meal in a day; they forget about the nutritious food that leads to food and nutrition insecurity among the tribal people in that village.

Table 4.3: The Food Security Outcome Index of the Different Districts in Odisha

Secure	Moderately Secure	Moderately Insecure	Severely Insecure	Extremely Insecure
Jharsuguda	Nayagarh	Dhenkanal	Balangir	Nuapada
	Cuttack	Mayurbhanj	Nabarabgapur	Rayagada
	Jagatsinghpur	Puri	Jajpur	Gajapati
	Balasore	Kendrapada	Sambalpur	Malkanagiri
		Khorda	Sonepur	Kandhamal
		Deogarh	Sundargarh	
		Angul	Keonjhar	
			Bhadrak	
			Bargarh	
			Baudh	
			Kalahandi	
			Ganjam	
			Koraput	

Source: Food Security Atlas of Rural Odisha, 2018

The above table describes the food security outcome status of the various districts in Odisha. It displays that some regions perform better in terms of food security over other districts in the state. For example, a district like Jhasruguda is more food secure, followed by moderately food secure districts like Nayagarh, Cuttack, Jagatsinghpur, and Balasore. On the other hand, the districts like Nuapada, Rayagada, Gajapati, Malknagiri, and Kandhamal are more food insecure districts. Moreover, the Food Security Outcome Index (FSOI) analysis of different districts gives Odisha a thrilling picture. All the eight districts in the Eastern Ghats region lie in the most food-insecure categories and most of the Central Tablelands. As we will see later, these districts have a higher proportion of forests and tribal populations in the state. Moreover, the Coastal Plains are relatively better-off, with only four of eleven districts in this category, two adjacent to the districts from the eastern parts. In other words, two of the four districts from the Northern Plateau region bordering Jharkhand are found in this category, while districts bordering Chhattisgarh also have similar figures. The industrialized district of Jharsuguda has the best outcome index in the whole state.

Table-4.4: Indicators used to compute Absorption Index in All Districts of Odisha

Districts	Access to Safe Drinking Water	Access to PHCs	Access to Toilet	Absorption Index
	Value (%)	Value (%)	Value (%)	Value (%)
Angul	39.35	16.31	17.5	0.268
Balangir	**43.87**	**24.3**	**9.3**	**0.519**
Balasore	86.33	33.87	14.6	0.658
Bargarh	83.26	47.62	8.9	0.742
Boudh	64.31	6.77	5.5	0.337
Bhadrak	88.63	28.55	11.3	0.632
Cuttack	50.05	22.8	25.9	0.375
Deogarh	56.16	9.05	8	0.308
Dhenkanal	31.34	23.38	12.1	0.276
Gajapati	43.29	19.68	9.7	0.315
Ganjam	57.89	18.67	19.2	0.389
Jagatsinghpur	77.98	36.16	13.3	0.629
Jajpur	42.37	27.11	14.9	0.365
Jharsuguda	62.81	31.87	20.8	0.513
Kalahandi	31.23	20.99	8.3	0.535
Kandhamal	32.03	19.18	10	0.249
Kendrapara	73.74	22.2	9.3	0.503
Keonjhar	52.39	14.81	10.3	0.33
Khordha	42.97	39.19	37.5	0.457
Koraput	27.26	22.35	13.1	0.468
Malkangiri	22.06	16.14	6.8	0.504
Mayurbhanj	43.9	21.37	8.8	0.331
Nabarangpur	30.37	28.41	6.9	0.585
Nayagarh	51.47	19.99	15.6	0.363
Nuapada	24.29	25.55	6.1	0.586
Puri	75.59	39.57	17.7	0.641
Rayagada	**23.11**	**13.24**	**10.3**	**0.461**
Sambalpur	56.48	13.48	18.6	0.343
Sonepur	26.28	14.1	6.7	0.457
Sundargarh	56.98	28.05	23.5	0.453

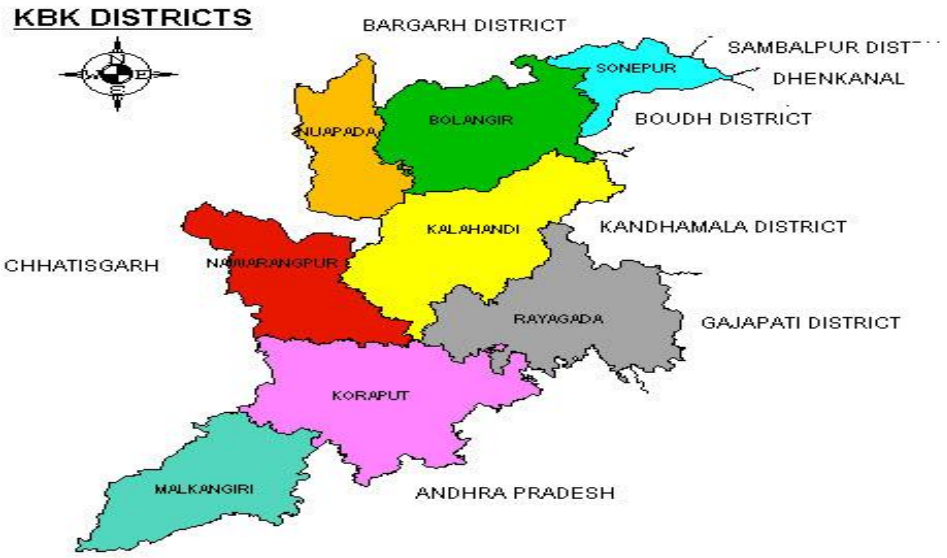
Source: Economic Survey, 2018-19, Government of Odisha

Table 4.4 describes the absorption index of different districts in the state. In Bhadrak district, 88.63 percent of families have clean drinking water followed by Balasore and Nuapada district 86.33 percent, and 84.29 percent correspondingly in the state. Similarly, the worst districts like Dhenkanal, Kandhamal, and Angul have 31.34 percent, 32.03 percent, and 39.35 percent have safe drinking water, respectively, in the state. In the case of access to Primary Health Centres (PHCs), the highest 47.62 percent of people access to PHC in Baragarh district, followed by Puri district 39.57 percent and Khorda district 39.19 percent. On the other hand, there are districts like Boudh, only 6.77 percent of people have access to PHCs, followed by Deogarh district 9.05 percent and Rayagada district 13.24 percent. In the Absorption Index (AI), the Bargarh district has the highest index of 0.742, followed by Balasore 0.658 and Puri 0.641. The districts like Kandhamal 0.249, Angul 0.268, and Dhenkanal 0.276 are the worst in terms of the AI in the state.

4.4: The Socioeconomic Status of the KBK Region

The undivided districts of Kalahandi, Balangir, and Koraput of the state, widely recognized as the KBK region, consists of eight most backward districts such as Koraput, Rayagada, Malkanagiri, Nawarangpur, Balangir, Sonepur, Kalahandi, and Nuapada is a distinctive region that has captured the attention of the globe due to forced migration, unemployment, malnutrition, hunger, starvation deaths, and persistent poverty as a result of undeveloped multidimensional characteristics. Furthermore, this region is impoverished and backward compared to the other parts of the state, even after implementing various welfare schemes and policy initiatives by different organizations in the state. However, the development and socioeconomic status remain the same as the region has specific fundamental problems even after the 73 years of independence in the state. The study discovered the various notable factors like difficulty hilly and mountain terrain making it difficult for development and spread of transport and communication facilities, lack of employment opportunities, lack of education, lack of basic health care facilities, lack of proper implementation of welfare schemes, and most importantly employment schemes, lack of awareness among the people and mammoth corruption in the various systems in this region. It is a wholly tribal region where more than 70 percent of people are SCs and STs population of the total KBK population in the state.

Map 4.2: Map of the KBK Region



Source: Economic Survey, Govt. of Odisha, 2014-15

The reports of hunger and starvation deaths among the tribal people are reported in various newspapers, and television channels in the summer of 2000 in Kashipur Block of Rayagada district in KBK Region had shaken the people's conscience not only in the state but also in the whole country. The most notable reason for the tribal people was that lack of adequate food grains to fulfill their stomach, at the same time, they had taken poisonous mango kernel or seeds (which is not eatable items), and as no other food items were available to the tribal people resulting near to starvation death in that block. The above-mentioned block (Kashipur) is not separate from other blocks in the Rayagada district, but it is very familiar and famous in the whole state; there are other blocks and districts in the tribal parts of the country where the same situations are happening. Furthermore, the sale of children because of their inability to feed their children, continuous migration due to lack of work, and, most importantly, hunger has brought international attention to the KBK Region of the state. Meena Menon (1999) wrote about the impoverished, drought-stricken area of the Kalahandi district in the KBK region. A man sold his daughter for 30 kg. of rice to fulfill hidden hunger, and he had no money to feed her. These are not isolated cases in those particular areas; instead, more cases will be in different parts of the country.

Table-4.5: The Backward Blocks of Eight Districts in the KBK Region

Districts	Total Blocks	Very Backward Blocks	Percent of Total Blocks
Balangir	**14**	**5**	**35.71**
Kalahandi	13	8	61.54
Koraput	14	9	64.28
Malkangiri	7	5	71.43
Nabarangpur	10	5	50
Nuapada	5	4	80
Rayagada	**11**	**9**	**81.82**
Sonepur	6	3	50
KBK Region	**80**	**53**	**66.25**
Rest of Odisha	234	27	11.24
Odisha	314	82	26.11

Source: Kar, Sarangi and Nanda, 2014

Note: Figures are in the table in percent

The above table tells that 66.25 percent of blocks are very backward and underdeveloped compared to 26.11 percent in the whole state and 11.54 percent in the rest. They have recognized 82 from the total of 314 blocks as backward and underdeveloped blocks in the state and out of which 53 blocks are in that region of the state. And 81.82 percent of backward blocks are found in the Rayagada district of the KBK region. The above table has explained the underdeveloped and backward blocks of the KBK region and the whole state. The following table describes the health status and also the socioeconomic position of the KBK region.

Table 4.6: The Socio-economic and Health Status of KBK Region (in Percent)

KBK Districts	Agricultural Laborers	Urbanization	Rural Literacy	Rural Female Literacy	Total STs Population	Child Mortality	Underweight Children	Anaemia among Children
Sonepur	46.4	7.4	61.7	44.7	10.2	120	47.8	55.6
Balangir	**43.3**	**11.5**	**52.7**	**35.8**	**22.6**	**157**	**40.6**	**39.8**
Nuapada	47.8	5.7	40.3	23.8	36.3	153	43.5	49.4
Kalahandi	52.5	7.5	43.5	26.5	30.4	158	56.1	48.4
Rayagada	**49.9**	**13.9**	**29.9**	**18.3**	**62.8**	**166**	**33.4**	**47.2**
Nabarangapur	54.1	5.8	31.3	18	57.8	136	57	24.9
Koraput	44.9	16.8	27.3	15.6	56.5	163	50.6	47.8
Malkangiri	26.8	6.9	27.9	18.4	60.6	110	58.2	44.9
KBK Region	**45.71**	**9.4**	**39.3**	**25.1**	**42.2**	**142**	**48.4**	**44.8**
Rest of the State	32.14	14.8	64.2	51.2	22.9	128	39.7	41.8
Odisha	39.1	15	59.8	46.7	24.6	66	34.4	22.7

Source: NFHS-IV, and Economic Survey, 2018-19, Govt. of Odisha

Table 4.6 speaks about the socioeconomic status that includes agricultural labour, urbanization, rural literacy, rural female literacy, and scheduled tribes population of the KBK Region; rest of the state and at the state level in 2015-16. The table shows that 54.1 percent of agricultural labour exists in the Nawarangpur district, whereas 43.3 percent in the Balangir district. It means that still more people are engaged in the farming sector in the region. In terms of urbanization, the Koraput district has the highest of 16.8 percent, and Nawarangpur has the lowest of 5.8 percent. In comparison, KBK average is 9.4 percent, rest of state average is 14.8 percent, 15 percent of urbanization in the whole state. The rural literacy rate is the highest in Sonepur district at 61.7 percent. Koraput district has the lowest literacy rate of 29.3 percent, KBK Region has39.3 percent, and the rest of the state has 64.2 percent, the overall state's literacy rate was 59.8 percent in 2014-15. It shows that the overall literacy rate in the KBK region and Odisha is meager as compared to other regions of the country. In the case of rural female literacy, 44.7 percent in Sonepur district whereas it 15.6 percent in Koraput district, 25.1 percent in KBK Region, 52.2 percent in rest of the state and 46.7 percent of the state level. It means that female literacy is very low, particularly in all districts of the KBK region. Furthermore, in terms of the composition of the tribal population, 62.8 percent of people are the tribal population in Rayagada district, 10.2 percent in Sonepur district, and 42.2 percent in KBK Region, 22.9 percent in the rest of the state, and 24.6 percent in the whole state. It shows that more than 24 percent of people are STs as a proportion of the state's whole population concentrated more in the southern part of the state. Table 4.6 describes the mortality and nutritional status among the children in KBK Region. It displays that the infant mortality rate is high in Rayagada district that is 106 per thousand infants, followed by Kalahandi and Malkangiri districts with 103 and 103 per thousand infants in the state. The infant mortality rate in KBK Region is 96 per 1000 infants and 86 in the rest of the state.

The Rayagada has the highest child mortality rate of 166 per thousand children, followed by Malkanagiri district with 158. Furthermore, it is 142 in the KBK region and 128 in the rest of the state. The Sonepur district has the highest Underweight children of 58.2 percent, followed by the Malkanagiri district of 56.1 percent. Furthermore, it is 48.4 percent in the KBK region and 39.7 percent in the rest of the state. The anemia among the children is high in the Balangir district, followed by the Koraput district. It is 44.8 percent in the KBK region and 41.8 percent in the rest of Odisha. The overall figure of the above development indicators describes that all the

KBK Region are very backward and underdeveloped as compared to districts of coastal parts of Odisha due to lack of development efforts from various fronts.

4.5: The Status of Health and Nutrition in KBK Region of Odisha

The KBK Region of Odisha continues to be one of the most backward and poorest regions despite its rich natural and human potential (Sahu, 2016). The disaster and emergencies compound poverty. The diluted public accountability and poor access and control over food and livelihoods entitlement programs like Targeted Public Distribution Program (TPDS), ICDS Supplementary nutrition program and Mid-Day Meal (MDM) program, and National Rural Employment Guarantee Program (EGP) do not generate the desired impact on hunger and nutrition (Penthoi, 2018). The KBK Region is one of the most underdeveloped regions of the state. It suffers from hunger, distress migration, and chronic poverty and is situated in the western part of the state. The state government has implemented the special universal PDS programme from 2008 onwards in order to reduce poverty and improve the food security status among the poor tribal people in the KBK Region (Behera, 2018).

Furthermore, nutrition is essential for a healthy life. It is the inevitable part of the human body. The KBK Region is one of the most underdeveloped areas in the whole state, where a maximum number of people suffer from malnutrition and starvation deaths (Pattnaik, 2013). The KBK Region of the state needs special attention and significance because of its multidimensional and typical problems mentioned above, affecting the poor tribal people in a significant manner for many years (Saraf, 2013). However, many villages in the region were not adequately covered by Primary Health Centres (PHCs). Many research studies mentioned that undernutrition perpetuates food poverty and reduces economic growth and development. Hence, it will lead to the loss of manpower productivity because of poor physical conditions and the rise of health care expenditure globally. Lack of adequate and proper food intake is one of the most critical factors for under-nutrition globally. They also analyzed other possible factors like lack of safe drinking water facilities, basic health care facilities, inadequate sanitation, and diseases, including insufficient micronutrients are responsible for undernutrition among the people throughout the world (Das and Sahu, 2018).

Table 4.7: Children and Adult's Nutritional Status in the KBK Region (in Percent)

KBK Region	Adults 15-49 Years of Age		Children Under-5 Years of Age			
	Low BMI-Women	Low BMI-Men	Stunted	Wasted	Severely Wasted	Under Weight
Balangir	**19.9**	**15.2**	**32.4**	**33.7**	**4.5**	**33.7**
Sonepur	32.2	18	47.5	22.3	5.4	43
Nuapada	36.1	26.4	45.8	36	11.6	51
Nawarangpur	34	27.4	37.6	26.4	9.2	40
Koraput	37.4	34.5	40.3	28.5	8.3	44.4
Kalahandi	34.2	30.4	36.6	24.8	9	39.7
Malkanagiri	45.9	26	45.7	32.5	8.4	51.8
Rayagada	**33.1**	**30.4**	**43.5**	**42.4**	**6**	**42.4**
KBK Region	**34.1**	**26.03**	**41.17**	**26.37**	**7.8**	**48.8**

Source: Author's Calculation from Economic Survey, 2018-19, NFHS-IV, and IIPS-2015-16

Table 4.7 explains children's and adults' nutritional status in the KBK Region of Odisha based on the NFHS-IV Data. It shows that the Malkanagiri district has the highest percentage (45 percent) of men with low BMI, whereas the Balangir district has fewer (19.9 percent) women. Likewise, the Koraput district has the highest (34.5 percent) of men with low BMI, whereas the Balangir district has fewer (15.2 percent) men. Furthermore, the Sonepur district has the highest (47.5 percent) stunted children, whereas the Balangir district has the lowest 32.4 percent. The Malkanagiri district has the highest (32.5 percent) wasted children, whereas the Balangir district has the most moderate 17.4 percent. The Nuapada district has the highest percentage of severely wasted children, whereas the Balangir district has the lowest at 4.5 percent. The Malkanagiri district has the highest 51.8 percent of children underweight, whereas Balangir district has the smallest 33.7 percent. There are 34.1 percent women and 26.03 percent men have low BMI, whereas 41.17 percent stunted children, 26.37 percent wasted children, 7.8 percent severely wasted, and finally, 43.25 percent are underweight in the whole KBK Region in the state according to NFHS-IV Report.

Table 4.8: Average Nutrient Intake in the KBK and Non-KBK Region (Per Person/Day)

	AAY		BPL		APL		No Card		Total	
	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12	2004-05	2011-12
	Non-KBK Region									
Calories (in kcal)	1945	2060.2	2013.6	2016.6	2246.1	2097.3	2014	2055.9	2076.8	2046.5
Fat (in grams)	44.5	47.7	46.8	47.2	53.9	50.7	47.9	49.6	49	48.6
Protein (in grams)	13.8	20.8	14.8	20.8	22.9	27.1	19.2	25.6	18.3	23.4
Non-Cereal Calories	319.7	407.8	356.1	429.9	536.2	543.8	456.9	526	433.6	477.6
KBK Region										
Calories	1698.7	1800	1558.2	1819.9	1891.7	1950.5	1775.9	1768.9	1674.6	1819
Fat	37.3	42	36	42	44.8	46.7	41	41.7	38.7	42.4
Protein	9.1	14.8	10.2	17.4	16.2	22.2	15.5	20.2	12.7	18.4
Non-Cereal Calories	183.4	330.5	215.2	361.9	342.9	449.5	352.2	422.9	278.7	383.2

Source: AndaleebRahman, 2015
Note: The Calorie is measured in kilocalories and Proteins, and fats are measured in grams.

Table 4.8 explains the KBK and non-KBK districts' average nutrient intake of cardholders in Odisha. It is seen from the table that the KBK Region's average per-capita consumption of calorie, protein, and fat of different card holds is lower than the Non-KBK Region in the state. In other words, the KBK region's mean per capita daily calorie intake is 1819 in 2011-12 compared to 2046.5 of the Non-KBK region. Additionally, the fat and protein of different cardholders in the KBK region are low compared to Non-KBK Region. Based on different ration cards, the nutrient intake of Above Poverty Line (APL) cardholders is better than the BPL cardholders because the daily intake of APL families is much higher than the BPL families in both these regions.

Photo 4.3: Women and Girls draw water from a Polluted Pond in Malkanagiri District

ମାଲକାନଗିରି ଜିଲ୍ଲା ମଜୁରୁଲେଣ୍ଡିରେ ନାଳପାଣିକୁ ଗାଧୁଆ ଓ ପିଇବା ପାଇଁ ବ୍ୟବହାର କରାଯାଉଛି । (ଫଟୋ: ଦୁର୍ଯ୍ୟୋଧନ ପାତ୍ର)

Source: *Odia Dharitri Newspaper*, 05/05/2017

The above Photo 4.3 talks about the safe and clean drinking water problem in Majurulendi village of the Malkanagiri district of the KBK region. It illustrates that women and children are taking water from a polluted pond for their cooking and drinking purposes while at the same time, children are also taking baths in the same pond. It signifies that they do not have tubewell, borewell, and tap water facilities. As a result, it leads to various diseases like diarrhea, waterborne disease, skin disease, and other diseases. Nevertheless, most importantly, it will affect the tribal people's food and nutrition security in that particular village.

Photo-4.4: Women and Girls draw Water from a Dirty Pond in Khompada Village of Koraput District

କୋରାପୁଟ ଜିଲା ଦଶମନ୍ତପୁର ବ୍ଲକ ଖୋମପଡା ଗାଁରେ ସ୍ଥାନୀୟ ଲୋକେ ଚୁଆଖୋଳି ପାଣି ସଂଗ୍ରହ କରୁଛନ୍ତି ।

Source: *Odia Dharitri Newspaper*, 9/4/2018

The above Photo 4.4 shows the drinking water problem faced by tribal people in Kompadavillage of the Koraput district of the KBK region. It further explains the lack of clean and safe drinking water facilities among the tribal people, leading to various diseases. In the above photo, tribal women and children collect water from a polluted pond for their cooking and drinking purposes. Moreover, due to the lack of tubewell, borewell, and tap water facilities, they also do not have other alternatives; they have been using the water from the polluted pond for a long time. As a result, it leads to various diseases like diarrhea, waterborne disease, skin disease, and other diseases.

And most importantly, it has impacted the food and nutritional status of the people in that village of the KBK region. The importance and use of clean drinking water are very much needed for digesting the food in the body, and it properly helps growth and reproduction. Therefore, the government must provide clean drinking water to the tribal people for food and nutrition security in that particular village.

Photo- 4.5: Undernourished Children in the Majurulendi Village of Malkanagiri District

Source: *Odia Dharitri Newspaper*, 05/05/2017

The above photo talks about the malnourished children in the Majurulendi village of the Malkanagiri district of the KBK region. All the children in the picture are seemingly undernourished due to a lack of adequate quantity and quality of food and clean drinking water, and primary health care benefits. One article of Odia Dharitri Newspaper stated that they do not even avail of any primary health care facilities for various reasons such as long-distance, residing in the hilly terrains. The government schemes like PDS, ICDS, MDMS, MGNREGA, and other welfare schemes have failed in providing any support to the poor tribal people in the village. The main and critical problem for accessing food and nutrition security is the lack of adequate accessibility of food grains and low buying capability, leading to hunger and starvation among the tribal people in that region. Therefore, due to the lack of nutritious food, children are suffering from undernourishment and hunger, and many more problems in that particular village of the district**.** Therefore, the government should provide essential food grains, provision primary healthcare facilities, and provide clean drinking water to the indigenous poor people to improve their food and nutritional status.

4.5.1: Socio-economic and Health Profile of Balangir District in Odisha

The name Balangir has derived from Balaramgarh, and the headquarters is the centre of the district, that is Balangir, and the district formed on 1st November 1949. The east side of the Balangir district is Sonepur district, the west side by Nuapada district, and the south and north side by Kalahandi district. During 1993, the Balangir district has divided into two districts such as Balangir and Sonepur, for smooth administration and developmental works for the entire region in the district. The district is situated in the western part of Odisha. The western and north-western boundary is formed by the vast range of hills known as Gandha Mardan that separates the district from the Sambalpurdistrict and Kalahandi district. It is surrounded in the North by Bargarhdistrict and Subarnapur district, East by Subarnapurdistrict and Boudh district, South by Kalahandi district, and West by Nuapada district. Furthermore, Madhya Pradesh also remains on the western border. The district's total geographical area is 6575 Sq. Km.

Table 4.9: The Total Number of Gram Panchayats and Villages under each CD Block

Sl. No.	Name of CDBlock	No. Gram Panchayats	No. ofVillages
1	Agalpur	18	107
2	Loisinga	18	108
3	Patnagarh	26	164
4	Khaprakhol	18	133
5	Belpara	22	120
6	Turekela	19	104
7	Bangomunda	22	133
8	Muribahal	18	161
9	Titlagarh	22	133
10	Saintala	20	142
11	Deogaon	23	129
12	Balangir	23	125
13	Puintala	24	136
14	Gudvella (Tentulikhunti)	12	94
15	Total	285	1789

Source: Census Data 2011

Table 4.10: The Socioeconomic Status of Balangir District

	Districts	
No. of Villages	Total	1783
	Inhabited	1751
	Uninhabited	32
Number of Households	Normal;	413833
	Institutional	563
	Houseless	353
Total Population	Person	1648997
	Male	830097
	Female	818900
Percent of Urban Population		11.97 (%)
Total Area		6575.00 Sq. Klm
Density of Population		251
Sex Ratio		987 per 1000
Literacy	Person	64.72 (%)
	Male	75.85 (%)
	Female	53.50 (%)
SC and ST Population	Person	38.92 (%)
	Male	38.65 (%)
	Female	39.21 (%)
Total Workers	Person	43.70 (%)
	Male	56.61 (%)
	Female	30.61 (%)
Agricultural Laborer	Person	45.30 (%)
	Male	34.19 (%)
	Female	66.12 (%)
Total Cultivators		23.11 (%)

Source: Census Data, 2011

Map 4.3: Map of the Balangir District

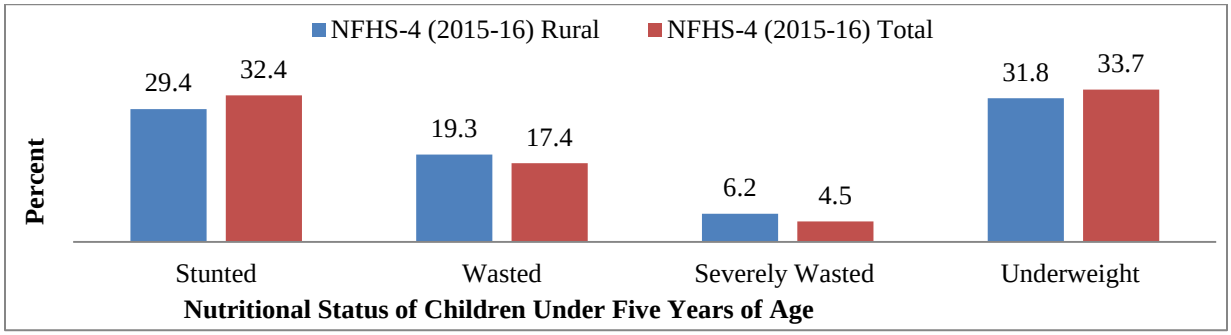
Source: DSHB, 2011

The nutritional and health status among the women is determined by various factors like food intake, socioeconomic factors, and cultural norms and practices in the households. However, the above factors, including the role of forest and different food patterns, also influence the country's nutrition and health status in the case of tribal people. The indigenous communities are categorized by unique traditions, primitive traits, meager socioeconomic status, and distinctive culture in the society. Santhosam et al. (2013) mentioned that the health of the tribal communities remains substandard even after 73 years of independence even though those communities as conferred special status under the Fifth/Sixth Schedule of the Indian Constitution. The study found that nutrition and health standard among the primitive tribal communities is very low compared to tribal communities in Odisha. Balgir (2004) studied the socioeconomic condition of tribal communities and discovered that those communities suffer from malnutrition, hunger, starvation death due to lack of adequate and quality food grains, including other essential items, lack of basic health facilities, high mortality, morbidity, and most importantly neglected by the government and exploited by upper caste people in the society.

He also mentioned that the majority are living below the poverty line, lack of basic health care facilities, no sanitation facilities, no clean drinking water facilities, high illiteracy, hostile

environment, blind beliefs, lack of awareness are the major factors influencing the food and nutritional status of the tribal communities. Furthermore, those communities get affected by other diseases like diarrhea, malaria, measles, skin diseases, and gastroenteritis. The health status of an individual is directly related to their socioeconomic situation. Given that a healthy person has a higher capacity to work, the former also directly bear the latter. The goal of economic activity is human well-being, an important, even elementary component of which is health.

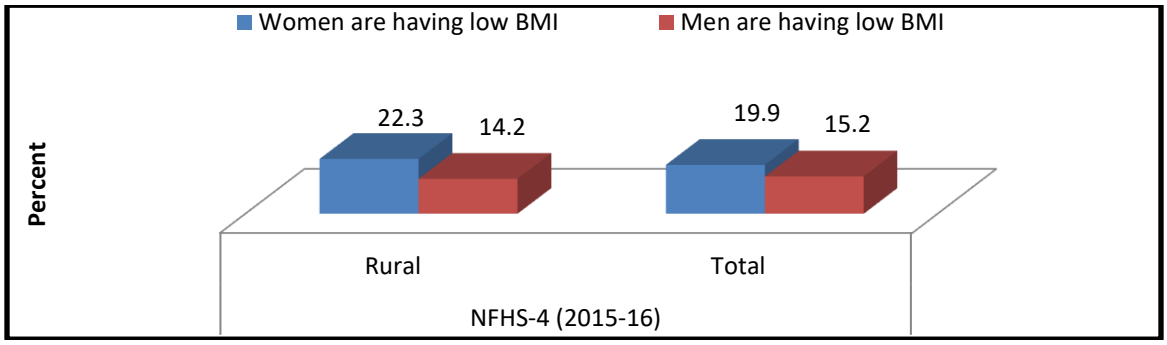
Figure 4.1: The Nutritional Status of Children in Balangir District



Source: Author's Estimation from NFHS-IV, and IIPS-2015-16

The above figure tells about the nutritional status of children in the Balangir district of KBK Region in 2015-16. The blue bar represents the rural area, and the red bar represents the whole district. It tells that the underweight is high, followed by stunted children, wasted and severely wasted both in rural and across the entire district according to the NFHS-IV. It shows 29.4 percent of stunted children followed by 19.3 percent wasted, 6.2 severely wasted, and 31.8 percent of children are underweight in the rural area. Whereas in the case of the whole district, there are minor differences in the figures; 32.4 percent stunted, 17.4 percent wasted, 4.5 percent severely wasted, and 33.7 percent underweight in the whole district. The overall figure describes a severe percentage of malnutrition and under-nutrition among the children due to lack of nutritious food, lack of purchasing power, and basic health care facilities in the district compared to the state.

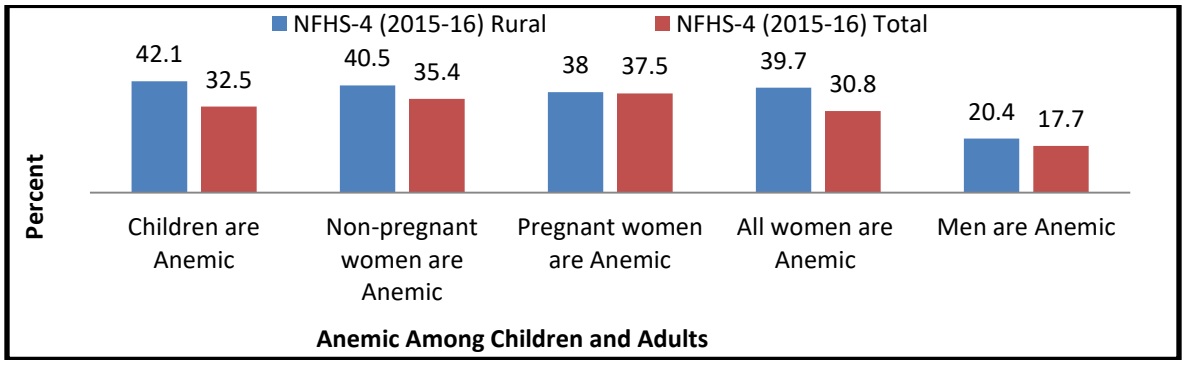
Figure 4.2: The Nutritional Status of Adults in Balangir District



Source: Author's Calculation from NFHS-IV, and IIPS-2015-16

The above figure tells about the nutritional status of adults in the Balangir district according to the NFHS-IV Report. The Blue Bar represents the rural area, whereas the red line represents the whole district. It shows that the malnutrition and undernutrition among the women are high both due to various factors like lack of awareness, no sanitation facilities, and no health care amenities apart from the quantity and quality of food grains in rural and the entire district. Regarding the overweight, the men outshine the women in the whole district in the same period. That means men have a better BMI compared to women in the district.

Figure 4.3: The Nutritional Status of Children and Adults in Balangir District



Source: Author's Calculation from NFHS-IV, and IIPS-2015-16

Figure 4.3 explains the nutritional status of the adults (15-49 years) and children less than five years of age in a rural area and the whole Balangir district in 2015-16. It tells that 22.3 percent of women and 14.2 percent of men have low BMI in the rural area, whereas 19.9 percent of women and 15.2 percent of men have low BMI in the whole district. The second part of the table tells that 51.5 percent of children are anemic, followed by 40.5 percent non-pregnant

women, 38 percent pregnant women, 39.7 percent all women. Finally, 20.4 percent of men are anemic in rural areas. The above figure explains that women and children suffer more from anemia due to a lack of basic health care facilities and nutritious food.

4.7: The Health and Socio-Economic Profile of Rayagada District

The district of Rayagada was made out of the undivided Koraput district of Odisha on 2nd October 1992. The Rayagada is derived from the word "Raya," which indicates the rock, and "Gada" means the deep holes in the rock according to the opinion of the local people. It is surrounded by Kalahandi and Nawarangpur districts by the west side, followed by Gajapati by the east side, in the south Koraput district and Srikakulam district of Andhra Pradesh, and in the north Kandhamal district. This district is one among the KBK Region in the state. This is a tribal-dominated district, where more than 60 percent of people are tribal.

Table-4.11: The Total Number of Gram Panchayats and Villages under each CD Blocks

Sl. No.	Name of the CD Block	Number of Gram Panchayats	No. of Villages
1.	Muniguda	16	416
2.	Chandrapur	7	219
3.	Gudari	9	159
4.	Bishamakatak	20	308
5.	Kalyansingpur	13	254
6.	**Kashipur**	**20**	**449**
7.	Rayagada	28	294
8.	Kolnara	15	199
9.	Ramanaguda	12	119
10.	Padmapur	13	125
11.	Gunupur	18	129
	Total	**171**	**2671**

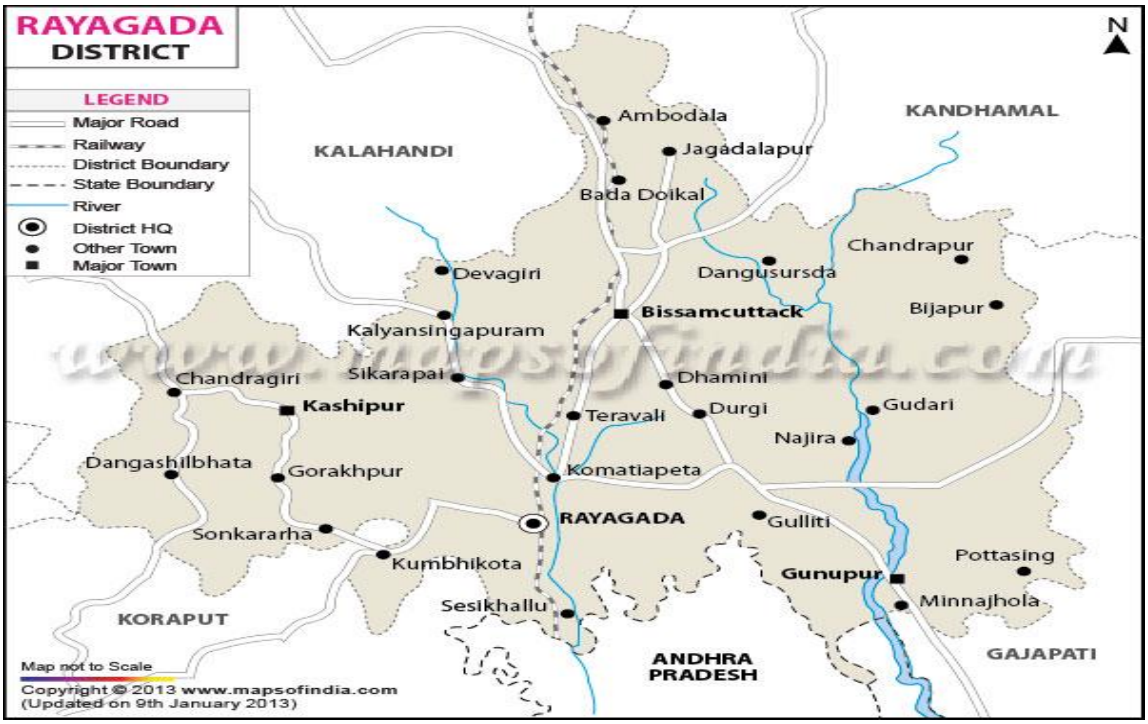
Source: Census Data, 2011

Table 4.12: Socioeconomic Status of Rayagada District

	Districts	
No. of Villages	Total	2,665
	Inhabited	2468
	Uninhabited	197
Number of Households	Normal;	224174
	Institutional	799
	Houseless	171
Total Population	Person	967922
	Male	471960
	Female	495951
Percent of Urban Population		15.18 (%)
Total Area (In Sq. klm.)		7073
Density of Population (Per Square klm.)		137
Sex Ratio		1051 Per 1000 Males
Literacy	Person	49.76 (%)
	Male	61.04 (%)
	Female	39.19 (%)
SC and ST Population- Proportion of Total Population	Person	70.4 (%)
	Male	69.31 (%)
	Female	71.44 (%)
Total Workers	Person	48.26 (%)
	Male	54.67 (%)
	Female	42.16 (%)
Agricultural Laborer	Person	53.13 (%)
	Male	39.23 (%)
	Female	70.28 (%)
Total Cultivators		21.25 (%)

Source: Census Data, 2011

Map 4.4: Map of the Rayagada District

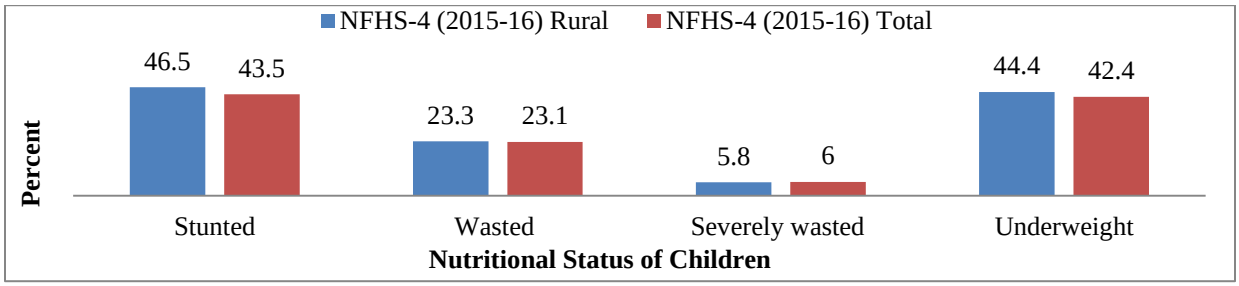


Source: DSHB, 2011

There are various factors like mortality rate, fertility rate, food intake, living style, life expectancy, and other factors that determine the health status of the people in any society. The different essential indicators like beliefs, poverty, clean drinking water, basic healthcare facilities, work status, level of household income, sanitation, social-economic infrastructure, nutrition, and many other factors influence the individual's health status in the society. Sharma (2012) found out the positive and direct relationship between development and health in society. The health status of any community varies from one to another. However, factors like the high level of illiteracy, traditional occupation, high level of poverty, living as heterogeneous groups, geographical and cultural isolation, and lack of awareness put them in the lowest strata of society. Economic growth and development mainly depend on the health and nutritional status of the people in any country. The economic growth and development of any nation can be influenced positively and negatively by the health status of a given population. The various studies and reviews revealed countries like England and France where better health status has contributed abundantly to their economic progress and development.

While Das (2012) found out that Africa's poor economic growth and development are hindered by poor health and nutritional status, and India is no exception from that where, due to regional disparities among the different states and urban-rural divide, growth and development are hindered severely. There are crucial and essential factors like livelihood insecurity, vulnerability, exposure to health risk and high poverty, and many more factors significantly influence the people's food security in Odisha. Therefore, the state needs to speed up various developmental works and focus on eradicating severe hunger and under nutrition among the poor people in general and tribal people in particular so that the standard of living of those sections will increase. Low-income levels, starvation, under nutrition, and hunger made it really difficult for poor people to raise their living standards and made it so challenging for those groups to contribute to the sustainable growth and development of the state.

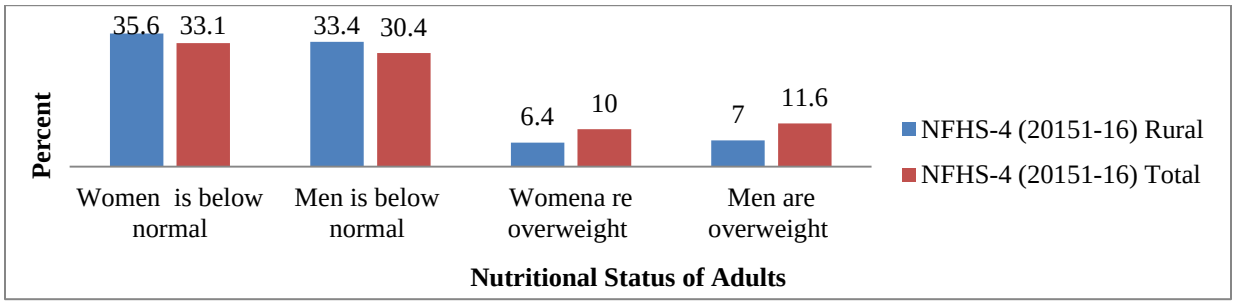
Figure-4.4: The Nutritional Status of Children in Rayagada District



Source: Author's Calculation from NFHS-IV, and IIPS-2015-16

Figure 4.4 describes the nutritional status of children in the district based on NFHS-4. It shows 46.5 percent of stunted children followed by 23.3 percent wasted, 5.8 severely wasted, and 44.4 percent of children are underweight in the rural area. Whereas in the case of the whole district, there is a minor difference in the figure; 43.5 percent stunted, 23.1 percent wasted, 6 percent severely wasted, and 42.4 percent underweight in the whole district. The overall picture tells that the percentage of malnutrition and under-nutrition among the children and malnutrition is more in a rural area than the total in the district. Factors like lack of access to primary health care facilities, lack of awareness, lack of affordability are responsible for high under-nutrition and malnutrition in the district.

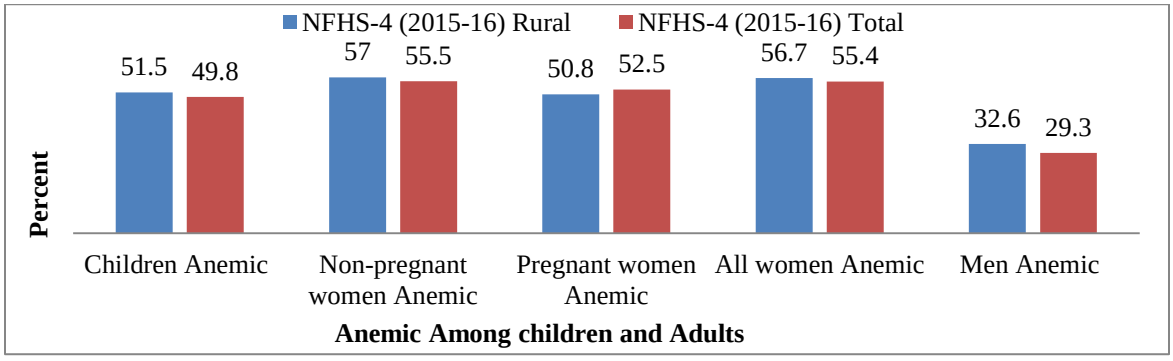
Figure 4.5: The Nutritional Status of Adults in Rayagada District



Source: Author's Calculation from NFHS-IV, and IIPS-2015-16

Figure 4.5 describes the adult's nutritional status and adults in the Rayagada district according to NFHS-IV Report. It tells that 35.6 percent of women have low BMI in the rural area whereas 33.1 percent in the whole district likewise for men 33.4 percent have low BMI while it is 30.4 percent in the entire district. Figure 4.6 shows that 51.5 percent of children are anaemic in a rural area while 49.8 percent for the whole district. Furthermore, 57 percent of non-pregnant women are anaemic, followed by 50.8 percent pregnant women, 56.7 percent all women, and 32.6 percent men are anaemic in rural areas. In the case of the whole district, it shows that there is 55.5 percent non-pregnant is anaemic, 52.5 percent are pregnant, 55.4 percent are all women, and 29.3 percent men were anaemic in 2015-16. Regarding the overweight, the men outshine the women in the whole district in the same period. The whole analysis of tribal people's poor nutritional status indicates the district's backwardness and underdevelopment in the KBK region**.**

Figure 4.6: The Nutritional Status of Children and Adults in Rayagada District



Source: Author's Calculation from NFHS-IV, and IIPS-2015-16

The above figure describes the anaemic status of children and adults in the rural area and the whole district in 2015-16. The blue bar represents the rural area, whereas the red bar represents the entire district. It shows that the anaemic among the non-pregnant women is the highest, followed by all women, pregnant women, and children. On the other hand, the anaemia among the men is very low compared to all women and children in the whole district, according to NFHS-IV. For example, Figure 4.6 shows 49.8 percent of children anaemic followed by 55.5 percent anaemic non-pregnant women, 52.5 percent anaemic pregnant women, 29.3 percent men are anaemic according to NFHS-IV. On the whole, factors like lack of sufficient micro-nutrient foods, lack of ACWs, ignorance, and superstition among the tribal people, non-existence of primary health care facilities, and lack of purchasing power are responsible for low food nutritional status among the poor tribal people in the district.

The below two photos tell about the undernutrition among the children and women in the Kashipur block of Rayagada district. The undernutrition among the children and adults speaks about the district's poor and low health status. The first photo shows a health worker administering polio to an under nourished child in the same block, while the second photo shows that the undernourished mother is holding her malnourished child at her home. The undernutrition among children and women is due to poor health and lack of adequate nutritious food. The various studies mentioned that lack of sufficient and quality of food grains, lack of purchasing power, and lack of health care facilities resulted in the under-nutrition among them.

Photo 4.6: Undernourished Children and Women in the Rayagada District

Source: *Dharitri Odia Newspaper*, 26/07/2016

4.7.1: Kashipur Block of Rayagada District

The poor socioeconomic indicators tell the underdevelopment and backwardness in the district. The literacy rate is very low amongst the people and worst among the tribal people. There is only a 49.46 percent literacy rate (consisting of 35.65 percent female literacy and 56.45 percent male literacy) in the whole district compared to 72 percent in the state (DSHB, 2015-16). There are various reports of starvation death in the recent past of the block due to shortage of foodand lack of access to land, and failure of government schemes to reach out to the poorest of the poor tribal people on the other side. The issue, however, has brought into focus the back-breaking poverty of the region's hapless tribal in different parts of the block, and the fact that there has been little improvement in their condition despite the implementation of a plethora of welfare schemes by successive governments and voluntary organizations over the period. For instance, the recent survey tells a very heartbreaking story of the two villages, which reveals that people are still unable to fulfill one square meal a day, let alone forget about other basic amenities even after the

73 years of independence. On the other side, people lack basic education, basic primary health care, lack of road and communication, and finally, lack of welfare schemes for the poor tribal people. The other side of the story reveals that the forest rights of the tribal people are taken away by the government through many restrictions and regulations in that area. It has resulted in a decline in the food, forest products, and wood for houses and firewood for them (Indian Express, 2016).

There are eight-gram panchayats under the Kashipur block of Rayagada district in Odisha. Moreover, all the eight-gram panchayats are underdeveloped and backward. The study has selected two-gram panchayats such as Gudibali and Hadiguda based on the various indicators, which have been explained in the first chapter of the thesis. The Gudibali panchayat is the most backward gram panchayat in the entire block where the problem of undernutrition, hunger, and starvation deaths exists in the panchayat (Dharitri, July 2017). It is a tribal-dominated panchayat, where more than 90 percent of people are tribal; the majority is *JhodiaKandha* and Damba, apart from other tribal groups (DSHB, 2016). There is no proper transport and communication, no medical facilities at all, a lack of sufficient schools, and a lack of adequate AWCs in the various parts of the block. The various government schemes like PDS, MGNREGA, MDMS, ICDS and other social welfare schemes do not reach them. The Hadiguda gram panchayat is another most backward panchayat in the block of the district. It is an entirely tribal-dominated panchayat where more than 94 percent people are tribal of the total population. They dwell in the footpath of the mountain, and access to basic essentials is a distant dream for them.

The below photos talk about the poor tribal households eating mango kernels during the rainy season due to a shortage of foods in the Sipijodi village of Kashipur area in the KBK of the state. The left side photo speaks about the mango kernel drying the sun for future consumption due to unavailability of food grains in their households. On the right side, the photo shows a woman cleaning the dried mango kernel for consumption due to a lack of food grains in July. Furthermore, they face severe food shortages not only in the rainy season but also in the summer season too. Therefore, due to a shortage of food grains, they store the mango kernel during the summer and use it as the rainy season's staple food. For instance, they recount the 2000 incidence, where 19 poor tribal people had died eating poisonous mango kernel in the same

block. On the other side, lack of government-sponsored schemes and curtailment of forest rights are other factors responsible for low food security status among the poor tribal people.

Photo-4.7: Consumption of *AmbaKoili* or Mango Seeds/Mango Kernel during the Rainy Season in Kashipur Block of Rayagada District

Source: *Dharitri Odia Newspaper*, 04/08/2017

4.8: The Comparative Study between Balangir and Rayagada District

The present study tried to examine the different development indicators for making the comparative study of the two districts in the KBK region of Odisha. The study found that Balangir district is developed, whereas Rayagada district is backward based on the socioeconomic indicators mentioned in the secondary data analysis. Moreover, the two districts have a different distinct nature of geography, location, and others. Table 4.14 also highlights the significant and vital differences between the two districts of the KBK region.

Table 4.13: The Comparative Study of the Two Districts in the KBK Region

Important Indicators	Balangir District	Rayagada District
Percent of Literacy	64.72	49.76
Percent of Female Literacy	35.8	18.3
Percent of BPL	61.06	72.03
Percent of Backward Blocks	35,71	81.82
Percent of ST Population	38.92	70.4
Percent of Child Mortality	157	156
Percent of Anemic Children	39.8	47.2
Percent of Agricultural Laborer	43.3	49.9
Value of Human Development Index	0.546	0.433
Percent of Stunted Children	32.4	43.5
Percent of Wasted Children	17.4	23.1
Percent of Underweight Children	33.7	42.2
Percent Access to Safe Drinking Water	48.6	23.9
Percent Access to PHCs	24.3	15,9
Percent Access to Toilet	9.3	4.2
Value of Absorption Index	0.519	0.343

Sources: Authors Calculation from IIPS-2016, Odisha Economic Survey-2018, and DSHB-2017-18

4.7: The Overall Food and Nutritional Status of Odisha

Although India has accomplished food self-sufficiency at the macro level, but the majority of people are still affected by high levels of undernutrition, low birth weight, and nutritional deficiencies such as vitamin A deficiency, minerals, and anaemia at the micro-level. However, the majority among them are children and women who suffer from the undernutrition category throughout the country. Odisha is one among them where under-nutrition among young children and women is highest paralleled to other states in our country and particularly among the tribal people in the state. Panda (2014) found that half of the total children are underweight in the state. He further added that the undernutrition and hunger of the poor tribal people transferred from one generation to another generation in the KBK region of Odisha. The food and nutrition is worst in the KBK region because of an inter-generation cycle of undernutrition of women and girls affecting the food and nutritional security of future generations in the tribal belt of the state. The study found that factors like lack of safe drinking water, lack of toilet facilities, and lack of necessary healthcare facilities are responsible for poor and low nutritional status among those groups. On the whole, the micro-nutrients deficiencies are the result of poor food utilization.

They are mostly attributable to inadequate intake and absorption of essential vitamins and minerals essential for healthy growth and development in the whole state.

4.8: Conclusion

To conclude, food habits, food intake, food practices, socio factors, economic factors, beliefs, and cultural traditions and norms influence the food security status of the people at the household level in the society. However, there is high food and nutrition insecurity among the people in Odisha due to the problem with policy design and implementation. As a result of this, millions of people suffer from undernutrition and hunger in the state. Apart from that, there are factors like the low-income level of the people, lack of adequate nutrient diet, lack of necessary healthcare facilities, and lack of safe drinking water facilities resulting in poor and low status of food and nutrition among the people in the different parts of the state. The nutritional and health status figure is worse in the KBK Region than in South African countries. The western parts of the state are most underdeveloped and backward due to various reasons. The tribal people, in particular, lack the necessary facilities and the right to live in the state. The state government needs to redesign the policies and strategies for tackling and reducing the malnutrition and hunger among the people and need to raise the overall standard of living of the people, particularly the poor and deprived section of the state. The government should initiate various multi-pronged policies and programs to eradicate the malnutrition problem among the poor tribal people, as the tribal people are the most disadvantaged and deprived sections in the state. The next chapter talks about the demographic profile, economic status, social status, consumption pattern, food intake, poverty, health status, food insecurity status, nutrition insecurity, sanitation, drinking water of all three villages of two districts in the KBK region.

Chapter - V
Food and Nutritional Security at Household Level: Micro Analysis of Selected Villages

5.1: Introduction

A healthy person needs sufficient and appropriate nutrition for his/her growth and development in order to live an active life in the society. Hence, it requires a wide variety of important vitamins and nutrients that perform various functions in the body. There are various micronutrients such as protein, vitamins, fat, energy, carbohydrate, and minerals which are vital in leading a healthy life (Arlapa et al., 2010). The quantity and quality of food mainly determines the nutritional intake of the people. However, large segments of the total population of India are remaining beyond sufficient access to food (Deaton and Dreze, 2009). The Indian food and consumption pattern primarily consists of vegetable-based food such as rice, pulses, roots, tubers, legumes, cereals, green leafy and non-leafy vegetables, etc. (Ahmed 1998). Majority of Indian population lies within the rural composition in the Indian sub-continent. And all these foods are an essential part of the rural consumption, as it provides important nutrients in the food and nutrition security status of the people in the country (Sanjit Sarkar, 2017).

It is evident from the studies that, there is a gross deficiency of various micronutrients like iron, folic acid, riboflavin and vitamin A in the quality of Indian food which has led to the widespread of micronutrients malnutrition among poor people throughout the country (Sanjit Sarkar, 2017). However, India loses the economic cost of 0.8 to 2.4 percent of the total GDP due to micro-nutrient malnutrition (Toteja et al., 2006). There are poor children, tribal people, girls' child, adolescents, nursing mothers and expectant mothers who are more vulnerable and suffer from the nutritional deficiency. The importance and value of adequate nutrition in early childhood is crucial for their all-round growth and development (Sahil, 1996). The study explains about the socio-economic condition and also the food and nutritional status of household members, in three sample villages of two districts in the KBK Region of Odisha.

5.2: Socio-economic Condition of Three Sample Villages in the KBK Region

The tribal people in this region popularly named as *Vanavasi* (inhabitants of the forest), *Vanajati* (castes of the forest), *Janjati* (folk people), *Adimjati* (primitive people), *Anusuchit Janjati* (Scheduled Tribe). Moreover, they dwell in the dense forests, hills, mountains, jungle, and primarily remote areas of the country. Tribal people have indigenous culture, living style, tradition, vernacular dialect, and food habits, (Sanjit Sarkar, 2017). However, in the conventional *Varna vyavastha* (caste system), our society is divided into four groups based on different professions (Sanjit Sarakar, 2017). However, there are other two important groups or communities such as scheduled caste (SCs) and scheduled tribe (STs) in the contemporary Indian societal structure (Kapputhai and Mallika, 2010). And now-a-days, both communities are facing a wide range of issues and problems than other communities. However, most importantly, these communities are backward, politically and socially ignorant, geographically inaccessible, economically very deprived, politically apathetic, traditionally and customarily rich, and living their lives in the remote and forest areas of the districts. In the context of food and nutritional security status, factors like less availability of food grains and proper functioning of various safety net programmes are the main factors responsible for poor nutritional status of these communities in the two districts of KBK Region. And also other important factors like poor quality of food intake, lack of awareness, lack of hygiene and lack of literacy among those communities are responsible for low food and nutritional status in those villages (Mittal and Srivastava, 2006). The study has already mentioned in the selection of two districts and blocks in the KBK Region in the methodology part. Moreover, the study selected One Village (Babjore village) in Balangir district and two villages (Bhitarapadamajhi village and Tikarpadar village) in Rayagada district through simple random and purposive sampling. Moreover, it has taken a comparative study of three villages of the two districts in the KBK Region of Odisha.

This chapter discusses both the socio-economic conditions, and food and nutrition security status of both tribal and non-tribal resident of Babjore village in Balangir district, and Bhitarapadamajhi and Tikarpadar village of Rayagada district in KBK Region. The information is collected through primary household survey with the structured questionnaire using interview schedule method. The study has done the complete case of study of three villages of two districts. In order to understand the socio-economic condition, and food and nutrition security status of different social groups, the information about number of person in households, their

educational and occupational status, landholding status, income and saving status, wage status, major crops, production and its cost, consumption status, types of households, targeting errors, number of undernourished persons, drinking water facilities, structure of houses have been collected from 98 households in Balangir district and 150 households in Rayagada district respectively is analyzed accordingly.

Table- 5.1: Family Size of the Households in the Sample Villages of Two Districts

Family Size (in Numbers)	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi Village	Tikarpadar Village	Total
1-3	57 (58.16)	53 (66.25)	48 (68.58)	101 (67.34)
3-6	32 (32.65)	20 (25)	19 (27.15)	39 (26)
6-9	6 (6.12)	5 ((6.25)	2 (2.85)	7 (4.66)
9 & above	3 (3.07)	2 (2.5)	1 (1.42)	3 (2)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate percent in the Total Households

The above table 5.1 tells about the family size of the three villages in two districts. Moreover, to understand the family size of the tribal and non-tribal households in the sample villages, the number of person living in each household is collected and classified into four types. From the results, 58.16 percent households have the small size family and 3.07 percent households have extra-large size family in the Babjore village of Balangir district. Whereas in the case of Rayagada district the results are bit different, as it shows that maximum 66.25 and 68.58 percent households are having small size family and a very small proportion of households are having large family respectively in Bhitarapadamajhi and Tikarpadar villages. Now a day's people prefer to live in small and nuclear family due to changing culture and tradition and for more convenience. The overall broad figures of all three villages tell that every household wants a small family for better and happy living.

Table-5.2: Head of the Households in the Sample Villages of Two Districts

Households Headed by	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi	Tikarpadar	Total
Male	71 (72.44)	48 (60)	45 (64.28)	125 (83.33)
Female	27 (27.56)	32 (40)	25 (35.72)	25 (16.67)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017

Note: The figures in the brackets indicate percent in the Total Households

The head of the household plays an essential role in decision making in households. The above table 5.2 describes the head of the households in the studied villages of the two districts. The maximum 72.44 percent of households are headed and dominated by male members in the Babjore village of Balangir district. It is different in the other two villages of Balangir districts where maximum 60 percent and 64.28 percent households are dominated by male members respectively in Bhitarapadamajhi village and Tikarpadar village of Rayagada district. The tribal societies are having less dominated by male members and less discriminated in comparison to other social groups in society. The overall results of the three villages show that tribal households are less dominated in Rayagada district in comparison to other social groups in the Balangir district of the KBK Region.

Table- 5.3: Socio-religious Status of the Households in the Sample Villages of two Districts

Type of Family	**Balangir District**	**Rayagada District**		
	Babjore Village	**Bhitarapadamajhi**	**Tikarpadar**	**Total**
Nuclear	88 (89.8)	72 (90)	66 (94.28)	138 (92)
Joint	10 (10.2)	8 (10)	4 (5.72)	12 (8)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**
The Religion of the Households				
Hindu	79 (80.62)	60 (75)	65 (92.85)	125 (83.34)
Christian	19 (19.38)	20 (25)	5 (7.15)	25 (16.66)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**
Caste of the Households				
ST	21 (21.42)	78 (97.5)	16 (22.85)	94 (62.66)
SC	62 (63.26)	2 (2.5)	54 (77.15)	56 (37.34)
OBC	9 (9.18)	-	-	-
General	6 (6.12)	-	-	-
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**
Population Compositions				
Populations	**Balangir District**	**Rayagada District**		
	Babjore Village	**Bhitarapadamajhi**	**Tikarpadar**	**Total**
Male	78 (21.92)	70 (20.58)	48 (18.6)	118 (19.74)
Female	67 (18.82)	75 (22.06)	56 (21.7)	131 (21.9)
Boys	113 (31.75)	90 (26.48)	76 (29.46)	166 (27.76)
Girls	98 (27.52)	105 (30.88)	78 (30.24)	183 (30.6)
Total	**356 (100)**	**340 (100)**	**258 (100)**	**598 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Households

Table 5.3 explains the socio-religious status of the three villages of the two districts. It shows that 90 percent households have nuclear status in all three villages due to factors like the inconvenience of managing households and family dispute that led to smaller size among the households. About the religion part, the majority households are Hindus (above 80 percent) in all three villages of the two districts and few households are Christians in other two villages of Rayagada district due to conversion from Hinduism to Christianism. The caste composition of the three sample villages gives very contradictory figures, where SCs dominate (63.63 per \cent) in Babjore village of Balangir district while the percentage is above 77 percent in Tikarpadar village of Rayagada district. Moreover, the Bhitarapadamajhi village has more families belonging to the Scheduled Tribe (97.5 percent) and a few SC households. There are no other castes in the two villages of Rayagada district. The population composition of all three villages depicts a fascinating scenario, where the male ratio, including boys (about 54 percent) is more compared to female ratio in Babjore village of Balangir district. However, it is opposite in the other two villages of Rayagada district. As it shows, the percent of females including girl child (over 52 percent) is more than the male ratio in both these villages due to a greater preference of girl child in the tribal societies.

Table- 5.4: Sex-wise Educational Status of the Household Members in the Sample Villages of Two Districts

Babjore Village	**Gender**	**Sex-wise Education- Balangir District**					**Total**
		Illiterate	**Primary**	**Below Matric**	**Intermediate**	**Graduation**	
	Male	50 (24.88)	81 (40.3)	38 (18.9)	20 (9.95)	12 (5.98)	201 (56.46)
	Female	82 (52.9)	46 (29.68)	20 (12.9)	5 (3.22)	2 (1.3)	155 (43.54)
	Total	**132 (37.07)**	**127 (35.68)**	**58 (16.3)**	**25 (7.02)**	**14 (3.94)**	**356 (100)**
Sex-wise Education -Rayagada District							
Bhitarapadamajhi Village	**Gender**	**Illiterate**	**Primary**	**Below Matric**	**Intermediate**	**Graduation**	**Total**
	Male	59 (36.88)	92 (57.5)	7 (4.38)	2 (1.25)	-	160 (52.35)
	Female	122 (67.78)	55 (30.56)	2 (1.12)	1 (0.56)	-	180 (47.65)
	Total	**181 (53.24)**	**147 (43.24)**	**9 (2.65)**	**3 (0.88)**		**340 (100)**
Tikarpadar Village	Male	55 (48.25)	53 (46.5)	5 (4.38)	1 (0.88)	-	114 (44.18)
	Female	113 (78.48)	30 (20.84)	1 (0.7)	-	-	144 (55.82)
	Total	**168 (65.11)**	**83 (32.18)**	**6 (2.31)**	**1 (0.37)**	**-**	**258 (100)**
Grand Total		**347 (58.02)**	**230 (38.46)**	**17 (2.84)**	**4 (0.66)**	**-**	**598 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: Figures in the brackets indicates the percent of the Total Population

The development of any nation is dependent on the quality of education. And the quality of education is the most important pre-condition for the overall progress and also improvement of any human being in the society. Therefore, education plays an essential role in humans' life, and it usually leads to a better job, higher income and improved social status. Therefore, to understand the educational status of tribal and non-tribal people in the surveyed villages, the information about the level of education has been collected. Table 5.4 explains the deplorable educational status of the population in the three villages of two districts. The above table gives the information that 37.07 percent people are illiterate in Babjore village of Balangir district. Nevertheless, male literacy is higher than the female literacy rate. On the other hand, the two villages (Bhitarapadamajhi and Tikarpadar) of Rayagada district show a very gloomy picture; educational backwardness among the tribal people is high, even after 73 years of independence. 54 percent of the population in Bhitarapadamajhi is illiterate and the figure is 65 percent in case of the Tikarpadar village. Furthermore, female literacy is low, 32 percent in Bhitarapadamajhi and 21 percent in Tikarpadar village of Rayagada district of KBK Region. Furthermore, no one has been able to go to college in both those villages due to lack of ignorance, awareness, superstition beliefs and government apathy towards those sections. The overall picture of all three villages tells that Babjore village of Balangir district has a better literacy rate whereas both the tribal villages of Rayagada district have a very low percentage of literacy due to various factors mentioned above.

Table-5.5: Caste-wise Land Holding Status of the Households in the Sample Village of Balangir District

	Different Social Groups- Babjore Village				
Land Holdings Size	**SC**	**ST**	**OBC**	**General**	**Total (Aggregate)**
Less than One Acres	21 (33.8)	5 (23.8)	3(33.34)	1 (16.67)	30 (30.61)
1-2 Acres	5 (8.06)	4 (19.04)	2 (22.24)	2 (33.34)	13 (13.26)
2-3 Acres	4 (6.46)	2 (9.52)	3 (33.34)	1 (16.67)	9 (9.18)
Above 3 Acres	6 (9.68)	1 (4.77)	1 (11.12)	2 (33.34)	11 (11.23)
Landless	26 (41.94)	9 (42.85)	-	-	35 (35.72)
Total H.Hs	**62 (63.26)**	**21(21.43)**	**9 (9.18)**	**6 (6.22)**	**98**

Source: Author's Calculation from Filed Survey, January- February 2017
Note- The figures are in percent of Total Households

Typically, land is the fundamental means of production in an agrarian society without which no agricultural production can take place. Therefore, an understanding of the pattern of ownership and operational holdings of land is of the central importance to the understanding of the agrarian class structure in the society (Rawal, 2008). The sizes of the landholdings indicate the wealth and social status of households in any society. The figures in table 5.5 describe the landholding compositions of the households among the various social groups like SC, STs, Other Backward Caste (OBC) and general castes in the Babjore village of Balangir district. The figures describe that there are more marginal and small landholders followed by medium and large farmers in the sample village of Balangir district. The majority of households owning less than one acre of land (33.8 percent) belongs to the SC households followed by OBC, ST and general castes. Amongst the landless, the maximum population belongs to the ST households (42.85 percent), followed by SC households (41.94 percent). No household belonging to the OBC and general castes was found to be landless. 35.72 percent households, belonging to the various social groups are landless, and the field report shows that the landlessness is higher among the marginal sections like SCs and STs in comparison to the other castes in that district. The overall pictures of access to land is better in Balangir district due to availability of plain area whereas the land status of tribal people in the other two villages is very low due to hilly terrain of Rayagada district.

Table-5.6: Caste-wise Land Holding Status of the Households in the Sample Villages of Rayagada District

	Different Social Groups						
	Bhitarapadamajhi Village			**Tikarpadar Village**			
Land Holding Size	**SC**	**ST**	**Total**	**SC**	**ST**	**Total**	**Grand Total**
Less than 1 Acres	1 (50)	26 (33.34)	27 (33.75)	6 (11.12)	3 (18.75)	9 (12.85)	36 (24)
1-2 Acres	1(50)	5 (6.41)	6 (7.5)	4 (7.4)	2 (12.5)	6 (8.58)	12 (8)
2-3 Acres	-	2 (2.56)	2 (2.5)	2 (3.7)	1 (6.25)	3 (4.28)	5 (3.34)
Above 3 Acres	-	1 (1.28)	1 (1.25)	1(1.86)	-	1 (1.42)	2 (1.34)
Landless	-	44 (55.13)	44 (55)	41(75.92)	10 (62.5)	51 (72.86)	95 (63.34)
Total H.Hs	**2 (2.5)**	**78 (97.5)**	**80**	**54 (77.14)**	**16 (22.86)**	**70**	**150**

Source: Author's Calculation from Filed Survey, January- February 2017

Note- The figures are in percent of Total Households

It is obviously true that the ownership of land has important implications for the economic well-being and social condition of the rural households in particular for the underprivileged sections of the society (Rawal, 2008). The caste-wise land holding status among the various social groups are explained in the above table-5.6. It describes about the low holding and landless status among the tribal households (only two communities like SC and ST live) in the two villages of Rayagada district. In Bhitarapadamajhi, it can be seen that only two households belong to the SC category where one household owns less than one acre and the other holds 1-2 acres of land. The majority of households owning less than one acre land belong to the ST community (33.34 percent). In the case of 1-2 acres of land, 6.41 percent households belong to the ST community. 55.13 percent households of the ST community are landless in the Bhitarapadamajhi village. The land holding status among the SC and ST is poor due to low availability of land in their area. In Tikarpadar, 11.12 percent SC households and 18.75 percent ST households own less than one acre of land. A higher percentage of landless are found among the SC (75.92 percent) than the ST households (62.5 percent). The land status among both SC and ST households is better in Bhitarapadamajhi village in comparison to Tikarpadar village of Rayagada district in KBK Region. Hilly and rocky terrain, mountainous regions are the main reasons for the low land status among these two communities in the district. The overall land status tells about the pathetic socio-economic condition among the tribal communities in the Rayagada district.

Table- 5.7: Types of Land of the Households in the Sample Villages of Two Districts

Types of Land	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi	Tikarpadar	Total
Irrigated	2 (2.04)	-	-	-
Non-irrigated	38 (38.37)	15 (18.75)	11(15.72)	26 (17.34)
Barren	15 (15.3)	7 (8.75)	3 (4.28)	10 (6.67)
Fallow	8 (8.15)	14 (17.5)	5 (7.15)	19 (12.66)
Landless	35 (35.71)	44 (55)	51 (72.85)	95 (63.33)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January and February 2017
Note: The figures in the brackets indicate the percent of the Total Households

The types of land belonging to the households determine the production and income status of the household in the society. It is a very important source of livelihood for the majority of people in the rural areas of the country. That means more irrigated and fertile land gives better production and income to the farmers. The above table 5.7 depicts that in the Babjore village of Balangir district, only 2.04 percent households own irrigated land resulting in better production and income of the farmers, which means maximum farmers depend upon rainfall for their cultivation and 35.71 percent households do not have any land. Amongst the landless, most families belong to the ST community in Balangir district. On the other hand, the two villages Bhitarapadamajhi and Tikarpadar show a more pitiable scenario in the case of land distribution. In the Rayagada district, there is absence of any form of irrigation facility and people mostly depend on rainfall for their cultivation. The tribal households have low access to land leading to lower production of food grains, which are insufficient for them throughout the year. This leads to hunger, under nutrition and food insecurity amongst the population. The table shows that 55 percent households in Bhitarapadamajhi and 72.85 percent families in Tikarpadar are landless. There is a lack of irrigation facilities in all three villages of the two districts in the KBK Region.

Table- 5.8: Caste and Sex-wise Occupational Structure of the Households in Babjore Village

Occupational Structure	SC			ST			Other Castes			Grand Total		
	Male	Female	Total	Male	Female	Total	Male	Female	Total	Male	Female	Total
Agri. Cultivators	13 (19.4)	10 (20.4)	23(19.83)	5 (13.52)	4 (16)	9 (14.52)	13(48.14)	10(55.56)	23(51.12)	31(23.67)	24(26.08)	55 (24.66)
Agri. Labourer	16 (23.89)	12 (24.48)	28(24.14)	8 (21.62)	6 (24)	14(22.6)	4 (14.81)	3 (16.67)	7(15.56)	28(21.38)	21(22.82)	49 (21.98)
Wage Labourer	27 (40.3)	20 (40.81)	47 (40.51)	15(40.55)	10 (40)	25(40.32)	3(11.12)	1(5.56)	4(8.89)	44(33.59)	31(33.69)	75 (33.64)
Business	2 (2.98)	1(2.04)	3(2.59)	2(5.4)	-	2 (3.22)	2(7.4)	1(5.56)	3(6.67)	6 (4.59)	2(2.18)	8(3.58)
Services	1(1.48)	-	1(0.86)	1(2.7)	1(4)	2(3.22)	2(7.4)	1(5.56)	3(6.67)	4 (3.05)	2(2.18)	6(2.7)
Other Occupations	8 (11.95)	6 (12.25)	14(12.08)	6(16.22)	4(16)	10(16.12)	4(14.81)	2(11.11)	6(13.34)	18(13.75)	12(13.04)	30(13.46)
Total	**67 (57.76)**	**49 (42.24)**	**116 (52.01)**	**37 (59.68)**	**25 (40.32)**	**62 (27.8)**	**27 (60)**	**18 (40)**	**45 (20.18)**	**131 (58.75)**	**92 (41.25)**	**223**

Source: Author's calculation from Field Survey, January-February, 2017

Note: Wage Laborers*- Stone cutting workers, construction workers, service holders, and businessmen

Other occupations- Forest products collectors and making plates

Other Castes- OBC and General Castes

Figures in the brackets indicate the percent of the Total Working Population

The occupational structure determines the household's income and social status in society. A positive relationship between occupational structure and economic development determines the overall standard of living of a household (Banu, 2015). Hence, the above indicators are one among the most crucial measures to understand the socio-economic condition of the community in the studied villages. The information about the occupational status of individuals was collected and classified into six categories. The occupational distributions among the populations in all three villages show a fascinating and contradictory situation. The occupational status varies diversely. Both agricultural and wage male and female labourers dominate the occupational status amongst the various social groups in Babjore village of Balangir district. The majority of agricultural cultivators belong to the OBC community (55.56 percent), followed by the general households. In comparison, the SC and ST households have a population percentage of 19.83 percent and 14.52 percent engaged as agricultural cultivators in Babjore village. The agricultural labourer percentage is higher among the SC (24.14 percent) and ST (22.6 percent) for both males and females than the OBC and general communities (15.26 percent). Wage labourers are found more among the SC and ST communities in both male and female members compared to other communities. Other communities are majorly engaged in business in comparison to SC and ST communities. In other occupations, both males and females of the SC (16.22 percent) and ST (16.12 percent) community are found in a higher proportion than the other communities (13.34 percent). The overall picture of occupational structure tells that both men and women are equally engaged in different activities in the Babjore village of Balangir district.

Table- 5.9: Caste and Sex-wise Occupational Structure of the Households in the Two Villages

Bhitarapadamajhi Village									
Occupational Structure	**SC**			**ST**			**Grand Total**		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Agri. Cultivators	1 (16.67)	1 (20)	2 (18.18)	13 (13.26)	10 (10.87)	23 (12.1)	14 (13.46)	11 (11.34)	25 (12.44)
Agri. Labourer	1 (16.67)	1 (20)	2 (18.18)	15 (15.3)	13 (14.13)	28 (14.73)	16 (15.39)	14 (14.43)	30 (14.3)
Wage Labourer	3 (50)	2 (40)	5 (45.46)	36 (36.74)	33 (35.87)	69 (36.31)	39 (37.5)	35 (36.08)	74 (36.82)
Business	-	-		7 (7.14)	6 (6.52)	13 (6.85)	7 (6.74)	6 (6.18)	13 (6.47)
Services	-	-	-	-	-	-	-	-	-
Other Occupations	1 (1.66)	1 (20)	2 (18.18)	27 (27.56)	30 (32.6)	57 (30)	28 (26.92)	31 (31.96)	59 (29.35)
Total	**6 (54.55)**	**5(45.45)**	**11 (5.48)**	**98 (51.58)**	**92 (49.42)**	**190 (94.52)**	**104 (51.75)**	**97 (49.25)**	**201**
Tikarpadar Village									
Occupational Structure	**SC**			**ST**			**Grand Total**		
	Male	**Female**	**Total**	**Male**	**Female**	**Total**	**Male**	**Female**	**Total**
Agri. Cultivators	12 (17.91)	6 (12)	18 (15.38)	3 (15.79)	2 (9.52)	5 (12.5)	15 (17.42)	8 (11.27)	23 (14.65)
Agri. Labourer	15 (22.39)	8 (16)	23 (19.66)	2 (10.53)	3 (14.29)	5 (12.5)	17 (19.76)	11 (15.5)	28 (17.84)
Wage Labourer	19 (38.35)	13 (26)	32 (27.35)	4 (21.05)	3 (14.29)	7 (17.5)	23 (26.75)	16 (22.54)	39 (24.84)
Business	3 (4.48)	2 (4)	5 (4.27)	3 (15.79)	1 (4.77)	4 (10)	6 (6.98)	3 (4.22)	9 (5.73)
Services	-	-	-	-	-	-	-	-	-
Other Occupations	18 (26.87)	21 (42)	39 (33.34)	7 (36.84)	12 (57.14)	19 (47.5)	25 (29.06)	33 (46.48)	58 (36.95)
Total	**67 (57.26)**	**50 (42.74)**	**117 (74.52)**	**19 (47.5)**	**21 (52.5)**	**40 (25.48)**	**86 (54.78)**	**71 (45.22)**	**157**

Source: Author's calculation from Field Survey, January-February, 2017

Note: Wage Laborers*- Stone cutting workers, construction workers, service holders, and businessmen

Other occupations- Forest products collectors and making plates

Other Castes- OBC and General Castes

Figures in the brackets indicate the percent of the Total Working Population

The economic development of a country is very much associated with the occupational structure. The country's per capita income level and economic progress rise as more and more work-force moves from agricultural sectors to industrial and service sectors. The two villages Bhitarapadamajhi and Tikarpadar are showing contrasting figures as compared to Babjore village. In the two villages, majority of the people are engaged in other occupations like hunting, collecting forest products rather than being cultivators and wage laborers due to low land

holdings and decreased occupational opportunities. The above table 5.9 shows the various occupational structures among both SC and ST households in Bhitarapadamajhi and Tikarpadar villages of Rayagada district. People belonging to only SC and ST tribal communities live in both these villages. It was found that more agricultural cultivators are present among the SC households (18.18 percent) than ST households (12.1 percent) for both male and female members. Likewise agricultural labourers show the same figures where more SC households (19.66 percent) are engaged in this occupation than the ST households (12.5 percent). However, maximum households are engaged as wage labourers in both communities (27.35 percent for SC members and 17.5 percent ST household members). Very few SC and ST households delve into business activities. Furthermore, 18.18 percent SC and 30 percent ST households find work in other occupations in the Bhitarapadamajhi village of Rayagada district. In the case of Tikarpadar village, where agricultural cultivators is higher for SC (15.38 percent) than ST households (12.5 percent) followed by agricultural and wage labourer. Very few households are found in the business activities (for both male and female members) and none of the family members are enter into services. The highest percentage, 33.34 percent SC households and 47.5 percent ST households are found in other occupations. It can be clearly seen from the above table that both male and female are employed in different occupational activities in both these villages. Majority of the population are unable to do cultivation due to lack of irrigation facilities that leads to low production and food insecurity among the tribal people in both villages. There are both males and females running small businesses like selling forest products in weekly market in the two villages of Rayagada district.

Table- 5.10: Major Sources of Income of the Households in the Sample Villages of Two Districts (Per Year- in Rupees)

Sources of Income (in Rs.)	**Balangir District**	**Rayagada District**		
	Babjore Village	**Bhitarapadamajhi**	**Tikarpadar**	**Total**
Agriculture	4050 (12.02)	1750 (9.6)	1640 (9.43)	3390 (9.53)
Forest Products	2830 (8.3)	5230 (28.67)	6820 (39.22)	12050 (33.82)
Wage Labour	20355 (60.31)	6200 (34)	4360 (25.07)	10560 (29.65)
Other Occupations	6455 (19.6)	5050 (27.7)	4570 (26.28)	9620 (27)
Total	**33690 (100)**	**18230 (100)**	**17390 (100)**	**35620 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicates the percent of the Total Income
Other occupations- Forest products collectors and making plates

The source of income is one of the most critical parameters in the socio-economic set-up of any household in a society. A particular household earns their income from various sources, as more is the source more will be income-earning. The above table explains how households draw income from various sources in the sample villages of the two districts. They earn mostly as agricultural labour followed by other occupation and also from agricultural cultivations. The maximum, (60 percent income) comes from wage labour as a majority is employed in different works within as well as outside the state, migration carried in prospects of higher wages. On the other hand, it is an entirely different situation in the two villages of Rayagada district, where only 34 percent are wage earners followed by income earners from forest services in Bhitarapadamajhi while the maximum earnings come from forest service (40 percent) followed by other occupations in the Tikarpadar village. The broad picture of all three villages indicate that maximum earning is from wage earners as they have better income opportunities in the Babjore village while it is not there in both villages of Rayagada district.

Table- 5.11: Wage Status of the Household Members in the Sample Villages of Two Districts (Per Day)

Wages	**Balangir District**	**Rayagada District**		
(In Rupees))	**Babjore Village**	**Bhitarapadamajhi**	**Tikarpadar**	**Total**
Less than 100	22 (13.01)	74 (52.86)	68 (64.76)	142 (57.97)
100-150	37 (21.9)	48 (34.28)	25(23.8)	73 (29.9)
150-200	86 (50.88)	15 (10.72)	9 (8.58)	24 (9.9)
200 & above	24 (14.2)	3 (2.15)	2 (1.9)	5 (2.4)
Total	**169 (100)**	**140 (100)**	**105 (100)**	**245 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total laborer

Wage is one of the crucial and vital variables that decide the overall economic condition of any particular family in the society. That means higher is the wage; higher will be the income that leads to a higher level of standard of living. Furthermore, differences in wage rates between the different groups lead to inequality in the society. The above table describes that 50.88 percent people earn 150-200 rupees per day in Babjore village of Balangir district due to better employment opportunities or people migrate to other states for better earning. However, the two villages of Rayagada district show a disturbing trend where majority of 52.86 percent people

earn less than 100 rupees per day in Bhitarapadamajhi and 64.76 percent in Tikarpadar village. Just 2.15 percent and 1.9 percent of the population earns more than 200 rupees per day in Bhitarapadamajhi and Tikarpadar village respectively. The most important reasons for low wage rates in both villages are lack of land resources, low employment opportunities, lack of migration among the people, no government employment schemes. There is a huge wage disparity in all three villages of two districts in the KBK Region.

Table- 5.12: Distribution of Households based on income in the Sample Villages of Two Districts (Per Year)

Income Groups (in Rupees)	**Balangir District**	**Rayagada District**		
	Babjore Village	**Bhitarapadamajhi**	**Tikarpadar**	**Total**
Below 10000	26 (36.74)	62 (77.5)	57 (81.42)	119 (79.34)
10000-15000	18 (18.37)	7 (8.75)	6 (8.58)	13 (8.66)
15000-20000	19 (19.38)	6 (7.5)	4 (5.72)	10 (6.66)
20000 & above	24. (24.48)	5 (6.25)	3 (4.28)	8 (5.34)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicates the percent of the Total Households

The above table 5.12 discusses the distribution of households based on the level of income in the sample villages of two districts. Household income is one of the major factors that determine the standard of living of the family. The data collected for an annual income of individual household shows that 36.74 percent households earn below 15000 rupees and more than 24 percent households earn above 20000 rupees in a year in the Babjore village of Balangir district. In the other two villages in Rayagada district, Bhitarapadamajhi and Tikarpadar show a very alarming and low-income status of the households, where 77.5 percent and 81.42 percent households respectively earn less than 15000 rupees per year respectively. The overall picture of the three villages tells that Babjore village has better income status due to access to better land holdings, higher wages and well-functioning of social safety net whereas the income status of other two villages is very low due to low land holdings, low wages and malfunctioning of social welfare schemes in the Rayagada district.

Table- 5.13: Saving Status of the Households in the Sample Villages of the Two Districts (Per Annum)

Saving of the Households (Rs.)	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi	Tikarpadar	Total
Less than 1,000	11 (11.22)	5 (6.25)	3 (4.28)	8 (5.34)
1000-2000	13 (13.26)	2 (2.5)	1(1.43)	3 (2)
2000-3000	10 (10.2)	1 (1.25)	2 (2.85)	3 (2)
3000 & above	26 (26.45)	1 (1.25)	1 (1.42)	2 (1.34)
Don't save	38 (38.78)	71 (88.75)	63 (90)	134 (89.34)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: Figures in the brackets indicates the percent of the Total Households

Saving plays an important role in determining the economic status of a household that comes from after consumption and other expenditures. That means higher income leads to higher savings and vice versa. The above table deals with the saving status of the households in the surveyed villages of the two districts. The table shows that 26.45 percent households save more than 3000 per year while 38.78 percent households do not save at all due to low-income status in Babjore village of Balangir district. On the other hand, the saving status of the tribal people is very low, where only 12 percent households and 10 percent households save in Bhitarapadamajhi and Tikarpadar village respectively. 88 percent of the population in Bhitarapadamajhi and 90 percent in Tikarpadar village do not have any savings due to low income and fewer resources.

5.3: Physical and Economic Access to Food

The availability of food and the individual's access to food determines the food security status of any individual in the society. For an active and healthy life of an individual, there is a need for adequate physical and economic access to safe, sufficient and nutritious food. That means, there should be an adequate amount of food grain both at the macro and micro level. In other words, the combinations of domestic food stocks, food aid from other countries and agencies, net exports, and domestic food grain production determine food availability in the country. Moreover, at the micro and individual level, physical access to food means either access to its production, or purchase from the market. The economic access can be guaranteed when all the family members have adequate and sufficient means of resources to acquire the required

quantity, quality and diversity in food. It mainly depends upon two factors like family's buying capacity and prices of food grains. The physical and economic access among the people in the Babjore village of Balangir district is much better than the Bhitarapadamajhi and Tikarpadar villages of Rayagada district. It is due to the better economic status of the households, high level of production and well-functioning of PDS in Balangir district in comparison to Rayagada district of KBK Region in Odisha.

The agricultural production pattern assumes an important place in tribal economies as it has a direct and indirect impact on employment. One primary source of food security of tribal people comes from what is known as shifting cultivation or more appropriately (*swiddening* or *Podu Chasa),* also known as slash and burn and also from the forest products. Shifting cultivation and its practices are said to be pernicious and eco-hostile. The tribal people plough both wetland and upland for different cultivations. They also use manure and chemical fertilizers, pesticides and insecticides, but very few of them use those modern inputs in their field. The tribal women and children gather various forest products Minor Forest Products (MFP) for food, drink, fodder, medicine, and house-building, as well as for agricultural or other domestic purposes (Mishra and Toppo, 2008). They cultivate food grains like paddy, *Mandia*, red grams, cereals, and vegetable for their self-consumption. The table below explains about the major crops cultivated by the tribal households in the sample village.

Table- 5.14: Major Crops cultivated by the Households in the Sample Villages of Two Districts

Major Crops	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi	Tikarpadar	Total
Paddy	26 (26.54)	3 (3.75)	2 (2.85)	5 (3.34)
Cereals	31 (36.74)	29 (36.25)	16 (22.85)	45 (30)
Others	6 (6.12)	2 (2.5)	1(1.5)	3 (2)
Landless	35 (35.72)	46 (57.5)	51 (72.85)	97 (64.66)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Households
Cereals Include millets, Bajra, *mandia* and red grams and other includes different vegetables and cotton

The above table 5.14 describes the major crops grown by the farmers in the surveyed villages of two districts. The household information regarding the major crops in the study area is collected and also analyzed broadly. The result shows that there are seven significant crops, including cotton cultivated by the farmers. Maximum farmers (36.74 percent) in the Babjore village of Balangir district, cultivate cereals followed by paddy as they eat rice and cereals for their daily consumption. On the other hand, the other two villages show a contrasting figure regarding the cultivation where a very small proportion of farmers, 42 percent in Bhitarapadamajhi and 30 percent in Tikarpadar village are doing farming, and remaining households are landless in the Rayagada district. The overall picture of the three villages tells that while one village is doing better in agricultural cultivation in Balangir district, the other two villages are backward due to lack of access to land in Rayagada district of KBK Region.

Table- 5.15: Area under Different Crops among the Households in the Sample Villages of Two Districts

Variety of Crops Cultivated	Balangir District (Land Allotted to Different Crops)	Rayagada District (Land Allotted to Different Crops (In Acres)		
	Babjore Village (In acres)	Bhitarapadamajhi Village (In Acres)	Tikarpadar Village (In Acres)	Total
Paddy	33.5	4.75	2.65	7.4
Millets	12.75	5.5	5.25	10.75
Bajra	3.75	1.5	1.25	3.75
Mandia	8.35	12.45	9.35	21.8
Red Grams	13.85	9.5	6.5	16
Vegetables	10.65	1.55	1.25	2.8
Cotton	3.15	0.75	0.65	1.4
Total Cultivated Land	**86**	**36**	**28**	**64**

Source: Author's calculation from Field Survey, January-February 2017
Note- The study has taken the total cultivated land area of every single village in a particular year

The above table deals with the area under different crops among the households in a year in the sample villages of two districts. The study has taken total cultivated land area and distributed among the various crops in a year. Moreover, the farmers cultivate different crops for their self-consumption and selling in the market. The table tells that, they cultivate crops like paddy, millet, Bajra, *mandia*, red grams, vegetables and one cash crop is cotton. The maximum 33.5 acres of land goes into for paddy cultivation because rice is the most principal food among people in Odisha followed by red grams (13.85 acres), millets (12.75 acres), and vegetables

(10.65 acres) in the Babjore village of Balangir district. On the other hand, the figures and scenario is entirely different in other two villages of Rayagada district where maximum 12.45 acres of land allotted to *mandia*, as it is one of the most essential food items of the tribal people and followed by 9.5 acres, millets 5.5 acres and paddy 4.75 acres of land in the Bhitarapadamajhi village while it is 9.35 acres to *mandia*, 6.5 acres to red grams, 5.25 acres to red grams and 2.65 acres of and to paddy cultivation in the Tikarpadar village. The overall broad pictures of all three villages tell that more percentage of land allotted to paddy cultivation in the Babjore village of Balangir district whereas more land allotted to *mandia* cultivation in the Bhitarapadamajhi and Tikarpadar villages of Rayagada district.

Table- 5.16: Distribution of Costs of Cultivation in the Sample Village of Two Districts in a Year (per Acre- in Rupees)

Types of Crops	**Costs of Cultivation- Bagjore Village (in Rupees)**				
	Labour Costs	**Input Costs**	**Harvesting Costs**	**Other Costs**	**Total Costs**
Paddy	550	275	180	150	1155
Cereals	275	180	150	120	725
Other Crops	190	125	160	175	650
Total	**1015**	**580**	**490**	**445**	**2530**
Types of Crops	**Costs of Cultivation– Bhitarapadamajhi Village (in Rupee)**				
	Labour Costs	Input Costs	Harvesting Costs	Other Costs	**Total Costs**
Paddy	250	155	120	100	625
Cereals	210	180	100	120	610
Other Crops	100	110	130	110	450
Total	**560**	**405**	**350**	**330**	**1685**
Types of Crops	**Costs of Cultivation -Tikarpadar Village (in Rupees)**				
	Labour Costs	Input Costs	Harvesting Costs	Other Costs	**Total Costs**
Paddy	190	175	100	110	575
Cereals	170	120	115	125	530
Other Crops	100	110	120	100	430
Total	**460**	**405**	**335**	**335**	**1535**

Source: Author's calculation from Field Survey, January-February 2017
Note: Cereals Includes millets, Bajra, *mandia*, and red grams
Other Costs include transportation costs

The cost of production plays important and crucial role in determining the agricultural production and farm income of a farmer. In other words, higher is the cost of cultivation leads to

lower production and net income of the farmer and vice-versa. The above table deals with the cost of cultivation in three villages of two districts. Mainly the cost of cultivation includes paying wages to the labourer, expenditure on various inputs like pesticides, expenditure during the time of harvesting and also other expenditure. An average farmer spends around 2530 rupees per acre in a year in the Babjore village of Balangir district whereas it is 1685 rupees in Bhitarapadamajhi village and 1535 rupees in Tikarpadar village in the Rayagada district. In the latter case, where the tribal people have less land in two villages of Rayagada district compared to other social groups in the Balangir district. The maximum 40 percent households paid to agricultural wages in three villages followed by input costs and harvesting costs in all three villages of two districts.

Table- 5.17: Food Grains Production and Requirements of Households in the Sample Villages of Two Districts

Bagjore Village (Per Year and in Quintals)							
Family Size	Home Production	From Market	From PDS	From Others	Actual Total Consumption	Actual Total Requirements	Difference /Gap
1-3	4.45	1.55	1.1	0.25	7.35	7.2	0.15
3-6	6.25	2.15	1.7	0.4	10.5	10.15	0.35
6-9	7.25	2.1	2.2	0.45	12	12.25	-0.25
Above 9	8.55	3.3	2.35	0.55	14.75	15.35	-0.6
	Bhitarapadamajhi Village (Per Year and in Quintals)						
Family Size	Home Production	From Market	From PDS	From Others	Actual Total Consumption	Actual Total Requirements	Difference /Gap
1-3	2.75	1.95	0.8	0.45	5.95	7.35	-1.4
3-6	3.45	4.05	0.95	0.6	9.05	10.20	-1.15
6-9	4.55	4.35	1.2	0.75	10.85	12.15	-1.3
above 9	5.8	4.95	1.75	0.85	13.15	15.25	-1.9
	Tikarpadar Village (Per year and in Quintals)						
Family Size	Home Production	From Market	From PDS	From Others	Actual Total Consumption	Actual Total Requirements	Difference /Gap
1-3	2.5	2.15	0.55	0.35	5.55	7.25	-1.7
3-6	3.65	3.75	0.75	0.55	8.7	10.15	-1.55
6-9	4.15	4.05	0.95	0.6	9.75	12.2	-2.45
Above 9	5.95	4.85	1.25	0.75	12.8	15.1	-2.3

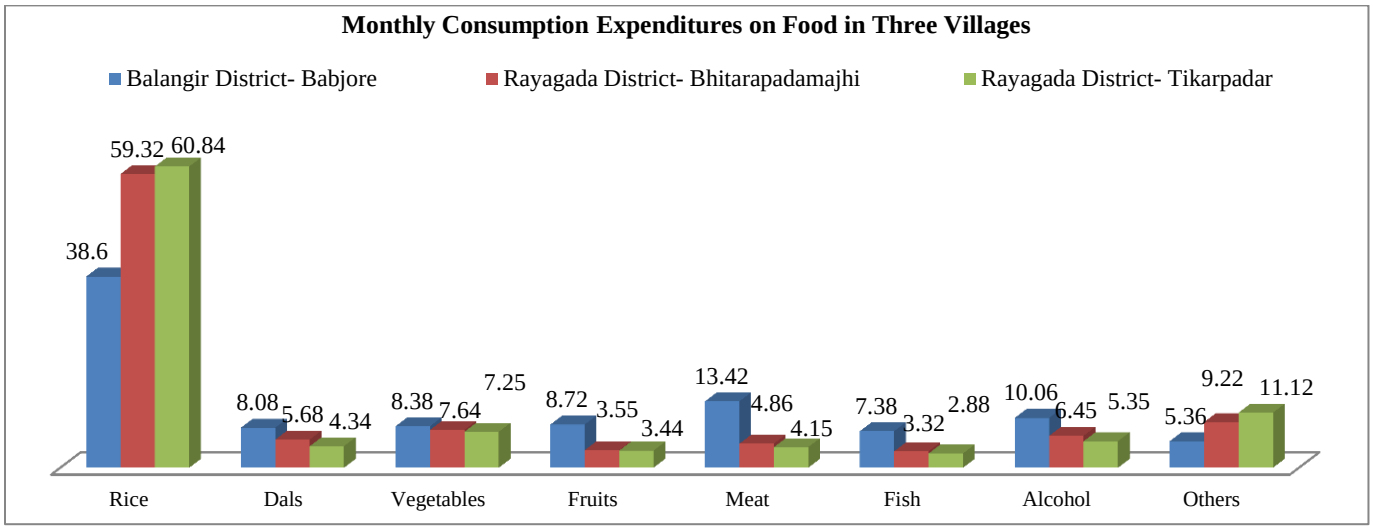
Source: Author's Calculations from Field Survey, January, and February 2017
Note- Other means borrowing from relatives and neighbours

The above figure deals with food grain production and food grain requirements of different family size range from minimum one and maximum more than nine. Moreover, any particular households require a minimum amount of different food grains for their healthy

survival in society. Some households meet their requirement by their own capacity, whereas some households do not have the minimum level of food grains for their daily requirement. However, they try to manage and fulfill their needs through different ways like home production, buying from the market, getting essential items from ration shops and relatives for their daily requirement. It is clearly visible that, small size families (1-3 acres and 3-6 acres) are able to meet their daily requirement due to having a smaller number of people and having sufficient amount of resources like land holdings and buying capacity whereas large size households are not able to meet their daily requirement due to different reasons. The table shows that large size household's requirement falls short of actual consumption and there is a small gap between actual consumption and actual requirements in Babjore village of Balangir district. On the other hand, the actual consumption and requirements of the two villages show very contrary figure in the Rayagada district, as the two villages are tribal-dominated villages, where all family size whether small or large are not able to fulfill the minimum daily requirements for their survival due to low resources, low level of income and malfunctioning of social welfare schemes resulting in food insecurity among them.

The consumption pattern varies from households to households, communities to communities, states to state, regions to regions, and countries to countries in the world. However, the life of a person is flourished and nurtured by consumption, and the plenitude of consumption is the lifeblood of human development (Swaminathan, 2007). The study has found out that, there is a change in food consumption among the various social communities not only in Odisha but also among the households in sample villages of the two districts. Adding to that, it is found that their consumption has changed but not much like in the cities or coastal parts of the state. There are various factors which hold them back and stick to their traditional way of living. Moreover, rice and *mandia* are the leading staple food of the tribal people. The study has explained the pattern of monthly expenditure of the indigenous and other non-tribal families in the sample villages of two districts in the KBK Region of the state.

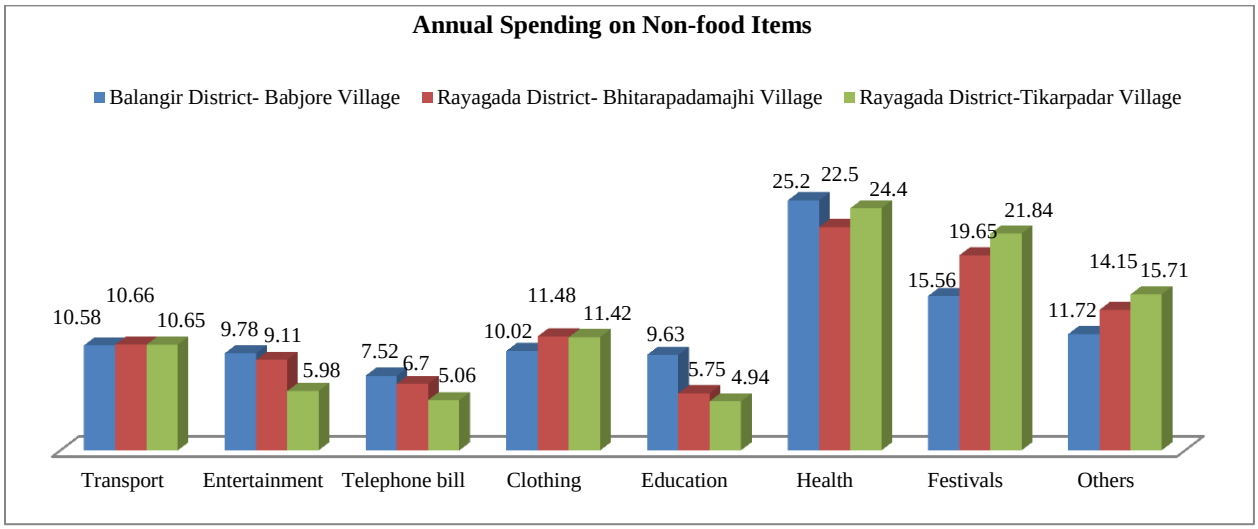
Figure-5.1: Monthly Consumption Expenditure on Food in the Sample Village of Two Districts



Source: Author's calculation from Field Survey, January-February, 2017
Note- Figures are in percentage of Total Expenditures
Other includes Traditional food items from the local market

The above figure deals with the monthly consumption expenditure of the households in the sample villages of Balangir and Rayagada district. As we know, consumption status is one of the critical indicators of social and economic status in any society. However, there are various factors like land holding, per capita income and food prices that determine the consumption of a household. The above table explains that households spend money on various food items for their daily consumption and mostly rice and other essential items as rice is the most staple food in Odisha, including three villages of two districts. Figure 5.2 shows that a typical household spend 38.6 percent of their total income on rice followed by meat and alcohols and vegetables in the Babjore village of Balangir district. It also describes the monthly expenditure of tribal households in Bhitarapadamajhi and Tikarpadar villages of Rayagada district. The maximum 59.32 percent and 60.84 percent spent on rice consumption of the total expenditure followed by vegetables and others. The expenditure pattern is very high among the households in Babjore village in compared to the other two villages of Rayagada district. In other words, the tribal people are not able to spend the required amount of money on food items due to low level of income. In recently, the consumption pattern has changed drastically among the tribal and non-tribal people due to various factors like change of taste and preferences, an increase of income and urbanization.

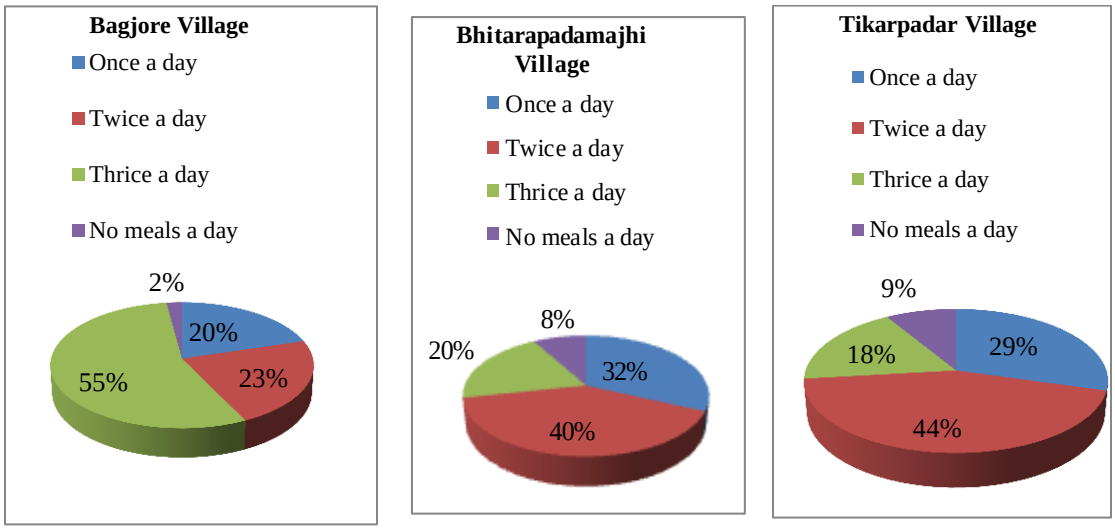
Figure-5.2: Annual Expenditure on Non-food Items in the Sample Village of Two Districts



Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Expenditure
Other expenditure includes electricity bills and electronics

There are various reports which show that there has been a drop in monthly per capita consumption spending on food items and expenditure on non-food items has gone up for the last four decades in the country. Moreover, the trend is the same in Odisha also due to several factors. The non-food expenditures are an essential component of the household's total expenditure. From the figure, it is found that the maximum expenditures are incurred on health followed by the festivals, others and transports. In the Babjore village, maximum non-food expenditures are spent on health (25.2 percent) followed by the festival (11.72 percent), other (11.72 percent) and transport (10.58 percent) and clothing (10.2 percent) respectively in the Balangir district. But the expenditure pattern on non-food items is little bit different in other two villages of Rayagada district where maximum expenditure goes into the health (22.5 and 24.4 percent) followed by festivals (19.65 and 21.84 percent), others (14.15 and 15.71 percent), clothing (11.48 and 11.42 percent) in Bhitarapadamajhi and Tikarpadar villages. The overall broad pictures of expenditures on non-food describe that maximum spending goes into health and entertainment in all three villages of two districts of KBK Region. The importance of non-food expenditure has grown by leap and bounds due to the rise in income of the people in the society and as it is true in the case of districts of KBK Region.

Chart- 5.3: Household Members take the Number of Meals a Day in the Sample Villages of Two Districts (Per Month)



Source: Author's calculation from Field Survey, January-February, 2017

Historically and most importantly food is one of the utmost indispensable necessities for every person and also their growth and development. Not only the amount and quality of food is important but also the number of times a person takes a meal in a day is very crucial, as it provides very much required amount of intake to that person. The number of meals of a person depends on the availability of food in particular households, getting essentials items from ration shops and buying capacity. The above figure 5.4 deals with the number of meals taken by the household members in the three villages of two districts. In the case of Babjore village, maximum 55 percent household members take three square meals a day followed by 23 percent twice a day and only 5 percent household members never take meals because of unavailability of food grains and lack of low buying capacity in a month. Bhitarapadamajhi and Tikarpadar villages show a very worst and negative picture about the number of meals taken among the household members in the Rayagada district. It shows that only 20 percent household member take three square meals a day in Bhitarapadamajhi and 16 percent in Tikarpadar village. Moreover, 34 percent and 27 percent members take one-square meals a day in both these villages. However, most importantly, 8 percent and 9 percent of the total do not take a meal at all in respective villages. And most importantly, maximum household members only take two square meals a day because of food unavailability and access to food grains in both these

villages. The overall broad pictures of all three villages show that Babjore village of Balangir district is better than the other two villages of Rayagada district in terms of the number of meals by the household members taken per day.

Table- 5.18: The Most Important Reasons for not taking Meals in a Day in the Sample Villages of Two Districts

Reasons	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi	Tikarpadar	Total
Lack of availability of food	26 (26.54)	21 (26.25)	16 (22.86)	37 (24.66)
Lack of purchasing power	41 (41.83)	38 (47.5)	36 (51.42)	74 (49.34)
Other reasons	31 (31.63)	21 (26.25)	18 (25.72)	39 (26)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Households
Other Reasons include unavailability of ration items, long-distance of market and erosion of forests

The above table deals with the essential reasons for not taking meals by the household members in the three villages of two districts in the KBK Region. There could be various reasons like due to lack of food available at home, lack of buying capacity, due to lack of employment opportunities and lastly due to malfunctioning of welfare schemes for not taking food by the household member of the family. All those factors will lead to food insecurity among the household members in the sample villages. Here is the case of three sample villages in two districts of KBK Region. It is notable that, mostly 41 percent households come under low buying capacity which is one of the crucial factors for fulfilling three square meals a day and it is among the SCs and STs households that faced food insecurity in the Babjore village of Balangir district. On the other hand, the case is different in other two villages of Rayagada district where, maximum 47.5 percent and 51.42 percent replied that due to lack of purchasing power, they are unable to fulfill three square meals a day in the Bhitarapadamajhi and Tikarpadar villages respectively.

5.4: Role of State in Providing Food Security through PDS

In any welfare state, one of the most primary and essential duties of the state is to provide food security to its people. Moreover, PDS is one of the most potent instruments for providing important food grains and other essential items at reasonable prices, particularly for the weaker

section of the society. And most importantly, the government provides food security to the poor people at the micro-level through PDS programme. Food security for any state meant a sufficient quantity of necessary goods made available to all people at all times. However, the functioning of PDS is very much appreciated in the state of Odisha for last one decade due to efficient management, equitable distribution and good governance. As a result, it has been made able to provide food security to the larger segments of society in the state. However, there are some regions like KBK where maximum tribal people living are deprived of accessing the PDS due to various reasons. In the study area, the PDS has served well in providing food grains and other important items to the people in the Babjore village of Balangir district due to proper implementation and awareness. Nevertheless, it has failed in giving basic food grains and other essential items to the poor indigenous people since various schemes are not functioning properly and most importantly unavailability of PDS ration shops in the Bhitarapadamajhi and Tikarpadar villages of Rayagada district in KBK Region of Odisha.

Targeting Errors

The targeting errors will arise because of attempts being made to give the social doles of various welfare schemes to very specific sections in the society. Moreover, the exclusion errors (Type-I Error) refer to the exclusion of deserving poor people out of the welfare scheme. This is called 'F' Mistake by (Cornea and Stewart, 1993) on account of the failure of government welfare programmes for reaching to the poor people in the country. Likewise, wrong inclusion (Type-II Error) states that the inclusion of non-poor people in the system because of various reasons. There are termed as 'E' mistakes. That is a mistake of excessive coverage (ibid). Cornia and Stewart (1993) had calculated the errors of targeting in the following way.

$$\mathbf{N = Pi + Pe + NPi + NPe}$$

Where 'N' refers to all households, 'P' refers to poor households, NP' refers to non-poor households, and the superscripts i and e refer households included and excluded from a targeted program. With this classification, the errors of exclusion can be gauged from the value of Pe, which is the number of poor households excluded from a targeted programme. Alternatively, Pe/N, the proportion of all households that are both poor and excluded, can be used to measure the errors of wrong exclusion. Similarly, the errors of wrong exclusion can be gauged from NPi,

the number of non-poor families included in the program, or NPi/N that is the proportion of all households wrongly included in the coverage of the targeted program. In order to measure the poverty line, the cut-off income level is Rs. 695 per month for rural areas in Odisha based on Tendulkar Methodology on the estimation of poverty (Odisha Economic Survey, 2014-15 and Planning Commission Report on Estimation of Poverty, 2014) per households in Odisha. The study has calculated the poor and non-poor families by using that cut-off income level in the three surveyed villages of two districts. The study used Tendulkar Methodology while calculating the poor and non-poor households in the sample villages of the KBK Region in Odisha.

Table- 5.19: Type of Households in the Sample Village of Balangir District

Type of Households	Bagjore Village
Poor	36 (36.74)
Non- poor	62 (63.26)
Total	**98 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Households

The table 5.16 explains in details about the number of poor and non-poor households in the surveyed village of Balangir district. The study surveyed 98 households in the Babjore village where it found that there is 36.74 percent of families are poor, and 63.26 percent of households are non-poor. The researcher has used the Tendulkar Methodology for calculating the poor and non-poor among the households in the surveyed village.

Table- 5.20: Ration Cards possessed by the households in the Sample Village of Balangir District

Type of Ration Cards	Bagjore Village
BPL	50 (51.02)
APL	19 (19.38)
No Cards	29 (26.54)
Total	**98 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percentage of the Total Households
BPL includes Annapurna and Antodaya =12 (BPL) + 2 (Antodaya) + 4 (Annapurna) = 18

Above the Poverty Line (APL**)** - They entitled to 7 kg of wheat and 4 litres of kerosene per month. Below the Poverty Line (BPL) – They entitled to 5 kilos of rice per person, 2 kg sugar and 4 litres of kerosene per month. Antyodaya Anna Yojana (AAY) – They are entitled to 35 kilos of rice, 2 kilos of sugar and 4 litres of kerosene per month and Annapurna (AP) – They entitled to 10 kilos of rice with free of cost per month.

The above table tells about the ration cards possessed by the households of the village. The study surveyed 98 households in the sample village, where 18 households (22.5 percent) are BPL cardholders, including two households are Antodaya; four households are Annapurna card holders, 13 households (16.25 percent) are APL cardholders, and rest 49 households (61.25 percent) do not have cards at all. They all are the deserving poor people and denied the allotment of ration cards.

Targeting Errors in the Bagjore Village

Total numbers of households are - 98

Total numbers of poor households are - 36

50 BPL + 19 APL + 29 do not have cards

Total numbers of non-poor households are - 62

6 APL + 11 BPL

Out of 19 APL cardholders, 7 Poor households are included in that group by wrong identification whereas in 50 BPL households four non-poor households have made into that group. Forty-six poor households are getting benefit from the PDS scheme. Out of the total households, 29 households do not have cards, 27 are poor households, and 2 are non-poor households.

Table- 5.21: Targeting Errors in the Sample Village of Balangir District

Targeting Errors	**Balangir District (Babjore Village)**
Exclusion Errors	34.7
Inclusion Errors	11.11
Actual Poor People Benefited	74.2

Source: Author's calculation from Field Survey, January-February, 2017

Note: Formula of Targeting Errors - Ni + Ne + NPi + NPe =18 + 46+ 11 + 6 = 80

The study surveyed 98 households in the sample village. Out of 98 households; there are 62 three poor households and 36 non-poor households. The study found there are 46 BPL cardholders including the AAY and Annapurna cardholders. Moreover, four APL cardholders are non-poor households (APL cardholders) are getting into the BPL card list. The 34 households are very poor people but not given any cards at all due to different reasons. The above statistical figure shows that there is 34.7 percent of exclusion errors in the sample village, it indicates that where 35 percent of poor tribal and Dalit people excluded from the targeted PDS program. It indicates that there are medium levels of exclusion errors among poor households in the study village. There is an only 11 percent inclusion error in this village; it means that only 11 percent non-deserving families made into the BPL lists. 74.2 percent of poor tribal and Dalit households benefited in the sample village. The overall figure tells about the well-functioning of the schemes, but it has to reach out more to that section so that it will help to achieve food security for them.

Table- 5.22: Type of Households in the Sample Villages of the Rayagada District

Type of Households	Bhitarapadamajhi	Tikarpadar	Total
Poor	63 (78.75)	58 (82.85)	121 (80.66)
Non- poor	17 (21.25)	12 (17.25)	29 (19.34)
Total	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Households

The numbers of poor and non-deserving families in the two villages of Rayagada district are explained in the above table. The study surveyed 150 households in the two villages, 80 percent families in the Bhitarapadamajhi and 70 percent families in Tikarpadar. In the village of Bhitarapadamajhi, out of 80 households, 63 households that mean 78.75 percent are poor households and 17 households are non-poor, it means that 21.25 percent of households are non-poor household. In the case of the second village of Tikarpadar, out of 70 households, 58 households belong to the low-income family; it means that 82.85 percent households being poor households and the rest 12 households belong to non-poor households that mean that 17.25 percent households under non-poor.

Table-5.23: Ration Cards possessed by the Households in Sample Villages of Rayagada District

Type of Ration Cards	Bhitarapadamajhi	Tikarpadar	Total
BPL	18 (22.5)	10 (14.28)	28 (18.66)
APL	13 (16.25)	8 (11.43)	21 (14)
No Cards	49 (61.25)	52 (74.29)	101(67.34)
Total	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate percent of the Total Households
Here BPL includes Annapurna and Antodaya =12 (BPL) + 2 (Antodaya) + 4 (Annapurna) = 18 (Village-1)
Here BPL includes Annapurna and Antodaya = 7 (BPL) + 2 (Antodaya) + 1 (Annapurna) = 10 (Village-2)

The above table tells detail about the type of ration cards possessed by the families of surveyed villages in the Rayagada district. And the study surveyed 150 households in the two villages, 80 households in the village, where 18 households (22.5 percent) are BPL cardholders, including two households are Antodaya, four households are Annapurna card holders, 13 households (16.25 percent) are APL cardholders, and rest 49 households (61.25 percent) do not have cards at all. They are the genuinely poor people and denied the allotment of ration cards. In the case of the second village, in which the study surveyed 70 households, there are 10 (14.28 percent) BPL cardholders including 2 Antodaya card holders, 1 Annapurna cardholders and 8 households (11.43 percent) are APL cardholder and rest 52 households (74.29 percent) are not having cards at all, they exclude from the scheme. By and large, it tells that poor tribal people in the two villages are excluded from the system due to various reasons.

Targeting Errors: Bhitarapadamajhi Village

Total numbers of households are - 80

Total numbers of poor households' are - 63

18 BPL + 4 APL + 41 do not have cards

Total numbers of non-poor households are - 17

6 APL + 11 BPL

Formula of Targeting Errors - Ni + Ne + NPi + NPe, =18 + 46+ 11 + 6 = 80

(1) Exclusion Errors: 45/63x100= 71.42 %

(2) Inclusion Errors: 11/17x100= 64.7 %

(3) Actual Poor Benefited: 18/16x100= 28.58 %

(4) Actual Non -Poor Benefited: 2/4x100= 50 %

The study surveyed 150 households in the two villages of two different Gram Panchayats in Kashipur block of the district, out of which the study surveyed 80 households in the first village. Out of 80 households; there are 63 three poor households and 17 non-poor households. The study found there are 6 BPL cardholders, out of that, 4 BPL card holders are poor, and 2BPL card holders are non-poor, but they are given BPL cards. Moreover, 4 APL cardholders are non-poor households, but out of that, 2 non-poor households (APL cardholders) got into the BPL card list. One household is Antyodaya Anna Yojana cardholder, and another household is the Annapurna cardholder, and remaining 8 poor tribal households do not have cards at all either they did have BPL nor did have APL cards. The above statistical figure shows that, there are 71.42 percent of exclusion errors in the village-1, it indicates that where 70 percent poor tribal people are excluded from the targeted PDS program, and it also indicates that those seventy percent tribal people are excluded from the scheme are most vulnerable and food insecure and open to various risks, and they are deprived of benefiting from the PDS program. It indicates that there are high exclusion errors. There exists 10 percent inclusion error in this village; it means that only 10 percent of tribal non-deserving families are made into the BPL lists. And 37.66 percent poor tribal households (those having BPL card holders) are benefiting from this targeted program, but not regularly. Those 37.66 percent of poor tribal people are getting the benefit occasionally, hardly four to five times a year.

Targeting Errors: Tikarpadar Village

Total numbers of households surveyed are - 70

Total numbers of poor households- 58

10 BPL + 6 APL + 42 do not have cards (42+6= 48 poor households excluded)

Total numbers of non-poor households- 12

5 APL + 7 BPL

Formula of Targeting Errors – N = Ni + Ne + NPi + NPe, = 10 + 48 + 7 + 5 = 70

(1) Exclusion Errors: 48/58x100= 82.75 %

(2) Inclusion Errors: 7/12x100= 58.33 %

(3) Actual Poor are benefited: 10/58x100= 17.25 %

(4) Actual Non-poor are benefited: 5/11x100= 45.45%

In the case of the Tikarpadar village, the situation is not different from the first village, and it is cent percent tribal village like the first village. The study surveyed 70 households in this village. Out of 70 households, 58 households are poor and rest 12 households are non-poor. Out of 29 households, 8 are BPL card holders, 7 households are APL cardholders, 2households are Antyodaya Anna Yojana (AAY) cardholders, and 1 household is Annapurna (AP) cardholder. Out of 8 BPL cardholders, 5 households are genuinely poor and actual BPL cardholders and rest t3 are non-poor households but included in the BPL lists. Out of 11 APL cardholders, 6 are APL cardholders and rest 5 households are included in the BPL lists. It explains that, there are more than 52 household or 82.75 exclusion errors in this village, it means that more than 52 percent poor tribal household are excluded from the system, and there are percent 12.5 are inclusion errors, it indicates that only less than 13 percent nonpoor tribal households are included in the BPL lists. Moreover, only 27.58 percent of actual poor tribal households are getting the benefit. Moreover, 45.45 percent actual non-poor tribal households are benefiting.

Table- 5.24: Targeting Errors in the Two Sample Villages of Rayagada District

Targeting Errors	Bhitarapadamajhi	Tikarpadar
Exclusion Errors	71.42	82.75
Inclusion Errors	64.7	58.33

Source: Author's calculation from Field Survey, 2017
Note: Figures are in Percent

The above table explains the targeting errors in the two sample villages of the district. It shows the targeting errors is high in the second village that is 82.75 percent and 58.33 percent is inclusion errors due to various reasons due, that means more than 82 percent of poor deserving families are out of the TPDS programme whereas it is 71.42 percent and 64.7 percent inclusion errors in the second village, it means more than 71 percent of households are excluded from the scheme in the second village. It found that the inclusion and exclusion errors are high in both these villages of two districts of KBK Region.

5.5: Nutritional Status of the Household Members in the Surveyed Villages of Two Districts

The individual's lifestyle is profoundly determined by the choice of food and food pattern he/she lives. Moreover, there are different factors like religion, education, economic factors, traditions, beliefs, notions, thoughts, and taboos which significantly influenced the food habits of a particular person in the society. It is also observed that the food consumption of tribal communities such as Damba and Jhodia Kandha depends mainly upon their socio-economic condition (Pingle, 1972). However, the choice of food and pattern of food habits of tribal communities are determined by the economic status, cultural practices and also ethnic deep-rooted practices in the country (Mahadevan, 1962). The current research attempts to analyze the consumption pattern and food habits of tribal households in their socio-cultural system in the surveyed villages of two districts. The indigenous people are more vulnerable to various diseases but the primitive tribal communities are highly susceptible to food and nutrition insecurity in the Rayagada district. Those communities mostly consume mostly consume rice, mandia, grams, and forest products. The study discovered that, the indigenous communities suffer from low-income level, low standard of living, high illiteracy, high poverty, poor sanitation, orthodox and blind beliefs and most importantly are unable to fulfill three square meals a day in the studied villages of Rayagada district of KBK Region in Odisha.

Table- 5.25: Total Consumption of Food Grains of the Household Members in Babjore Village (Per Month)

Food Items	Bagjore Village		
	Home	Out Side	Total
Rice (Kgs.)	30	3	33
Cereals (Kgs.)	5.5	1	6.5
Dals (Kgs.)	4	.500	5.5
Pulses (Kgs.)	4	1	5
Edible oils (ltrs.)	900	100	1
Milk (ltrs.)	3	1	4
Fruits (Kgs.)	2	1.5	3.5
Sugar (Kgs.)	1.5	0	1.5
Vegetables	4	1.5	5.5
Fishes (Kgs.)	2.5	0	2.5
Eggs (Numbers)	20	0	20
Meat (Kgs.)	3.5	1	4.5
Others (Kgs.)	2	1	3

Source: Author's calculation from Field Survey, January-February 2017
Note: All Figures are in Kilograms, grams, Litters and Numbers

The above table explains the total consumption of households per month in the sample village. It tells that, an average household consumes 38 kg of rice, followed by 1 kilo of wheat, 14 kg of cereals, 4 kg of dals, 10 kg of pulses, 200 ml of edible oils, 3 litres of milk, 1 kg of sugar, 3 kg of fishes and 2 kg of meat in Babjore village. Apart from their own production, they also get food grains from the market, and relatives. The home consumption includes both own and from PDS. They mostly consume rice, as it is the staple food of the people followed by mandia, different cereals, leaves and non-vegetarian foods.

Table- 5.26: Nutrition Chart of Calorie, Protein, and Fat from Different Food Items

Major Food Items	Calories Per Unit (Kcal)	Protein Per Unit (gram)	Fat Per Unit (gram)
Rice (1kg)	3460	75	5
Cereals (1kg)	8650	305	305
Dal (1kg)	3350	233	17
Pulses (1kg)	3400	220	12
Edible oil (kg)	9000	0	1000
Milk (1lt)	1000	40	70
Fruits (1kg)	1960	32	7
Sugar (1kg)	3980	1	0
Vegetable (1kg)	2633	110	18
Fishes (1kg)	1050	140	20
Eggs (numbers)	100	8	8
Meat (kg)	4310	840	96
Others	13893	36	1055
Total	**56786**	**2040**	**2618**

Source: Author's calculation from NSS Report No. 560, Nutritional Intake in India, 2011-12 and NIN Food Chart
Note: Here cereals include maize, small millets, and other cereals, Fruits includes mango, papaya, orange and jackfruit, vegetables includes, tomato, brinjal, palak, cabbage, lady's finger, potato and guard, meat includes, pork, chicken, goat, and others include curd, ghee, honey, coconut, ginger, garlic, jeera, dhania, turmeric, chilly, oilseeds, tamarind, biscuits, pickle, toddy, *Handia*, beer and wine.

Table- 5.27: Calculation of Calorie, Protein, and Fat in Babjore Village (Per Person/Day)

Major Food Items	Bagjore Village				
	Per day (Four people)	**Per person**	**Calorie**	**Protein**	**Fat**
Rice (kgs/gm)	1100	275	951.5	20.62	1.37
Cereals (gms)	216.66	54.16	468.48	16.51	16.51
Dal (gms)	183.33	45.83	153.53	10.67	0.77
Pulses (gms)	166.66	41.66	141.64	9.16	0.49
Edible oils (mls)	33.33	8.33	74.97	0	8.33
Milk (mls)	133.33	33.33	33.33	1.33	2.33
Fruits (gms)	116.66	29.16	57.15	0.93	0.2
Sugar (gms)	50	12.5	49.75	0.01	0
Vegetables (gms)	183.33	45.83	120.67	5.04	0.82
Fishes (gms)	83.33	20.33	21.34	2.84	0.4
Meat (gms)	166.66	19.16	82.57	16.09	1.83
Others (gms)	100	25	372.32	1.1	26.57
Total			**2827**	**84.31**	**59.62**

Source: Author's calculation from Field Survey, January-February, 2017
Note: Calories in kilograms, protein in grams and also fat in grams

The individual's food and nutrient intake of a particular family is calculated by using the quantity of each food items he/she consume per day, and also the study used the National Institute of Nutrition (NIN) s Nutrition Chart for calculating the average calorie, protein and fat of a person. The study took into account the whole consumption of food grains of a particular family per month and calculated calorie, protein and fat of each individual member and then divided by 30 days to get per day. The study also calculated consumption of adults and children separately for finding the accurate food and nutrition insecurity figure. The above table explains the calorie, protein, and fat per person per day in Babjore village of Balangir district of KBK Region.

Table- 5.28: Household Members fulfilled and not fulfilled the Required Calorie Norms

	Bagjore Village						
Gender	**Adults attained calorie**	**The adults do not attain**	**Total**	**Gender**	**Children attained calorie**	**Children do not attain**	**Total**
Male	55(66.26)	28 (33.74)	83 (54.6)	**Boys**	63 (57.27)	47 (42.73)	110 (53.93)
Female	47 (68.12)	22 (31.88)	69 (45.4)	**Girls**	56 (59.58)	38 (40.42)	94 (46.07)
Total	**102 (67.1)**	**50 (32.9)**	**152**	**Total**	**119 (58.33)**	**85 (41.66)**	**204**

Source: Author's calculation from Field Survey, January-February, 2017
Note: The figures in the brackets indicate the percent of the Total Population

The above table explains the household members those have fulfilled the required calorie, protein, and fat, and those have not fulfilled the required norms in Babjore village. An adequate amount of calorie, protein and fat is very much needed for any human being in society, without having sufficient calories; it will lead to food insecurity among the people. The above table shows that there is 66.26 percent adult male have met calorie standard, followed by 68.12 percent female. In the case of children, it shows that there is 57.17 percent of boys and 59.58 percent of girls have met calorie standards. Looking at the other side of the story, it says that, there is 33.74 percent adult male is not able to meet calorie standard while 31.88 percent for women. In the case of the children, it tells that only 42.73 percent boys are not able to meet those standards where there is 40.42 percent girls are not able to meet those calorie norms in the sample village. The study found that more food insecurity is observed among the ST people in that particular village. Inadequate availability of food grains and low-quality nutritious food resulted in food insecurity among the tribal people in the Babjore village of Balangir district.

Table- 5.29: Food Grains Consumption of the Household Members in the Two Sample Villages (Per Month)

	Bhitarapadamajhi			**Tikarpadar**			**Total**		
Food Items	Home	Out Side	Total	Home	Out Side	Total	home	outside	Total
Rice (Kgs.)	21	4	25	20	3	23	41	7	48
Cereals (Kgs.)	5	1	6	4	1	5	11	4	15
Dals (Kgs.)	2	1	3	2.5	1	3.5	4.5	2	6.5
Pulses (Kgs.)	3	1	4	2	1	3	5	2	7
Edible oils (Mltrs.)	400	.50	450	300	100	400	700	150	750
Milk (Ltrs.)	4	1	5	3	1	4	7	2	9
Fruits (Kgs.)	4.5	1.5	6	3	2	5	7.5	3.5	11
Sugar (Kgs.)	.500	0	.500	.500	0	.500	1	0	1
Vegetables (Kgs.)	3	1.5	4.5	3	1	4	6	2.5	8.5
Fishes (Kgs.)	1.5	0	1.5	1	0	1	2.5	0	2.5
Eggs (Numbers.)	15	0	15	10	0	10	25	0	25
Meat (Kgs.)	3	1.5	4.5	3	1.5	4.5	6	3	9
Others (Kgs.)	1	1	2	1.5	1	2.5	2.5	2	4.5

Source: Author's calculation from Field Survey, January-February 2017
Note: All Figures are in Kilograms, grams, Litters and Numbers

The consumption of food grains and other essentials items are very much needed for human survival. The food security status of a particular person totally determined by the amount of food grains and the quality of food grains apart from other essential services. Here the study provides the monthly consumption of different food grains and other items in Bhitarapadamajhi village and Tikarpadar village of Rayagada district in KBK Region. The above table explains the total consumption of the households per month in the sample villages. It tells that, an average household consumes 25 kg of rice, 6 kg of cereals, 3 kg of dals, 4 kg of pulses, 450 ml of edible oils, 5 litres of milk, 1 kg of sugar, 3 kg of fishes and 2 kg of meat in Bhitarapadamajhi village. While coming to the Tikarpadar village, it tells that, an average household consumes 23 kg of rice, followed by 5 kg of cereals, 4 kg of dals, 3 kg of pulses, 400 ml of edible oils, 2 litres of milk, 1 kg of sugar, 10 eggs, and 1 kg of fishes and 4.5 kg of meat. The above table shows that, a typical household consumes less quantity of food grains compared to the required quantity because of the shortage of food grains and low buying capacity of the particular households and also the non-existence of PDS programme. The overall picture of the two villages reveals low consumption of the household and results in the low-calorie intake among them compared to ICMR recommended RDA norms.

Table- 5.30: Calorie, Protein, and Fat of the Household Members in Bhitarapadamajhi Village (Per Person/Day)

	Bhitarapadamajhi Village				
Major Food Items	**Per Day (Four people)**	**Per Person/Day**	**Calorie**	**Protein**	**Fat**
Rice (kgs/gm)	833.33	208.33	720.82	15.62	1.04
Cereals (gms)	200	50	432.5	15.25	12.25
Dal (gms)	100	25	83.75	5.82	0.42
Pulses (gms)	133.33	33.33	113.32	7.33	0.01
Edible oils (mls)	15	3.75	33.75	0	3.75
Milk (mls)	166.66	41.66	41.66	1.66	1.02
Fruits (gms)	200	50	98	1.6	0.35
Sugar (gms)	16.66	4.16	16.55	0.04	0
Vegetables (gms)	150	37.5	98.73	4.12	0.67
Fishes (gms)	50	12.5	13.12	1.75	0.25
Meat (gms)	150	37.5	161.62	31.5	3.6
Others (gms)	66.66	16.66	256.45	0.6	17.57
Total			**2070.27**	**85.29**	**40.93**

Source: Author's Calculation from Field Survey, January-February, 2017
Note: Calories in kilograms, protein in grams and also fat in grams

Table- 5.31: Calculation of Calorie, Protein, and Fat of the Household Members in Tikarpadar Village (Per Person/Day)

Major Food Items	Tikarpadar Village				
	The family of Four/ Day	**Per Person/Day**	**Calorie**	**Protein**	**Fat**
Rice (kgs/gm)	766.66	191.66	663.14	14.37	0.95
Cereals (gms)	166.66	41.66	350.35	12.7	7.32
Dal (gms)	116.66	29.16	97.68	6.79	0.49
Pulses (gms)	100	25	85.00	5.5	0.3
Edible oils (mls)	13.33	3.33	29.97	0	3.33
Milk (mls)	133.33	33.33	33.33	1.33	2.33
Fruits (gms)	166.66	41.66	81.65	1.33	0.29
Sugar (gms)	16.66	4.16	16.55	0.04	0
Vegetables (gms)	133.33	33.33	87.75	3.66	0.07
Fishes (gms)	33.33	8.33	8.74	1.16	0.16
Meat (gms)	150	37.5	161.62	31.5	3.6
Others (gms)	83.33	20.83	314.39	0.76	21.99
Total			**1930.17**	**78.84**	**40.83**

Source: Author's Calculation from Field Survey, January-February, 2017
Note: Calories in kilograms, protein in grams and also fat in grams

The study has explained the calculation of monthly consumption of various food grains and extracted the calorie, protein and fat from above of each individual in the table number-23 in the previous page. The study used the same NIN's Food Chart for calculating the mainly calories per person per day in the two surveyed villages. The above table explains the calorie, protein, and fat per person per day in Bhitarapadamajhi village and Tikarpadar village of Rayagada district of KBK Region in Odisha.

Table- 5.32: Household Members have fulfilled and not fulfilled the Required Calorie Norms in the Two Sample Villages

Gender	Bhitarapadamajhi Village						
	Adults attained	**The adults do not attain**	**Total**	**Gender**	**Children attained**	**Children do not attain**	**Total**
Male	32 (45.72)	38 (54.28)	70 (48.28)	**Boys**	38 (42.22)	52 (57.78)	90 (46.15)
Female	29 (38.67)	46 (61.33)	75 (51.72)	**Girls**	44 (41.90)	61(58.09)	105 (53.85)
Total	61 (38.62)	84 (61.38)	145	**Total**	82 (42.05)	113 (57.95)	195
Gender	**Tikarpadar Village**						
	Adults attained	**The adults do not attain**	**Total**	**Gender**	**Children attained**	**Children do not attain**	**Total**
Male	18 (37.5)	30 (62.5)	48 (46.15)	**Boys**	28 (36.84)	48 (63.16)	76 (49.35)
Female	19 (33.93)	37 (66.07)	56 (53.85)	**Girls**	26 (33.34)	52 (66.66)	78 (50.65)
Total	37 (35.58)	67 (64.42)	104	**Total**	54 (35.06)	100 (64.94)	154

Source: Author's calculation from Field Survey, January-February, 2017
Note: The figures in the brackets indicate the percent of the Total Population

The above table explains about the household members those able to meet the required calorie norms and those who are not able to meet in Bhitarapadamajhi village. In Bhitarapadamajhi village, the percentage of people attained the calorie, protein, and fat are 45.72 percent male and 38.67 percent female while 42.22 percent boys and 41.90 percent girls have attained calorie norms. On the other side, 54.28 percent males and 61.33 percent females in Bhitarapadamajhi village and 57.78 percent boys, 58.09 percent of girls in Tikarpadar village do not meet calorie norms. And 33.93 percent females and 37.5 percent males are able to attain calorie norms while 33.34 percent girls and 36.84 percent boys are able to attain calorie norms in Bhitarapadamajhi village. The negative side shows 66.07 percent female and 62.5 percent males in Tikarpadar village are not able to meet the required calorie norms. And also, 66.66 percent girls and 63.16 percent of boys in Bhitarapadamajhi village are not able to meet calorie norms. The pathetic and worst situation about the food insecurity in both villages shows the worst reality existing in the district. The first and most important reasons for food insecurity among the tribal people are lack of adequate food grains and lack of buying capacity and also mal-functioning of various welfare schemes.

Table- 5.33: Calculation of Body Mass Index (BMI) of Children in Babjore Village

BMI of Children						
Boys				Girls		
Weight (in Kg)	Height (in Cm)	BMI	Age (Years)	Weight (in Kg)	Height (in Cm)	BMI
21.7	107.8	18.6	4+	18.9	101.7	18.2
24.9	108.2	21.8	5+	20.5	110.6	16.7
24.1	115.9	17.9	6+	23.9	118.9	19.9
30.9	119.9	21.5	7+	26.8	116.8	19.6
29.4	128.8	17.7	8+	25.2	122.6	16.7
36.9	137.5	19.5	9+	33.9	130.5	19.9
40.7	142.9	19.9	10+	37.7	140.9	18.9
44.5	147.6	20.4	11+	40.8	144.7	19.4
41.2	152.7	17.6	12+	43.7	150.6	19.2
51.9	157.4	20.9	13+	45.4	153.9	19.1
54.5	163.5	20.4	14+	46.5	159.8	18.2

Source: Author's calculation from Field Survey, January-February, 2017

The Body Mass Index (BMI) of the World Health Organization is called earlier Quetelet Index. And it is one of the most important measures for showing nutritional status in children and adults. And for calculating the person's weight, it is the weight in kilograms of a person divided by the square of the height of a person (kg/m2). The above table explains the BMI of boys and girls based on the weight and height measurement of the World Health Organization. From the above table, it shows that weight in kg and height in centimetre are measured and the study has calculated the BMI of girls and boys from 4-14 years by using the weight by height measure. Moreover, in the case of boys, the BMI is showing the increasing trend as an increase in height results in increase of body. In the case of girls, the trend is the same. The formula for calculating the BMI is given below.

BMI = Weight in Kilograms/ (Height in Meters)2

Table- 5.34: Calculation of Body Mass Index (BMI) of Adults in Babjore Village

BMI of Adult						
Male				Female		
Weight (in Kg)	Height (in Cm)	BMI	Age (in Years)	Weight (in Kg)	Height (in Cm)	BMI
56.8	168.9	19.9	15-19	47.1	162.2	17.7
59.6	170.5	20.5	20-24	51.2	163.6	19.1
53.4	172.9	17.8	25-29	53.4	164.8	19.6
54.1	173.8	17.9	30-34	55.6	166.7	20.0
62.8	176.9	20.0	35-39	57.5	168.8	20.1
65.5	175.4	21.2	40-44	59.8	169.3	20.8
68.7	177.7	21.7	45-49	62.6	171.5	21.2

Source: Author's calculation Field Survey, January-February 2017 and Author's calculation

The above table explains the Body Mass Index (BMI) of male and female based on the weight and height measurement according to the WHO. The above formula mentioned above is used to calculate the BMI position of both male and female in Babjore village. From the above table, it shows that weight in kg and height in centimetre are measured and we have calculated the BMI of male and female from 15 to 49 years by using the weight by height measure. Moreover, in the case of a male, the BMI is showing the increasing trend as height increased body also increased and followed by the BMI. In the case of a female, the trend is the same as the male.

Table- 5.35: Children and Adult's Nutritional Status in Babjore Village of Balangir District

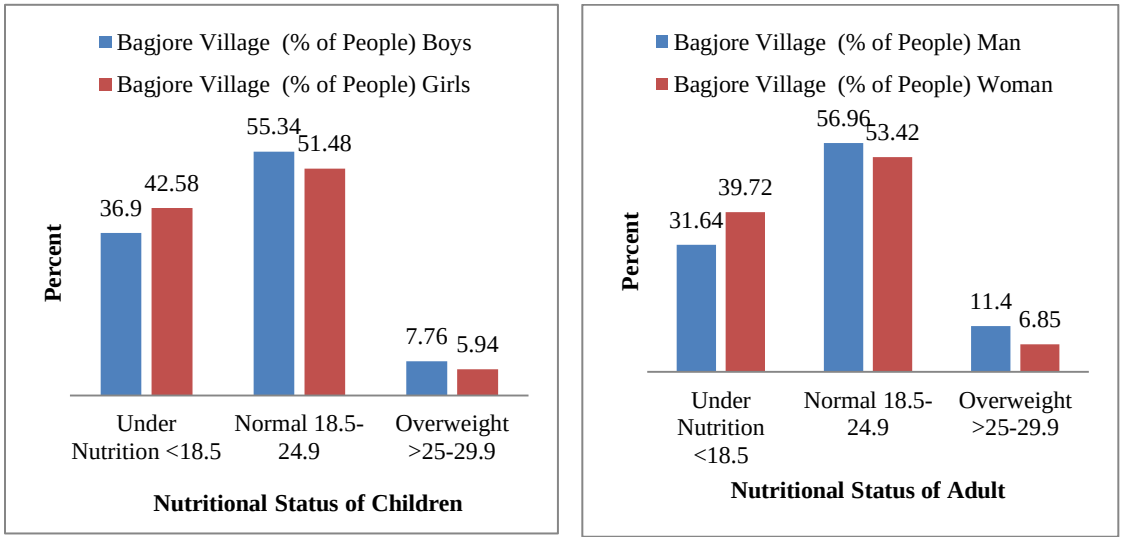
	Bagjore Village (In Percent)					
	Children			**Adult**		
Nutrition Security	**Boys**	**Girls**	**Total**	**Male**	**Female**	**Total**
Under Nutrition <18.5	38 (36.9)	43 (42.58)	81 (39.7)	25 (31.64)	29 (39.72)	54 (35.52)
Normal 18.5-24.9	57 (55.34)	52 (51.48)	109 (53.44)	45 (56.96)	39 (53.42)	84 (55.26)
Overweight >25-29.9	8 (7.76)	6 (5.94)	14 (6.86)	9 (11.4)	5 (6.85)	14 (9.22)
Total	**103 (100)**	**101 (100)**	**204 (100)**	**79 (100)**	**73 (100)**	**152 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Population

The food and nutritional status of a person wholly depend on the right amount of quantity and quality of food grains including the primary health benefits and clean drinking water. That determines the wellbeing of a particular person. The above table explains the percentage of

people including adult male and female and also boys and girls those who are under-nourished, normal and overweight in Babjore village of Balangir district. It shows that, in the case, 36.9 percent boys and 42.58 percent are girls are under nourished but maximum are healthy due to proper and good nutritious food. In the case of adults, 31.64 percent male and 39.72 percent female are under nourished. The broad picture of nutritional status tells that more than 58 percent people including children are normal in the Babjore village of Balangir district of KBK Region in Odisha. The study found that maximum family members are consuming the required amount of food grains and availing the safe drinking water and also getting basic health care facilities that have helped to maintain the food and nutritional status in the sample village. The study also found that the majority of under nourished children and adult are from ST households as they are lacking to access to land and due to low standard of living.

Figure- 5.4: Nutritional Status of Children and Adults in Babjore Village



Source: Author's calculation from Field Survey, January-February 2017
Note: Figures are in Percent

The above two figures discuss the nutritional status of children and adults in the study village. The two figures try to give a clear picture of the nutritional status of both children (boys and girls) and adult (male and female) in Babjore village. It is seen from the first figure, 36.9 percent boys and 42.58 percent girls are undernourished in the surveyed village. Whereas in the case of second figure, 31.64 percent male and 39.72 percent female are undernourished in the same village. That means, 60 percent both boys and girls are in normal health whereas 65

percent male and female are in the same health standard. The whole figure shows that the under-nutrition is high among the girls compared to boys and it is same as in the case of male and female due to various factors like low quantity and quality of food grains, lack of equal distribution of food grains among the family members and lack of health facilities; where the study found that girls are consuming less compared to boys and study has not found any food discrimination among them.

Table- 5.36: Calculation of Body Mass Index (BMI) of Children in Bhitarapadamajhi Village

BMI of Children (Bhitarapadamajhi Village)						
Boys				**Girls**		
Weight (in Kg)	Height (in Cm)	BMI	Age (Years)	Weight (in Kg)	Height (in Cm)	BMI
18.9	104.8	18.1	4+	15.4	104.2	14.1
18.4	110.6	15.0	5+	18.9	101.2	18.6
19.8	117.4	14.4	6+	18.2	116.2	13.5
22.2	123.8	14.5	7+	21.4	122.6	14.3
28.8	124.1	18.7	8+	27.9	123.4	18.3
35.2	134.2	20.0	9+	27.2	133.6	15.3
30.6	139.6	15.8	10+	28.8	138.8	16.0
33.8	143.8	16.4	11+	32.2	142.2	15.9
41.6	150.9	18.4	12+	34.8	149.2	15.7
42.8	156.6	17.5	13+	41.9	150.1	18.5
50.9	157.8	20.4	14+	43.6	157.2	17.7

Source: Author's calculation from Field Survey, January-February, 2017

The Body Mass Index (BMI) of the World Health Organization is called earlier Quetelet Index. And it is one of the most important measures for showing nutritional status in children and adults. And for calculating the person's weight, it is the weight in kilograms of a person divided by the square of the height of a person (kg/m2). The above table explains the Body Mass Index (BMI) of boys and girls based on the weight and height measurement of the World Health Organization. The Formula is, BMI = Weight in Kilograms/ (Height in Meters)2 has been used for measuring BMI of both boys and girls in Bhitarapadamajhi village of Rayagada district. From the above table, it shows that weight in kg and height in centimetre are measured and the study calculated the BMI of girls and boys from 4-14 years by using the weight by height measure. Moreover, in the case of boys, the BMI is showing the increasing trend as both height and body has increased. In the case of girls, the trend is showing the positive trend as the boys.

Table- 5.37: Calculation of Body Mass Index (BMI) of Adult in Bhitarapadamajhi Village

BMI of Adult (Bhitarapadamajhi Village)						
Male				Female		
Weight (in Kg)	Height (in Cm)	BMI	Age (Years)	Weight (in Kg)	Height (in Cm)	BMI
50.2	168.6	17.6	15-19	44.2	162.4	16.8
52.8	170.4	18.1	20-24	45.6	163.8	16.9
60.6	172.2	20.5	25-29	54.8	165.8	20.0
54.2	174.4	17.8	30-34	50.2	168.2	17.7
65.4	175.2	21.3	35-39	59.6	170.6	20.5
56.1	176.6	17.9	40-44	52.3	171.4	17.8
68.2	178.0	21.5	45-49	53,1	172.5	17.9

Source: Author's calculation from Field Survey, January-February, 2017

The above table explains the Body Mass Index (BMI) of male and female based on the weight and height measurement according to the WHO. The above formula mentioned above is used to calculate BMI of both male and female in Bhitarapadamajhi village. From the above table, it shows that weight in kg and height in centimetre are measured, and the study has calculated the BMI of male and female from 15 to 49 years by using the weight by height measure. Moreover, in the case of a male, the BMI is showing the increasing trend as height increased body also increased and followed by the positive BMI. In the case of a female, the trend is the same as the male but the female has the lower BMI compared to male.

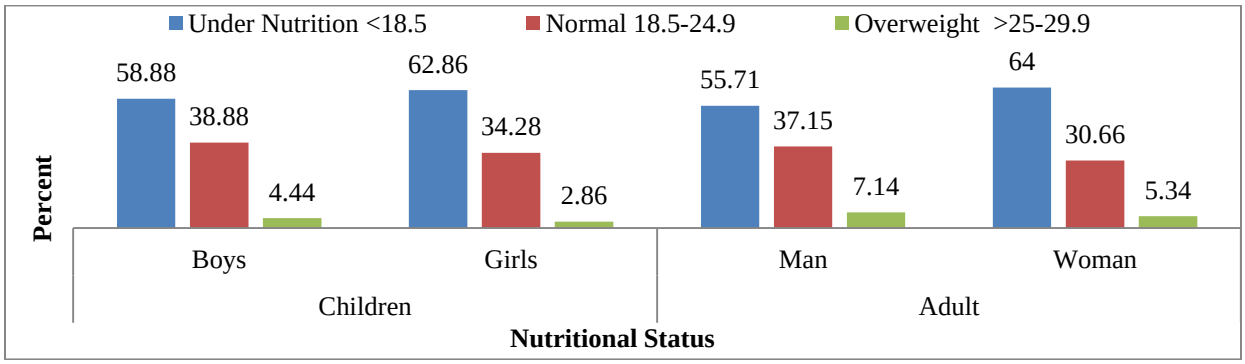
Table- 5.38: Children and Adult's Nutritional Status in Bhitarapadamajhi Village

	Bhitarapadamajhi Village (in Percent)					
	Children			**Adult**		
Nutritional Status	**Boys**	**Girls**	**Total**	**Male**	**Female**	**Total**
Under Nutrition <18.5	53 (58.88)	66 (62.86)	119 (61.02)	39 (55.71)	48 (64)	87 (60)
Normal 18.5-24.9	34 (38.88)	35 (34.28)	69 (35.38)	26 (37.15)	23 (30.66)	49 (33.8)
Overweight >25-29.9	3 (4.44)	4 (2.86)	7 (3.58)	5 (7.14)	4 (5.34)	9 (6.2)
Total	**90 (100)**	**105 (100)**	**195 (100)**	**70 (100)**	**75 (100)**	**145 (100)**

Source: Author's calculation from Field Survey, January-February, 2017
Note: The figures in the brackets indicate the percent of the Total Population

The above table explains the percent of people, including children, are under nourished, normal and overweight in the Bhitarapadamajhi village. It shows that, 58.88 percent boys and 62.86 percent girls are under-nourished. On the other hand, 55.71 percent male and 64 percent female are under nourished. 38.88 percent boys and 34.28 percent girls are healthy while only 37.15 percent male and 30.66 percent female are healthy.

Figure- 5.5: Nutritional Status of Children and Adults in Bhitarapadamajhi Village



Source: Author's calculation from Field Survey, January-February, 2017

Note: Figures are in Percent

The above figure explains the nutritional status of the people in Bhitarapadamajhi village. The blue bar indicates the under nutritional status for boys and adult males, whereas the red bar indicates the normal body for both children and adults (male and female). Under nourishment is high among both girls and females comparison to boys and males. The overall nutritional position of the people including the children is the worst in the sample village. It signifies not only inadequate and less nutritious food consumption of the people but also lack of safe drinking water, sanitation and lack of primary health care facilities. All the above factors have impacted the nutritional status among the poor tribal people in Bhitarapadamajhi village of Rayagada village in KBK Region.

Photos-5.1: Under-nutrition among Children and Adults in Bhitarapadamajhi Village

Source: Field Survey, January-February 2017

The above two photos are an indication of under nourishment among the children and adults in Bhitarapadamajhi village of Rayagada district. The photos depict the under-nutrition amongst the children in the studied village where the thin and lean body of the children is not only due to the inadequate food consumption but also due to superstition, ignorance, lack of awareness, lack of sanitation as well as proper feeding practices and most importantly, the lack of primary health care facilities. The failure of government-sponsored welfare schemes could not bring an end to their misery.

Table- 5.39: Calculation of Body Mass Index (BMI) of Children in Tikarpadar Village

BMI of Children (Tikarpadar Village)						
Boys				Girls		
Weight (in Kg)	Height (in Cm)	BMI	Age (Years)	Weight (in Kg)	Height (in Cm)	BMI
18.9	102.9	18.1	4+	17.8	98.8	18.2
16.2	109.4	13.5	5+	15.2	108.2	13.0
20.8	106.2	18.4	6+	19.9	105.1	18.0
20.0	122.6	13.4	7+	18.5	121.4	12.6
21.7	129.3	12.8	8+	20.4	128.6	12.3
25.1	133.7	14.0	9+	22.0	132.3	12.6
28.2	138.6	14.7	10+	24.3	136.5	13.0
36.9	138.7	19.1	11+	27.8	141.0	14.0
33.4	148.7	15.1	12+	30.6	147.2	14.5
36.3	155.2	15.0	13+	35.9	142.1	18.3
42.9	152.5	18.4	14+	36.2	156.4	14.8

Source: Author's calculation from Field Survey, January-February, 2017

The above table lists the Body Mass Index (BMI) of boys and girls in Tikarpadar village, based on the weight and height measurement of the World Health Organization. The Formula, BMI = Weight in Kilograms/ (Height in Meters)^2 has been used for measuring BMI of both boys and girls in Tikarpadar village of Rayagada district. The above table measures the weight in kg and height in centimetre and the study has calculated the BMI of Girls and boys of the age group 4-14 years by using the weight by height measure. In the case of boys, the BMI is showing an increasing trend, as height increased weight also increased leading to an increasing BMI. In the case of girls, the trend is the same as the boys. However, the majority of boys and girls have low BMI due to poor nutritional status. Moreover, factors like poor income status, lack of education, due to lack of access to safe drinking water, lack of sanitation facilities, inaccessible health facilities are responsible for the low nutritional status.

Table- 5.40: Calculation of Body Mass Index (BMI) of Adults in Tikarpadar Village

BMI of Adults (Tikarpadar Village)						
Male				Female		
Weight (in Kg)	Height (in Cm)	BMI	Age (Years)	Weight (in Kg)	Height (in Cm)	BMI
48.3	167.4	17.4	15-19	44.1	161.2	17.0
50.6	169.2	17.7	20-24	46.2	162.4	17.6
59.4	171.3	20.2	25-29	52.3	164.3	19.4
52.5	173.5	17.5	30-34	49.4	167.1	17.7
62.7	176.8	20.0	35-39	56.4	168.8	19.8
54.2	175.3	17.6	40-44	51.9	170.5	17.8
66.0	177.1	21.0	45-49	53.4	172.6	17.9

Source: Author's calculation from Field Survey, January-February, 2017

The above table lists the Body Mass Index (BMI) of adult males and females based on the weight and height measurement as per the WHO Formula. And the formula mentioned above is used to calculate the BMI position of both males and females in Tikarpadar village. The above table shows weight in kg and height in centimeter and the study has calculated the BMI of male and female from 15 to 49 years by using the weight by height measure. In the case of a male, the BMI is showing an increasing trend as height increased weight also increased, except for the 30-34 year age group. In the case of a female, the trend is the same as the male. And the overall nutritional scenario of male and female is negative due to their low weight compared to height and age. The important factors like physical activity, socio-economic position, rurality, T.V. use, changing dietary pattern among the people, decline of quality of food grains and drinking water are mostly responsible for low BMI in the sample village of Rayagada district of KBK Region in Odisha. The importance of the nutritional status of women and men is very important for any society.

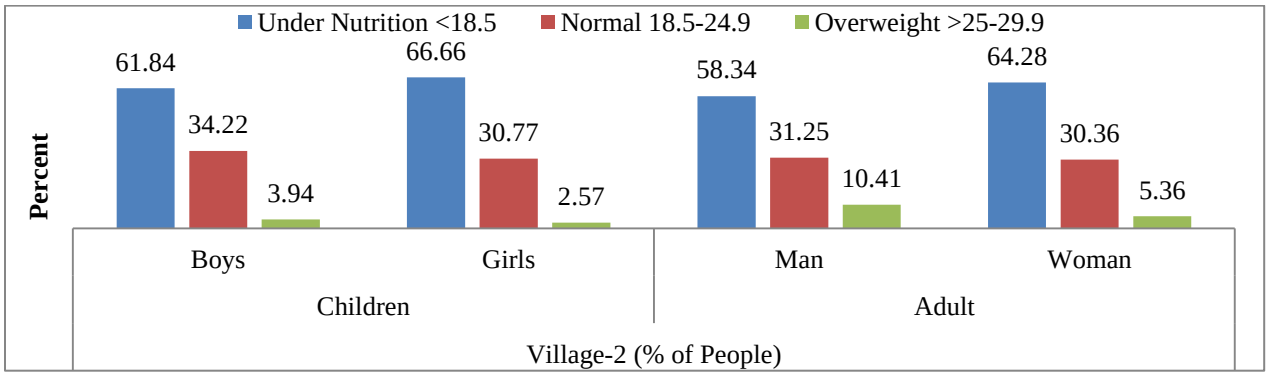
Table- 5.41: Children and Adult's Nutritional Status in Tikarpadar Village

	Tikarpadar Village (in Percent)					
	Children			**Adult**		
Nutrition Security	**Boys**	**Girls**	**Total**	**Male**	**Female**	**Total**
Under Nutrition <18.5	47 (61.84)	52 (66.66)	99 (64.29)	28 (58.34)	36 (64.28)	64 (61.54)
Normal 18.5-24.9	26 (34.22)	24 (30.77)	50 (32.46)	15 (31.25)	17 (30.36)	32 (30.76)
Overweight >25-29.9	3 (3.94)	2 (2.57)	5 (3.25)	5 (10.41)	3 (5.36)	8 (7.7)
Total	**76 (100)**	**78 (100)**	**154 (100)**	**48 (100)**	**56 (100)**	**104 (100)**

Source: Author's calculation from Field Survey, January-February, 2017
Note: The figures in the brackets indicate the percent of the Total Population

The above table explains the nutritional status among both children and adult in Tikarpadar village of Rayagada district. The figure shows that, 61.84 percent boys and 66.66 percent girls are under nourished and 34.22 percent boys and 30.77 percent girls are healthy. Furthermore, under nourishment is high among the females (64.28) percent compared to males (58.34) percent counterpart. Additionally, around 31 percent of females and males are in normal condition, and there is not much obesity among the tribal people in the village.

Figure- 5.6: Nutritional Status of Children and Adults in Tikarpadar Village



Source: Author's calculation from Field Survey, January-February, 2017
Note: Figures are in Percent

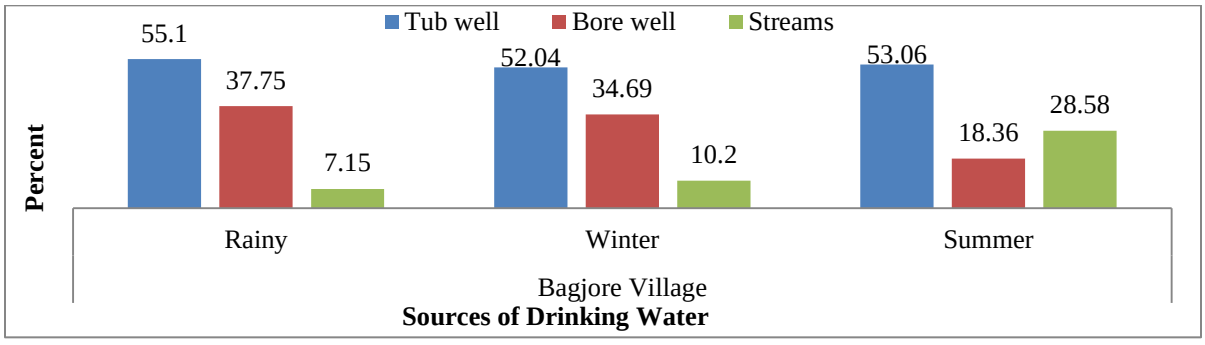
The above figure explains the percent of people including children those are suffering from under nutrition in Tikarpadar village. From the figure, the blue color bar represents the percent of under nutrition; the red bar represents the healthy and green bar represents the overweight. From the figure, under nutrition is very high among both children and adults due to various socio-economic and health factors. In other words, girls and adult females under nutrition are high compared to the boys and males due to less consumption of food grains by the female members in a particular household. Other factors like biological reasons, consumption of unhygienic foods and lack of adequate health services seem to influence under nutrition in the Tikarpadar village.

Photo- 5.2: Under-nutrition among Children and Adults in Tikarpadar Village

Source: Field Survey, January and February 2017

The above photos depict the under-nutrition among the children and adults in the study village. The photos are of a few children and a woman looking visibly thin and pale. The lack of adequate food grains and poor quality of foodgrains in their household signifies that they are unable to take three squares meal in a day; leave alone the nutritious food and apart from that, there is no access to safe drinking water, no sanitation facilities, lack of proper feeding practices, lack of hygienic food and no nutritious food at all. Moreover, they mostly consume rice, mandia, various roots, mango kernel, and green leaves most of the time in the day to day consumption. This leads to under nutrition among the poor tribal people in the village.

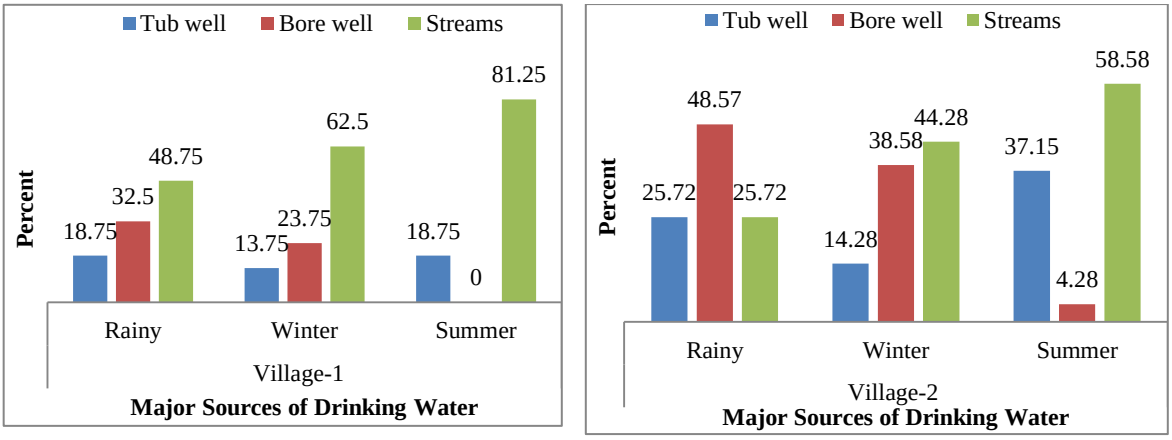
Figure- 5.7: Major Sources of Drinking Water in Babjore Village of Balangir District



Source: Author's calculation from Field Survey, January-February, 2017
Note: Figures are in Percent

The above bar diagram tells about the sources of drinking water facilities in three different seasons in the studied village of the Balangir District. It shows that maximum people depend on tubewell and borewell for drinking water purposes in three seasons. There is no tap water facility in that village. Furthermore, households sometimes draw water from streams and pond, particularly in the summer seasons due to various reasons. It shows that majority of households draw water from the tube-well in all three seasons as it is the main source of drinking water where more than 52 percent households depends on tube-well followed by dependence on borewell. In other words, safe and clean drinking water is very much essential for food digestion and growth. The overall condition of safe drinking water is good in the Babjore village of Balangir district.

Figure- 5.8: Major Sources of Drinking Water in the Two Sample Villages of Rayagada District



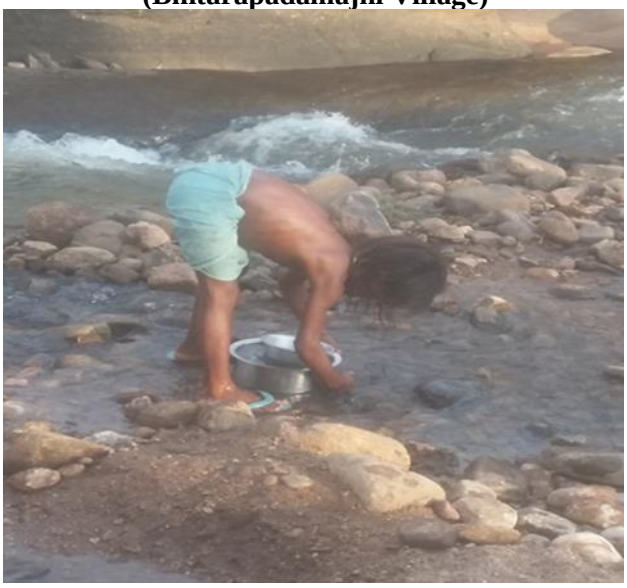
Source: Author's calculation from Field Survey, January-February, 2017
Note: Figures are in Percent

Safe and clean drinking water is very much needed for each human being to survive on this Earth. Without water, there is no life and growth, and would lead to non-existence of human beings. Therefore, clean drinking water is extremely essential for nutrition security of a person. The nutritional security can never be achieved without clean drinking water in society. The left side and right side figures explain the major sources of drinking water of the households in Bhitarapadamajhi and Tikarpadar village. It describes that the maximum households depend on the stream water for their daily use followed by borewell and tubewell water in all three seasons. In the rain, winter and summer seasons, 48.75 percent, 62.5 percent and 81.85 percent households depend on stream water respectively. Maximum households rely on stream water due to unavailability of water from various sources like ponds and tubewell, as water gets dried up

after the winter season in Bhitarapadamajhi village. In the case of Tikarpadar village, 48.57 percent households depend on borewell water in the rainy season followed by dependence on stream water in the winter season (44.28 percent) and 58.58 percent population depends on stream water in the summer season. Mainly, majority of the households depend on stream water for various purposes throughout the year in the two villages of Rayagada district in KBK Region.

Photo- 5.3: Major Sources of Drinking Water in the two Villages of Rayagada District

(Bhitarapadamajhi Village) **(Tikarpadar Village)**



Source: Field Survey, January-February 2017

As mentioned above, safe and clean drinking water is extremely essential for food and nutrition security. The above photos depict the scarcity of drinking water in Bhitarapadamajhi and Tikarpadar village of Rayagada district. The drinking water facility is better in Tikarpadar village compared to Bhitarapadamajhi village. As the Tikarpadar village has multiple drinking water sources. The functioning of borewell and tubewell varies from season to season. They mostly depend on tubewell and stream for various uses from bathing to cooking purposes. The above photo shows a tribal girl collecting drinking water from a stream in Bhitarapadamajhi village while a woman and children are returning after collecting drinking water from a stream near Tikarpadar in the Kashipur block of Rayagada district. There is a water shortage in those two villages. They are deprived of safe drinking water facilities in their villages. They mostly depend on the stream water for drinking purpose after the rainy season. The borewell and tubewell are dried up in the summer season which results in the drinking water problem in the

sample villages. Moreover, lack of safe and clean drinking water has affected the food and nutritional status of the people in both villages of Rayagada district in KBK Region of Odisha.

Table- 5.42: Factors Determining the Absorption Status in the Sample Villages of Two Districts

Factors	Balangir District (% of H.Hs having Facilities)	Rayagada District (% of H.Hs having Facilities)		
	Bagjore Village	**Bhitarapadamajhi**	**Tikarpadar**	**Total**
Having Safe Drinking Water	32 (32.65)	11 (13.75)	7 (10)	18 (12)
Accessing PHCs	21 (21.43)	7 (8.75)	6 (8.58)	13 (8.66)
Having Toilet Facilities	20 (20.4)	6 (7.5)	3 (4.28)	9 (6)
Do not have any Facilities	25 (25.52)	56 (70)	54 (77.15)	110 (73.34)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Households
No. H.Hs indicate the Number of Households

The above table explains the factors determining the absorption status in three villages of two districts of KBK Region. The table tells that only 32.65 percent households are having access to safe drinking water, 21.43 percent households have access to the PHCs, 20.4 percent have the toilet facilities and 25.52 percent household members do not have any of these above facilities in Babjore village of Balangir district. The overall factors that determine absorption status is good in that village. In Bhitarapadamajhi village 13.75 percent households have access to safe drinking water, 8.75 percent households are using the PHCs, only 7.5 percent have the toilet facilities, and 70 percent household members do not have any of these above facilities in Bhitarapadamajhi village. In the case of the Tikarpadar village, where only 10 percent households have access to safe drinking water, 8.58 percent households are using the PHCs, only 4.28 percent has the toilet facilities, and gravely, 77.15 percent households member do not have access to any facility. The broad picture of all the three villages describes that absorption status of selected village in Balangir district is far better than the selected villages of Rayagada district in the KBK Region. This can be said on the basis of the availability of factors like safe drinking water facilities, better health care facilities, and people having access to toilet facilities.

Table-5.43: Precautions taken by Pregnant Women for Last One Year in the Sample Villages

Nature of Precaution	Balangir District- % of Precaution Taken	Rayagada District- % of Precaution Taken		
	Babjore Village	Bhitarapadamajhi	Tikarpadar	Total
Food Supplements	9 (26.47)	3 (9.38)	2 (7.7)	5 (8.62)
Immunization	8 (23.53)	5 (15.62)	3 (11.45)	8 (13.8)
Anti-natal Check-up	7 (20.59)	2 (6.25)	1 (3.85)	3 (5.18)
Not taken	10 (29.41)	22 (68.75)	20 (76.93)	42 (72.42)
Total	**34 (100)**	**22 (100)**	**26 (100)**	**58 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of Total Women

The above table describes the precautions taken by the pregnant women for the last one year in the three districts of studied villages. It shows that 26.47 percent women have used food supplements, 23.53 percent women have taken immunization, 20.59 percent women have undergone an anti-natal check-up but a higher percentage of women (29.41%) have not taken anything at all in the Babjore village of Balangir district. On the other side, in the Bhitarapadamajhi village, 3.38 percent women have used food supplements, 16.62 percent women have taken immunization, 6.25 percent women have undergone an anti-natal check-up, and significant 68.75 percent women have never taken anything at all. Whereas in the case of Tikarpadar village, 7.7 percent women have used food supplements, 15.38 percent women have taken immunization, 3.85 percent women have undergone an anti-natal check-up and 76.93 percent women have not taken anything at all. Lack of AWCs, lack of awareness, superstition, the old way of living, poor hygienic condition are responsible for low health condition of women in both areas of Rayagada district.

Table- 5.44: Immunization among Children below Fourteen Years Old in Babjore Village

Vaccines	Bagjore Village (% of Children)		
	Boys	Girls	Total
Polio	51 (49.52)	44 (43.56)	95 (46.57)
Others	19 (18.45)	18 (17.82)	37 (18.14)
Did not take	33 (32.03)	39 (38.62)	72 (35.29)
Total	**103 (100)**	**101 (100)**	**204 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Others like DPT, Hepatitis Vaccines
Note: The figures in the brackets indicate the percent of Total Children

The above village tells about the immunization among the children below fourteen years of age in the surveyed village of the district. There vaccines like DPT, polio, and others are given to the children for their better health, and these are the vaccines to be given in the initial years to children to protect them from various health complications, particularly in the most backward areas of the state. The table 5.44 shows 49.52 percent of boys received polio, 43.56 percent of girls received polio, 19.85 percent boys and 17.82 percent of girls received the vaccines provided by the health workers. More importantly, there are 35.29 percent of girls, and 32.03 percent of boys have not received any vaccines in Babjore village of Balangir district.

Table- 5.45: Immunization among Children below Fourteen Years Old in the Two Sample Villages

Vaccines	Village-1 (% of Children)		Village-2 (% of Children)		Total (% of Children)	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
Polio	23 (25.55)	19 (18.09)	15 (19.74)	13 (16.66)	38 (22.9)	32 (17.48)
Others	5 (5.56)	8 (7.62)	7 (9.22)	6 (7.7)	12 (7.22)	14 (7.65)
Don't take	62 (68.89)	78 (74.28)	54 (71.05)	59 (75.64)	116 (69.88)	137 (74.86)
Total	**90 (100)**	**105 (100)**	**76 (100)**	**78 (100)**	**166 (100)**	**183 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of children in Total Children

The above table tells about the immunization situation among the children below fourteen years of age in the studied villages of the Rayagada district. In both villages, no DPT vaccines are given to the boys or girls in the Rayagada district. By and large, 25.55 percent of boys received polio vaccines in comparison to 18.09 percent of girls and no hepatitis-b vaccines are given to either boys or girls. 5.56 percent of boys and 7.62 percent of girls received the vaccines provided by the health workers and more importantly, 68.89 percent of boys and 74.28 percent of girls have not received any vaccines at all in the first village. Regarding the second village, it tells that, only 19.74 percent of boys received polio vaccines whereas only 13.66 percent of girls received it. There are no hepatitis-b vaccines given to the boys or girls, 9.22 percent of boys and 7.7 percent of girls received the vaccines provided by the health workers. It was found that 71.05 percent boys and 75.64 percent girls have not received any vaccines at all. The health care facilities are extremely bad in the two villages of Rayagada district of KBK Region in Odisha.

Table- 5.46: Children (3-6 years) receive Health Care Facilities at AWCs in the Sample Villages of Two Districts

Village	Children 3-6 Years of Age			Children Benefited		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
Bagjore Village	38 (54.28)	32 (45.72)	70	27 (71.05)	20 (62.5)	47 (67.15)
Villages	**Children 3-6 years of age**			**Children Benefited**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
Village-1	21 (46.66)	24 (53.34)	45	12 (57.15)	10 (41.66)	22 (48.88)
Village-2	17 (43.58)	22 (56.42)	39	9 (52.94)	12 (45.55)	21 (53.84)
Total	**38 (45.24)**	**46 (54.76)**	**84**	**21 (55.26)**	**22 (47.82)**	**43 (51.2)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of Total Children

The above table explains about the children (3 to 6 years of age) receiving health care facilities in AWCs in the sample villages of two districts in the KBK Region. It shows that, 71.05 percent of boys and 62.5 percent girls are receiving health care facilities in Anganwadi centers. Very few children have not received any benefits from the AWCs due to various reasons in the sample village of the district. The study found that maximum ST children have not availed the services in the state due to factors like far flung areas, lack of communication, lack of awareness and superstition. In comparison, 57.15 percent of boys and 41.66 percent of girls received health facilities in Bhitarapadamajhi village. 45.55 percent girls and 52.94 percent boys have received health care facilities in the Anganwadi Centres in Tikarpadar village of Rayagada district. The aggregate status of the two villages describe that more than 55 percent of boys and more than 43 percent of girls benefited from the centres. And still 50 percent both boys and girls are not enjoying the benefits. The study found that the maximum deprived children are from ST households.

Table- 5.47: Children (5-15 Years) In-school and Out-of-school in Babjore Village

Age Groups	Bagjore Village (Balangir District)					
	Total Children		**Children in School**		**Children out of the School**	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
5-10	42 (40.78)	38 (37.62)	32 (76.2)	25 (65.78)	10 (23.8)	13 (34.22)
10-15	61 (59.22)	63 (62.38)	53 (86.88)	45 (71.42)	8 (13.12)	18 (28.58)
Total	**103 (100)**	**101 (100)**	**(100)**	**25 (100)**	**76 (100)**	**99 (100)**

Source: Author's Calculation from Field Survey, January-February, 2017
Note: The figures in the brackets indicate the Percent of the Total children

The importance and value of education occupies an important place in society, and it plays a significant role in human life. Without education, no society or human being can make progress. Here the study explains the school dropout ratio in the studied village. The above table describes the percentage of children (5-15 years of age) in school and out of school in Babjore village of Balangir district. It shows that, 76.2 percent boys and 65.78 percent girls in (5-10 years of age) are in school while in the case of 10-15 age groups, 86.88 percent boys and 71.42 percent girls are in school. In the case of children out of school, it shows that 23.8 percent boys and 34.22 percent girls are out of school in 5-10 years age group, while 13.12 percent boys and 28.58 percent girls are out of school in the age group of 10-15 years in the study village. And the drop out ratio is higher among the girls in comparison to boys in both age groups in the surveyed village of Balangir district.

Table- 5.48: Children (5-15 years) In-School and Out-of-School in the Two Sample Villages

Age Groups	Bhitarapadamajhi Village (Rayagada District)					
	Total Children		Children in School		Children out of School	
	Boys	Girls	Boys	Girls	Boys	Girls
5-10	25 (48.07)	27 (45.76)	9 (36)	8 (29.62)	16 (64)	19 (70.38)
10-15	27 (51.93)	32 (54.24)	10 (37.03)	9 (28.12)	17 (62.97)	23 (71.88)
Total	**52 (100)**	**59 (100)**	**19 (100)**	**17 (100)**	**33 (100)**	**42 (100)**
Age Groups	**Tikarpadar Village (Rayagada District)**					
	Total Children		**Children in School**		**Children out of School**	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
5-10	38 (34.55)	50 (40)	12 (31.58)	16 (32)	26 (68.42)	34 (68)
10-15	72 (65.45)	75 (60)	23 (31.95)	12 (16)	49 (68.05)	63 (84)
Total	**55 (100)**	**56 (100)**	**35 (100)**	**28 (100)**	**75 (100)**	**97 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total children

The above table explains about the children (5-15 years of age) in school and out of school in the sample village. It shows that 64 percent of boys and 70.38 percent of girls are out of school in the 5-10 year age group, but in the case of 10-15 years, 62.97 percent of boys and 71.88 percent of girls are out of school in Bhitarapadamajhi village of Rayagada district. In Tikarpadar, 68.42 percent of boys and 68 percent of girls (5-10 years age group) are out of the school. While for the 10-15 year age group, 68.05 percent of boys and 84 percent of girls are out

of school in that village. The overall educational status of the school children is very low in both the villages of Rayagada district. In other words, the factors like lack of motivation among the tribal people, lack of awareness among them, lack of adequate schools and teaching facilities are the major obstacles.

Table- 5.49: Livestock owned by Households in the Sample Villages of Two Districts

	Balangir District	**Rayagada District**		
Livestock owned by Households	**Bagjore Village**	**Bhitarapadamajhi**	**Tikarpadar**	**Total**
Goats/sheep	18 (18.36)	33 (46.25)	31 (44.28)	64 (42.66)
Hens/ducks	15 (15.3)	11 (13.75)	10 (14.28)	21 (14)
Cows	22 (22.45)	22 (27.5)	19 (27.15)	41 (27.33)
Buffalos	13 (13.26)	3 (3.75)	3 (4.28)	6 (4)
Others	9 (9.18)	4 (5)	2 (2.85)	6 (4)
Do not own	19 (19.38)	7 (8.75)	5 (7.15)	12 (8)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: Figures in the brackets indicate the percent of the Total Households

The above table explains the livestock owned by the households in the sample villages of two districts in the KBK Region. The livestock is one of the most important sources of livelihood to any household in society. It provides both income and meat to the households in the two villages. The above table shows that 18.36 percent households owned goat/sheep, followed by 15.3 percent households owning hen/duck, 22.45 percent households owned cows, 13.26 percent households owned buffalos, 9.18 percent housed owned other animals, and 19.38 percent households did not own any live stock in the Babjore village. In Bhitarapadamajhi Village, it shows that 46.25 percent households owned goat/sheep followed by 13.75 percent households owning hen/duck, 27.5 percent households owned cows, 3.75 percent households owned buffalos, 5 percent housed owned other animals, and 8.75 percent households have not owned any live stocks in the first village. In the case of the other village, it shows that 48.28 percent households owned goat/sheep followed by 14.28 percent households owning hen/duck, 27.15 percent households owned cows, 4.28 percent households owned buffalos, 2.85 percent housed owned other animals, and 7.15 percent households did not own any livestock.

Table- 5.50: Structure of Houses of the Households in the Sample Villages of Two Districts

	Balangir District	Rayagada District		
Type of Houses	**Babjore Village (No. of H. Hs)**	**Village-1 (No. of H.Hs)**	**Village-2 (No. of H.Hs)**	**Total**
Concrete	19 (19.38)	1 (1.25)	1 (1.42)	2 (1.34)
Tiled	33 (33.38)	3(3.75)	1 (1.42)	4 (2.66)
Asbestos	21 (21.42)	7 (8.75)	5 (2.15)	12 (8.8)
Thatched	14 (14.28)	35 (43.75)	32 (45.72)	67 (44.66)
Huts	11 (11.22)	34 (42.5)	31(44.28)	65 (43.34)
Total	**98 (100)**	**80 (100)**	**70 (100)**	**150 (100)**

Source: Author's calculation from Field Survey, January-February 2017
Note: The figures in the brackets indicate the percent of the Total Households

The above table explains the type of house of the households in the sample villages of Balangir and Rayagada districts. Households possess various types of houses like concrete, tile, asbestos, thatched houses and huts in the villages. The figure are as follows, 19.38 percent households are having concrete houses followed by 33.38 percent households having a tiled house, 21.42 percent households have an asbestos house, 14.28 percent households have a thatched house, and 11.22 percent households have huts in the Babjore village. In Bhitarapadamajhi village, 1.25 percent families are having concrete houses followed by 3.75 percent households having the tile house, 8.75 percent households have an asbestos house, 43.75 percent households have a thatched house, and 42.5 percent households have huts. In the case of Tikarapdar village, 1.25 percent households are having concrete house followed by 3.75 percent households having a tile house, 8.75 percent households have an asbestos house, 43.75 percent households have a thatched house and 42.5 percent households have huts.

The following photos are an indication of the kind and structure of houses in the two villages where the poor tribal household members live. As the study mentioned, maximum households have huts for living. The condition is very bad and a tiny house has to accommodate all the family members. The above two houses are made of mud and woods; they are infirm and can't be described as a suitable place for living. As it is mentioned above, the housing condition describes the socio-economic parameters of good economic status of any household in society. None of the households got the benefits of Indira Awas Yojana and Biju Pakka House in the surveyed village. The governments and administration have failed to provide the house to the poor tribal people in Rayagada district of KBK Region in the state.

Photos- 5.4: Structure of the Houses in the Two Villages of Rayagada District

(Bhitarapadamajhi Village) **(Tikarpadar Village)**

Source: Field Survey, January-February, 2017

To sum up, the status of food and nutrition security of the people and also the socio-economic condition in the three villages of the two districts in the KBK Region give an idea about the overall living standard and health status. The Babjore village of Balangir district gave a very clear picture of the overall indicators of food and nutrition security. The socio-economic status of the sample village is good due to better access to land, market, high purchasing power due to migration and employment opportunities, well-functioning of various welfare schemes and it has impacted the improvement in overall nutrition security among the family members. The status of both food and nutrition security has improved due to better access to PDS, ICDS, MDM and clean drinking water in the Babjore village. However, there are few households among the ST communities which lack access to basic amenities due to various factors. Thus, much more need to be done for their improvement to improve the overall standard of living in that village.

Unscrupulous food and nutrition security in the Rayagada district leads to starvation and undernourishment, which causes deaths. Moreover, the socio-economic status of the Bhitarapadamajhi and Tikarpadar village is very poor due to low land holdings, lack of irrigation facilities resulting in low production and availability of food grains. There is low purchasing

power among the people due to lack of employment opportunities. These factors led to a low standard of living among the households in both the villages. Furthermore, there are both non-existence and malfunctioning of welfare schemes like PDS, MGNREGA, ICDS, MDM, and basic primary health care facilities. Furthermore, because of the problems mentioned above, more than 60 percent of people, including children suffer from both food and nutrition insecurity. In addition to that, deforestation and restriction of forest rights of the tribal people lead to the additional burden on the status of food and nutrition security of the tribal people in both the villages. The research particularly focused and highlighted the problem of food and nutritional security of the tribal people in Bhitarapadamajhi and Tikarpadar villages of Rayagada district, as they mostly suffer from under nutrition and hunger because of the shortage of food and low buying capacity as well as lack of clean drinking water facilities and basic health benefits. The study gives the whole narrative of food insecurity status of tribal people in the two villages of Rayagada district of KBK Region in Odisha.

Few Case Study Reports from the Two Villages of Rayagada District

One woman respondent of Bhitarapadamajhi village- a Jhodia tribal old woman in her late 60s is very much concerned about the loss of cultivated harvests to climate change and limited access to the forest. And she affirms that she and her family members have gone through hunger for last few years due to deforestation in their areas. Another tribal man respondent in the Bhitarapadamajhi village said he is facing a shortage of food for the last few years due to loss of livelihood and lack of employment opportunities and is unable to feed his family members. Furthermore, they are skipping meals for a stretch of days due to shortage of food grains and are able to eat only *mahul*, *kendu*, and tamarind and mango kernel for day to day survival in the rainy season. Another woman shared her story about facing and combating hunger during the shortage of food particularly in summer and rainy seasons. According to another woman respondent of Tikarpadar village, their family members faced food shortage mostly during the rainy season and in order to avoid and mitigate the hunger pang, they collect various types of forest products like edible oil, honey, insects, amla, mushrooms, custard apple, tender bamboo shoots, and several kinds of leaves after the rainy season but that is not sufficient for filling their stomach. Another villager, Biswanath Sarakka of Bhitarapadamajhi explained and shared his coping strategy during the time of food shortage and hunger; they collect different roots, bamboo

shoots, *bel*, tubers, and many tubers from the forest during the rainy season in order to sustain their life and few of his family members migrate to the far-flung areas for employment opportunities.

5.5.1: Food Habits of the Tribal People in the Sample Villages

The tribal populations are indigenous in composition, smaller in size and have a traditional and subsistence economy based on the wages, forest, and shifting cultivation (*Podu Chasa* called in the tribal language) in the state. Their life and livelihoods depend mostly on the forest. This research study conducted a survey to know about the traditional foods and food habits of tribal people, present dietary pattern and major food combinations of tribal diet in Balangir and Rayagada districts of the state. It is perceived that tribal households have some traditional foods and food habits which are very much needed to the nutritional security for them, for example; eating various roots, leaves, mango, different fruits and other forest-based products (Mishra, 2007). Conventionally finger millet locally known as *mandia* was the main food of tribal households, but after the introduction of PDS rice, they are also consuming rice in various forms (Fernandes and Menon, 1987). The *mandia* and rice are the main staple food of tribals at present in the study area, and it has a great source of potassium, minerals, and calcium, that helps the young children develop. Consumption of total staple food makes expectant and lactating women strong and healthy, but due to changing in consumption pattern they are consuming less of total staple food in recent times. Apart from that, they are very fond of non-vegetarian food, and most of the tribals were non-vegetarians, as they live in the hilly and forest areas. They go hunting more often and collect various type of flesh (Roy, 1993). Furthermore, it provides more calorie, protein, and fat to the tribal people. They consume pork, rat meat, chicken, sheep, egg, meat, and fish, goat and various birds (76 percent households). However, the current study found that, due to deforestation and lot of restriction on forest rights of the tribal people, they are losing the forest products and services. It has reduced their consumption of forest product and impacted food security status of the indigenous poor people in the two villages of Rayagada district.

Table- 5.51: Daily Food Intake of Tribal People in the Sample Villages

Major Food Items	Varieties of Food Items	Cooked Food Items
Cereals and Millets	Boiled rice and water rice (*Pakhal*)	Cooked by boiling with water
	Mandia	Chilka dambu-dough it is the liquid type of food with boiling water
	Maize	Roti, bhat is prepared by boiling maize in the water
Pulses	Black gram and red gram	Dal is prepared by boiling water with salt and turmeric
Roots and Tubers	Potato, sweet potato, radish, the different roots	Generally eaten and curry is being by boiled and fried with salt, oil and traditional spices
Leafy Vegetables	Spinach, cabbage, sajana leaves, coriander leaves, and other leaves	Chopped leaves are boiled and fried with salt, turmeric powder, green chili and oil
Varieties of Vegetables	Pumpkin, brinjal, tomato, mushroom, and other vegetables	Different curry is prepared with oil and spices
Variety of Fruits	Variety of mango, jackfruits, jamun, guava and other traditional Fruits	They consume directly, and also they make different pickle out of that
Different Meat	Rat, wild boar, wild hen, pig, goat, red meat, red ant, fishes, different birds, and egg	Fleshes are fried and boiled with water, oil, and a variety of spices
Fats and Oil	Custard oil, niger and mahua oil	It is commonly used for cooking purposes
Wine and Beverages	*Handia* and local wine	*Handia* is prepared out of rice with mahua flower, and other ingredients and wine is bought from local shops

Sources: Field Survey, January-February 2017

Photos-5.5: *Ambasada* (Mango Cake) and *Amba Koili* (Mango Kernel) are eaten by the Tribal People in the Sample Villages of Rayagada District

Source: Field Survey, January-February, 2017

The tribal people give more importance to the traditional foods which are eaten by their previous generations such as dry mango juice, and mango kernels. Mangoes are the most sought-after fruits apart from other fruits eaten by the people in the sample villages of the study area. This fruit is easily available in their area. The above two photos are of mango juice, and of mango kernel which is dried in the sun for rainy and winter season consumption when rice and mandia are finished. They are stored for those seasons when there will be no food at all. The tribal people store these foods for future consumption when there is unavailability and shortage of food grains. It is unhygienic to consume the mango kernels and could have a harmful impact on health but in spite of that, their situation compels them to eat that. It will lead to poor health and malnutrition of the tribal villagers.

5.5.2: Meal Pattern among the Household Members in the Sample Villages

Food is the basic need of a human being, and it helps in the body's growth, maintenance, renewal of body tissues and regulation of the body processes. Furthermore, food has been inter - woven with the physical, social, economic, psychological and intellectual life of a human being. Therefore, it is a part of human culture and is filled with many different meanings and symbolism for all individuals. The environment, which includes the physical, psychological and social setting related to the culture of a group, plays an important part in determining the food pattern (Manay and Shadksharaswamy, 2000). And the meal pattern among the tribal people is not very much different from the other social groups in the state. Moreover, most of the people consume food three times a day - breakfast, lunch, and dinner. The study found out that the tribal people also tries to consume food three times food a day. The below table has explained the meal pattern among the tribal households in the studied area of the sample district.

Table-5.52: Meals Pattern of Tribal People in the Sample Villages

Different Meals are taken	Different Food Items	The Amount of Food eaten by the Tribal Persons in Sample Villages
Breakfast	Water Rice Or *Pakhal* in Odia language	60-80 grams
Lunch	Rice	80-90 grams
	Dal	30 grams
	Vegetables	20 grams
	Mandia	40 grams
	Egg, Meat, and Fishes	45 grams
Dinner	Rice	60-80 grams
	Vegetables	15 grams
	Mandia	40 grams

Sources: Filed Survey, January-February 2017

The above food chart discusses the meal pattern of the tribal households in two districts of KBK Region in the state. They eat three times in a day. In other words, they eat mostly pakhal (watered rice) for breakfast (about 60-80 grams per head). The study has not found out any variety of dishes in their lunch. They eat mostly rice and *Mandia* along with one curry and sometimes dal about 160 grams. They also take different meat throughout the year. Furthermore, they eat mostly rice and *Mandia* in the night along with one curry about 120 grams per head.

5.6. Intra-households Food Distribution among the Households Members in the Study Area

Intra-household food distribution has great importance in determining the food security status of a particular family. In a household, there are various factors such as seasonal food shortages, income level of the family, household reactions and seasonal variation in food availability that can influence the intra-household food distribution in the society. Moreover, seasonal variation in food grain availability does not affect equally every member of a family. In a household, there are few members who are food insecure due to shortage of food (mainly females), while other members are food secure, the reason being biasedness towards the male child in the society (Gopaldas et. al. 1983; Hassan and Ahmad, 1984). Pinstrup-Andersen, (2009) mentioned that, providing food security and nutritional status to the family members have created problems in the intra-household food distribution and also problems in accessing food in the developing nations of the world. Furthermore, the above issues have brought a lot of development

practitioner, policymakers and others regarding the unequal food distribution or allocation within the households in the society.

Hadleya et. al. (2008) interpreted that, nutrient intake deficiencies and undernourishment among the family members arise due to inequality in the allocation of food grains within households in most of the developing countries. In other words, uneven allocation of food among the family members within a household is one of the most significant reasons for promoting and increasing undernourishment in our country. Subsequently, the present research has tried to look into the patterns of food allocation and levels of calorie intake among the tribal people in the surveyed villages of the two districts in KBK Region of Odisha. The study has found out that, there is biasness towards the male over the females in the case of distribution and sharing food within the tribal households in the surveyed villages of two districts. The study also found that, relative allocation of food is determined considerably by the factors like household production, level of household income, customary practice and gender-cum-age in the studied villages of two districts.

5.6.1. Tribal People's Perception of Food Security in the Study Area

The leading researchers like Tagade (2012), Tripathy (2016), Biswas (2010), and Jena (2008) mentioned that, people's perception on food security does not essentially tally with the scientific concept of food security in the society. In other words, in a constantly changing environment, people's experiences help to shape up their understanding and analysis of food security. Local differences can also be noted. In the studied areas, male members told that irregular and casual works lead to the very merge income and putting them into the problem of food insecurity. The study found out that food consumption and food supply are severely affected by various prominent factors like low agricultural production due to lack of access to land especially fertile land, climate change, seasonal agriculture, lack of purchasing power, deforestation, and most importantly mal-functioning of various social welfare programmes in the surveyed villages of two districts in KBK Region of Odisha. The research also discovered that the food security status of the tribal people is critically determined by continuous access to reliable wage labor and free access to forest rights. The following table has explained both men and women's perception of food security in the surveyed villages of sample districts in KBK Region.

Table-5.53: Women and Men's Perception of Food Security in the Study Area

Women' s Perception
• Having two square meals a day is quite difficult for them
• Not having sufficient budget to buy food grains for all members of the household
• A minimal amount of rice stored for future consumption
• Do not get adequate nutritious food for them and their children
• They are not able to manage and maintain food security status due to lack of low income
• They earn a small amount of extra income per year from raising animals like goat, pig, and hens
• They are not save money at all due to insufficient earning
Men's Perception
• Having causal and irregular income due to lack of employment opportunities
• Not having a regular and permanent income source
• Lack of adequate harvest of paddy *Mandia* and millets resulting in insufficient consumption of food resulting in food insecurity among them
• The little amount of rice and *mandia* stored for future consumption
• Not having adequate food like rice, *mandia,*and flesh for every day
• They are getting very low wages due to various factors
• They have very low assets like fertile lands and animals

Source: Field Survey, January-February, 2017

5.6.2: Patterns of Food Insecurity among the Tribal People in the Study Area

Poverty and under nutrition is severe among the poor tribal people due to low food availability and low-income level in the studied villages of two districts in the KBK Region. The study found out that, the maximum of their total income goes into food expenditure followed by non-food expenditure among the poor tribal families in the sample villages. Furthermore, the study discovered that the required calorie intake among the tribal people is very low and inadequate because of insufficient food grains and poor quality food and also less spending on various essential services required for attaining both food and nutrition security in the sample households. Therefore, the above two factors severely affected both food and nutritional security of the indigenous people and moreover it badly affected the kids due to inborn incapability to raise the food intake for their growth requirements in the studied area. There are remarkably poorer households (37 percent) in Babjore village of Balangir district and 70 percent in other two villages of Rayagada district and the calorie intake among the tribal people is below the ICMR recommended level. Moreover, it can be concluded that, there is more proportion of

undernourished females in the study area of Rayagada district. And also the factors like the low quantity of food, low food intake, low nutritious food intake, clean drinking water and basic health care benefits are considerably responsible for chronic under nutrition in the state and acute under nutrition among the tribal people in the surveyed villages.

Mortorell and Ho (1984) articulates that, poor food intake for a long duration is the most important factor for chronic under nutrition and also low access to health care benefits and repeated suffering from various diseases are some other important reasons for acute under nutrition in the society. Present study found that a large proportion of tribal people close to 70 percent of the two villages consume less than the required level of 2,400 kilocalories per day in Rayagada district. Moreover, 68 percent of children are underweight in the sample villages of Rayagada district is substantially higher than the Babjore village of Balangir area. The study also found that, there is a high percentage of income poverty along with child under nutrition and adult under nutrition among the majority family members in surveyed villages of KBK Region. The filed survey report shows that acute under nutrition is very high among the tribal people, but females are most affected because of inadequate and poor quality of food grains and other essential services. The overall broad picture tells that acute under nutrition is very high among the tribal people in the two villages of Rayagada district. The tribal people are facing temporary food shortages due to consumption pattern change and lack of decrease in food consumption in the villages. Furthermore, many households consumed broken rice instead of good rice, and the majority of tribal families have decreased their purchase of food from the market due to lack of purchasing power. They attempt to tackle hunger with low-cost foods. The tribal people do not take quality and nutritious foods in breakfast, lunch and dinner due to various factors and they mostly intake foods like occasional tea, puffed rice and broken grains and rice. However, the tribal people take both rice and mandia along with curry and sometimes also *Pakhal* (water rice) during lunch time. And most of the times they do not get nutritious food throughout the year in the surveyed villages of the sample district. Moreover, the study discovered their additional dietary pattern like kendu fruits, cake made from pulses, mango juice cake, tamarind, and mahua flowers because of the shortage of essential food grains. Occasionally, the tribal people took infectious food items like wild mushroom, different meat like rat, snake, birds, *Cahru* made from infected mango kernel and tamarind seed powder which caused diarrhoea and dysentery including some

other infectious diseases too. This has affected the food and nutritional security status of the people in the sample villages.

5.6.3. Attitude towards Traditional Food Practices in the Study Area

According to the literature (Kuniyal et al., 2004; Navdanya, 2006; Grassroots Institute, 2012), there are significant benefits of growing traditional crops, as it includes low input requirements and suitability to grow within the local environment. However, most household members in the selected villages relying on agriculture indicated that they no longer grow traditional varieties because there is limited market access for such crops, fewer financial pay-offs for growing such crops, and people view their cultivation as labour-intensive. On the other hand, they are also losing interest in cultivation due to various reasons. They mostly follow the *Podu Chasa* (it is called as the burning and slashing cultivation). They produce only paddy and *Mandia* on the flatlands and red gram on the top of the hill in the winter season. Nowadays, they are losing interest in the traditional cultivation and food practices due to change in lifestyle, modern technology, and taste and preferences among the tribal people in sample villages. It is observed from the study that, the consumption of *Mandia* and other traditional beverages are on a decline due to the availability of foreign liquor. However, there are tribal people who do not want to leave their traditional practices and food practices, as they are associated with their culture and tradition strongly especially in the studied villages.

Photo-5.6: Cultivated area on the side of the Mountain in Bhitarapadamajhi Village of Rayagada District

Source: Field Survey, January-February 2017

The above picture tells about the *Podu Chasa* (shifting cultivation) by the tribal people in Bhitarapadamajhi village of Rayagada district in the KBK Region. As burning and slashing is better known as shifting sultivation (or *Podu Chasa* in tribal language) is one of the important livelihood patterns of the tribal people and it gives them food grains for their survival. Moreover, due to lack of access to land because of hill and mountain area, they mostly depend on shifting cultivation (*Podu Chasa*) and forest for their survival. And as it is seen from the above photo, where one side of the mountain is ploughed and prepared for cultivation. They mostly sow finger millets there as it provides nutrition to the tribal people.

5.6.4. Value and Importance of Traditional Crops and Food in the Study Area

In the tribal society, growing traditional food is perceived as a form of security for tribal people, and there is little evidence that the knowledge surrounding the cultivation of traditional crops is being transferred to the new generation of farmers. Though the practice and knowledge of cultivating traditional crops are slowly vanishing among the tribal people in the region in recent times, the perceived health benefits of consuming traditional crops are often being acknowledged, as said by the local farmers in the study area. Moreover, traditional crops such as *Mandia* and red millet are not only associated with controlling blood sugar levels for diabetes, but the “old foods” are described as being easier to digest, having medicinal benefits, and making people active and nutritionally healthy. During the interviewing process in the study area, it was discovered that the benefits of traditional foods are often associated with knowledge from the “old culture” or way of life that tribal people in this region have traditionally relied on. Furthermore, not only are traditional crops recognized for their health benefits, but they also provided a sense of security to the tribal people. Some respondents felt that food security can be ensured by continuing to have the ability to grow and store their crops, particularly *Mandia*.

Photo-5.7: Women are engaged in drying *Mandia* for preparation of food in Sample Village

Source: Field Survey, January-February 2017

The above photo explains about the Mandia consumption among the tribal people in the Bhitarapadamajhi village of Rayagada district where two older women drying finger millets (Mandia as locally called in the tribal language) for their day to day consumption. *Mandia* is one of the staple foods among the tribal people along with rice. They consume it all three times a day as it provides more nutrition to them. The importance and value of traditional food like Mandia has declined due to modernity, due to change of dietary patterns and deforestation.

5.6.5. Household Coping Strategy against Food Insecurity in the Study Area

The millions of households are vulnerable and threatened by floods, droughts, recurring of uncertain weather and food supplies throughout the world including India (Stern, 2007). Therefore, in order to overcome and tackle those difficult situations, majority of the households in the rural areas follow different remedial measures and actions (technically called coping mechanism) in the world (Thomas, 1990; Beck, 1989: Chambers, 1989; Corbett, 1988). “The term 'coping mechanisms' will refer to responses to meet actual food shortage”. Davies (1993) “defined coping strategies as a comparatively immediate reaction to an immediate and in habitual decline in access to food, and attaining food security”. There are different important actions or remedial measures a typical household can take for tackling the food insecurity crisis like the storing of food, savings, saving of assets and sale of assets, borrowing from relatives.

The study found out that households are consuming tamarind seeds, sal seeds, mango juice cake, dried mahua flowers and kendu fruits during the time of food scarcity and it is an essential and important food consumption of the tribal people in the surveyed villages. Furthermore, to meet the daily requirement of food during scarcity, tribal people used tapioca, sweet potato, mango kernel, jackfruit seed, *Mahua*, etc. The research also discovered that tribal people eat lots of roots and tubers, as it possesses large quantity of fat, protein, mineral and variety of vitamins C. Furthermore, tribal people also eat jackfruit and its seeds particularly in summer when the food consumption goes down because of unavailability of food grains in the sample villages of the district. And more interestingly, majority family members collect and store the jackfruit seeds and mango seeds particularly for the rainy season, during which, they clean and wash the stored seeds in the water and boiled those seeds in hot water, chop and grind it, then mix it with salt and consume them. They told the researcher, it provides a lot of nutrients to their body and as it is one of the staple foods for them to eat.

5.6.6. Importance of Forest in Providing Food Security to the Tribals in the Study Area

Historically it is seen that forests and tree-based agricultural systems provide essential livelihood both directly and indirectly; particularly to the tribal people in India. The present study also found the forest is one of the most important sources of livelihood of the tribal people in Rayagada district. The role and importance of forest is widely recognized in the international platforms as it plays a very crucial role in maintaining and preserving the ecosystem that is very important to agriculture. In the study, large deforestation was observed due to climate change, which in turn was an outcome of expansion of large scale industries. People said deforestation has a bearing on the lives and livelihoods of thousands of tribal households in the Rayagada district. The conservation efforts for preservation of ecology are on a lag, despite several researches, and policies indicating the importance and role of forest in providing food and livelihood security to the indigenous people in the society. The study found that tribal people get essential nutrients and vitamins from wild fruits, leaves and vegetables in the KBK Region and it also gives substantial money income to them regularly. They also get lots of benefits both directly and indirectly from selling firewood in the market as an income source and eating bush meat for their sustenance as it provides energy to them.

According to Deb (2017), "forest species are more resilient to climate change than any of the cultivated crops and guaranteeing food security to the people." "The State of the World Forests Report (SOFO) 2016 mentioned that forest resources are central to food security and improving the livelihood of the tribal people in the society. The report highlighted the need for preserving the forest resources as the same will help to increase the resilience of the tribal communities through ensuring employment, wood energy, collection of fruits, shelter, fodder, medical essentials, food, fiber, giving income and food and also help the tribal societies to grow and prosper." Furthermore, the report also underscored the critical role of forest resources in achieving six of the SDG goals set by the UNO. However, the significant contributions of forest resources are highlighted poorly in food security strategy and national progress. "FAO (2009) highlighted that due to lack of proper coordination among the different stakeholder sectors; the forest resources are generally left out of policy assessments related to food and nutrition security." In line with the existing studies, the study discovered that there is a high demand of forest products and services in the weekly tribal market and also in the town as it has the own great value and importance in generating income for forest dependent families. There is a great and high demand of forest products and services like a variety of fruits, medical leaves, amla, honey, plates made from *Sal Leaves* in the urban malls of the state. Although it is considered as an opportunity for upliftment and economic empowerment of the indigenous communities on one hand but on the other hand, excessive harvest would also lead to deforestation and degradation of natural resources reducing the availability in the future.

Photo- 5.8: A woman making Plates out of *Siali Leaves* in Tikarpadar Village of Rayagada District

Source: Field Survey, January- February 2017

The above photo explains about the livelihood aspect of the tribal people in the sample village of Rayagada district of KBK Region. It is seen from the above photo that, a woman is making plates from Siuli leaves for selling purpose, as it provides income source and livelihood to the tribal households. It is one of the most important forest products that remain a source of income for their survival in the Tikarpadar village of Rayagada district. However, the income from the forest sources is on a declining trend due to deforestation and restriction of forest rights, which in turn results in food insecurity among tribal households.

The whole livelihood of the tribal communities mostly depends on forests and traditional agriculture in the state. Those communities are making great efforts to increase the food grain production through agricultural cultivation, but it is hampered due to scarcity of water, less fertile land, low land holding capacity, jungles and hilly terrain and most importantly lack of government supports. And above all these problems lead to low-income status among the tribal people resulting in less food for their consumption. The state-sponsored subsidized programmes like PDs has a lot of implementation problems in the remote areas of the state, where it has failed to provide food grains and other essential items particularly to the poor tribal people in the Rayagada districts. Therefore, food security is one of the major problems in the remote tribal areas of the two districts of the KBK Region of the state. Chronic and severe malnutrition and starvation are stark realities among the tribal people in many villages in the KBK Region of the state even today (Xaxa, 2002). “For the tribal communities, the forest is not just a source of food, but it is also a part of their identity”. “Tribes such as the Kondhas’ way of life is respectful of others including nature and recognizes diversity in its different manifestations”. There is a strong and close relationship of the tribal community and the forest and it is considered as belonging rather than ownership. Furthermore, health and growth of the forest depend on community forest management. “Elinor Ostrom, who advocated for common rights over land and forest, mentioned that local users have long-term rights to harvest from the forests and they are more likely to monitor and sanction against those who break the rules, resulting in better forest conditions”.

5.7: Comparative Study of Sample Villages in the Two Districts

The development and underdevelopment can be known from a comparative study of two regions or countries. Moreover, when the study compares two regions on different indicators, it would say that which region is more developed and which region less developed. In this case, the

present study made a comparison of one village in Balangir and two villages in Rayagada district in KBK Region of the state. The following table details comparative assessment between the selected villages of Balangir and Rayagada districts on several parameters that are crucial to assess food and nutritional security, and also a comparative picture of development and backwardness within the selected villages of KBK Region in Odisha.

Table- 5.54: Comparative Study of Three Villages in the Two Districts of KBK Region

Important Indicators	Balangir Districts	Rayagada Districts
SC and ST Population	85 percent	100 percent
Literacy	63 percent	38.48 percent
Wage laborer	28 percent	38 percent
Income Status having more than 20000 Per Year	31.64 percent	6 percent
Land Status	27 percent	63.34 percent
Wage Rate above Rs. 200	60.54 percent	18 percent
Percent of People Engaged in MGNREGS	20.4 percent	8.6 percent
Saving Status	62 percent	11.66 percent
Type of Ration Cards	71 percent	33 percent
Type of Households	36.74 percent	80.06 percent
Targeting Errors	34.7 percent	76 percent
Three Square Meals in a Day	57.15 percent	28.4 percent
Sources of Drinking Water	53 percent	26.8 percent
Toilet Facilities	45.92 percent	4.67 percent
Monthly Consumption Expenditure on Rice	38.06 percent	41.68 percent
Weekly Per Capita Consumption of Food Grains	33.68 percent	50 percent
Per Capita Consumption of Food Grains Per Day	250 gram	208 gram
Do not Attain Calorie, Protein, and Fat	40.2 percent	63.8 percent
Percent of Children Having low BMI	39.7 percent	61.02 percent
Percent of Adult Having Low BMI	35.52 percent	60.9 percent
Precaution Taken by Pregnant Women	70 percent	28.4 percent
Children Drop Out Rate	42.5 percent	70.7 percent
Access to PHCs	80.62 percent	22.5 percent
Having Proper Houses to live	80 percent	35.2 percent

Source: Author's Calculation from Field Survey, January-February 2017

The above table explains the comparative study of Balangir and Rayagada districts of KBK Region in the state. The essence of the comparative study is done between the developed district (Balangir) and most underdeveloped district (Rayagada) on the aspect of food and nutritional status of the household members of the three villages. We found out from the comparative study from the above table is that Balangir is well developed and is ahead of Rayagada district in all the parameters. Both the primary and the secondary data speak the truth about the two districts in the KBK Region. It explains the essential socio-economic status along with the important parameter which the current study has focused on, the food and nutritional status of the members of the households in the three villages of the two districts. It is seen from the above table that there are 86 percent SCs and STs population in Balangir, whereas it is 95 percent in Rayagada district. There is a very high literacy rate in Balangir whereas it's very low in Rayagada district. There are close to 42 percent of people who are wage labour in Rayagada whereas it is 29 percent in Balangir district. Maximum 31.64 percent of households earn more than 1500 rupees per month in Balangir while it is only 6 percent in Rayagada district. Moreover, 27 percent of households are landless in Balangir whereas it is 63 percent Rayagada district. The wage rate is also low Rayagada whereas it is very high due are different reasons in Balangir district. There is very less number of people engaged in MGNREGS in Rayagada in comparison to Balangir district. There are only 11.66 percent of households save in Rayagada whereas it is 62 percent in Balangir district. It is one part of the story of the two districts of KBK Region in the state.

The other side of the story talks about the food and nutritional status of the household members in the two districts. There is 71 percent of the households having ration cards in Balangir while it is only 33 percent of the households have ration cards in Rayagada district. And 36.74 percent of households are poor in Balangir whereas it 80.06 percent in Rayagada and the targeting errors are very high in Rayagada while it is low in Balangir district. There are close to 60 percent household take three square meals in a day while it only 28 percent in Rayagada district. Most of the households depend upon on tube well for their drinking in Balangir whereas the maximum households depend upon the stream water from their drinking in the Rayagada district. There are 46 percent of households having toilet facilities in Balangir whereas it is only 4.67 percent in Rayagada district. The maximum households spend 33.68 percent on food in Balangir while it 42 percent in Rayagada district. The per capita consumption of food grains per

day is very low in Rayagada in comparison to Balangir district. There are 40.2 percent of household members not able to attain the calorie norms in Balangir whereas it is 63.8 percent in Rayagada district. There are 39.7 percent of children having low BMI in Balangir whereas it is 61.2 percent in Rayagada district. 35.52 percent of adults have low BMI in Balangir, and it is 60.9 percent in Rayagada district. 70 percent pregnant women have taken precautions in Balangir whereas it is only 28.4 percent in Rayagada district. The children drop out ratio is very low in Balangir whereas it is very high in Rayagada district due to various reasons. Access to PHC is high amongst the people of Balangir while it is very low in that of Rayagada district. Finally, the housing condition is terrible in Rayagada in comparison to Balangir district. The overall facts and figures of the districts portray that both the socio-economic condition and food and nutrition security status of the household members is very low in Rayagada in comparison to Balangir district in the KBK Region of the state.

5.6: Conclusion

With the results of the research findings, the study analyzed the pattern of food consumption of the people and their possible determining factors in the sample villages of Balangir and Rayagada districts of the KBK Region in the state. In other words, the essential results show a substantial low nutritional intake among the various social and economic groups in the study area. And the study also discovered that majority tribal people of the total population are mostly deprived and poor in Babjore village of Balangir district while the socio-economic and food security status of the tribal people is worst in the two villages of Rayagada district. It is found out that, the average per capita consumption including calorie, protein, and fat is considerably below the recommended level amongst the tribal families in the two villages of Rayagada district. There are factors like lack of access to land, employment opportunities, low income, low education, poverty, and other factors that expose them to risk of food supplies and nutrition deficiency from one generation to another. Moreover, protein, calorie, and fat consumption are found to be higher among male adult and children as compared to the female counterpart in the study area. However, in the case of the present research where the study found, the relationship between nutritional intake and monthly per capita consumption is positive due to rising income level of the households in three villages of two districts in KBK Region. The study observed that the economically better-off households are having good per capita consumption over the poor economically households in all three villages of two district. Likewise, it is also seen from the

analysis that Babjore village of Balangir district is having better food and nutritional status than the other two villages of Rayagada district. The demographic and socio-economic factors like family members, religion, caste, monthly per capita income and expenditure crucially determined the balanced diet of the household members. It is keenly observed that the tribal households have some traditional food and food habits which are very much detrimental to the nutritional security, for instance, eating mango seed, kernel powder, wild mushroom, tamarind seed powder, and rotten meat, etc. may create health-related problems and sometimes lead to fatal situations. Therefore, massive awareness programs, nutrition related education and the provision of subsidized food especially during the period of food scarcity would be an appropriate measure to overcome the difficulties faced by the tribal people.

Chapter - VI
Summary and Conclusion

6.1: Introduction

Over the last twenty years, it is observed that, the country has achieved phenomenal growth rate along with reduction of poverty. However, an overall improvement in food and nutritional status were not kept in pace with this high growth rate. As a result, there is a slow and sluggish reduction of overall malnutrition and hunger in the country in general and tribal regions in particular (Dev, 2008). Fifty percent of the total population and mostly children and women suffer from under nutrition and hunger in the country (Dreze, 2009). Therefore, hunger and malnutrition have become an impediment to the overall progress in human development of the country. The percentage of under nutrition and hunger among the children particularly among the girls is very high on account of micronutrient deficiencies and energy deficiencies occur in mothers across various parts of the country and particularly BIMARU states, including Odisha, Jharkhand, and Chhattisgarh (Shiva, 2005).

Despite the substantial food grains production, availability of buffer stock and huge widespread of PDS networks and implementation of various state support policies, still millions of people are having food insecure and nutritionally deficiency in Odisha (Mohapatra, 2018). It is seen from various reports that, there is a low level of per capita accessibility and availability of cereals and pulses among the people which are below the acceptable level that is required for a healthy living for a majority population. The state government has not only strictly implemented different welfare schemes in time-bound manner but also brought up governance and accountability for reducing hunger and malnutrition (Das, 2016). Thus, Odisha has been successful in reducing poverty, hunger and under nutrition in major parts of the state but it has not been able to eradicate these problems among the tribal population of the KBK Region (Mohanty, 2015). Moreover, ensuring food security and improving the nutritional status of tribal people is a challenge for the KBK Region as well as for the whole state. Furthermore, malnutrition can be reduced with the intervention of various public health policies and programmes like enhanced safe drinking water facilities, training and public campaign about nutrition, quantity, and quality of foods, hygiene and disease precaution in the two villages of the district where the study has taken place (Sahu, 2016).

6.2. Objectives of the Study

- The study sought to examine the physical access to food in terms of food availability.
- The study tried to analyze economic access in terms of nutritional security.
- The study attempted to assess the intra-household food distribution system in the study area.

6.3. Methodology of the Study

The study has done the systematic and theoretical analyses of the study through both primary and secondary data. It is a case study method of all three villages of Balangir and Rayagada districts of KBK Region in Odisha. The study surveyed every household through structured questionnaire methods. The study interpreted the data of various sample households both analytically and logically. The study used both calorie intake method of ICMR and BMI Methods for measuring food insecurity and malnutrition among the people in the studied area of the KBK Region. Before measuring nutritional security status of the people, firstly there are indicators that helps to measure nutrition security such as health which depends on infant mortality, child mortality rate and maternal mortality rate, education which depends on mainly rural female literacy rate, safe drinking water which depends on percentage of households having safe and clean drinking water facilities and finally sanitation facilities which it depends on percentage of families have toilet facilities in their houses. There are two ways where nutritional security is measured for adult men and women (15 to 49 years of age) and children (4-14 years of age). The Body Mass Index (BMI) of Indian Council of Medical Research measures the weight in kg per height in meters in squares for adults and children for measuring malnutrition. It is purely a quantitative method for measuring the nutritional status of children and adults; there are other types of measurements like weight-for-height, weight-for-age, and height-for-age. Weight-For-Height (WHZ) - The weight-for-height (WHZ) index is an indicator of thinness or wasting**.** Weight-For-Age (WAZ) - Low weight-for-age index identifies the condition of being underweight, for a specific age. This index reflects both chronic and acute under-nutrition. Height-For-Age (HAZ) - Low height-for-age index identifies past under-nutrition or chronic malnutrition. It is an indicator of stunting, which can result from chronic malnutrition.

6.4: Major Findings of the Study

The following significant findings have emerged based on secondary data analysis and field survey observations.

- There are about 61 million stunted children under-five in India, according to UNICEF Report (2015).
- There are 45.7 percent underweight children in Odisha.
- And 38.9 percent stunted children in Odisha.
- The current study observed that the per capita availability of food grains has increased, but availability of pulses have declined due to various factors since after the 1990s onwards both in the country and in Odisha.
- The proportion of households accessing PDS is found high in Tamil Nadu followed by Andhra Pradesh, and the proportion is more than 76 percent in both states. Whereas it 65.4 percent in Odisha and it is only 37.2 percent in the KBK Region of Odisha.
- It is found that 32.6 percent people are living below the poverty line in Odisha compared to 21.9 percent in India
- The study found that the percentage share of total expenditure on food has declined from 63.2 percent in 1993-94 to 38.5 percent in 2011-12 due to various factors like increase in income, changes in lifestyle and changes of taste and preference of the people in the state.
- There is only 25 percent female literacy in the KBK Region of Odisha.
- More than 60 percent blocks are backward and underdeveloped in the KBK Region of Odisha.
- There are 48.4 percent stunted children in the KBK Region of Odisha.
- There is 65 percent literacy in Balangir district of Odisha of KBK Region.
- There are 33 percent stunted children in Balangir district of Odisha of KBK Region.
- It is seen that 81 percent blocks are backward and underdeveloped in Rayagada district.
- There is 49 percent literacy in Rayagada district of KBK Region.

- There are 44.4 percent underweight children in the Rayagada district of KBK Region in Odisha.
- There are 85 percent SCs and STs households in Babjore village of Balangir district whereas it is 100 percent tribal people in two villages of Rayagada district.
- There is 64 percent literacy in Babjore village of Balangir district, whereas it is only 35 percent in two villages of the Rayagada district.
- There are 35 percent of households do not have lands in Babjore village of Balangir District, and it is 55 percent in Bhitarapadamajhi and 72 percent in Tikarpadar village of Rayagada district.
- Only 19.94 percent of lands are irrigated in Balangir district while there are 24.4 percent irrigation facilities in Rayagada district.
- Primary income comes from wage labour in all three villages of two districts.
- The maximum 25 percent of households have more than 20000 rupees in a year in the Balangir district whereas it is only 6 percent and 4 percent in both villages.
- It is found that 72 percent of people save money in Babjore village of Balangir while it is only 12 percent in Bhitarapadamajhi and 10 percent in Tikarpadar village of Rayagada district of KBK Region in Odisha.
- Cereals (including Mandia) and paddy are mostly cultivated in Balangir district whereas it is cereals and mandia in the Rayagada district.
- There are more than 41 percent of households income spent on rice in Babjore village of Balangir district whereas it is 61 percent in Rayagada district.
- It is found that 55 percent of household members take three square meals a day in the Balangir district, and it is only 20 percent in Rayagada district.
- More than 40 percent of households in Bhitarapadamajhi and Tikarpadar villages responded that lower access to resources and low purchasing power is continue to be an important reason for not taking three square meals a day.
- More than 36 percent of households are poor in the sample village of Balangir district, and it is 80 percent in the Rayagada district.
- It is seen that 71 percent of households have BPL and 15 percent APL cards in the village in Balangir district whereas it is 32 only percent in the two villages of Rayagada district.

- There are 34.7 percent exclusion errors in the sample village of Balangir district whereas it is more than 75 percent in the sample villages of the Rayagada district.
- There are 60.94 percent household members those are able to meet the calorie, protein, and fat in the Balangir district whereas it is 40 percent in the Rayagada district of KBK Region in Odisha.
- The study found out that 50 percent of the women healthy in the Balangir district, whereas it only 25 percent in the Rayagada district.
- It is found that both boys and girls have severe problems with underweight in both districts. On the whole, 66.84 percent of children in the age group 4-14 years of age are in the range of healthy weight in the Balangir district. It is only 36.56 percent in the Rayagada district of KBK Region.
- It is found that 34.53 percent children are underweight in the Balangir district whereas it is as high as 58.55 percent in the Rayagada district.
- It is seen that 25 percent of households are having latrine facilities in the Balangir district whereas it is only 10 percent in Rayagada district.
- More than 70 pregnant women take Ante-natal checkups, immunization and iron supplementation in the Balangir district whereas it is only 28 percent in the Rayagada district of KBK Region.
- The children immunization with DPT and Polio vaccines is somewhat adequate in Balangir district, while it is very negligible in the Rayagada district.
- It found that 78 percent of the schools going children are receiving the MDMS benefits in the Balangir district, whereas it is only 32 percent in Rayagada district.
- More than 71 percent of schools going children in the age group of 3-5 years of age are availing healthcare facilities through Anganwadi Centers in the Balangir district where as it is only 33 percent in the Rayagada district.
- Only 22.3 percent households have access to PHCs in the Balangir district whereas it is 10 percent in the Rayagada district.
- It is found out that 80 percent of households own livestock in Balangir district while it is 95 percent in Rayagada district.

- Regarding the housing condition, 20 percent of families are having the pakka houses in Balangir district whereas only 2 percent of families are having the pakka house in the Rayagada district of KBK Region in Odisha.

6.3: Policy Suggestions for improving Food and Nutrition Security

Based on the above analysis, conclusions and findings, various policy suggestions and initiatives have been proposed, which would support in addressing the issue pertaining to food and nutrition insecurity problems and also starvation deaths in Balangir and Rayagada districts of the KBK Region in Odisha with particular reference to the poor tribal people.

- The government should give more importance to the small and marginal farmers and provide various financial supports to them. Moreover, farmers are the strength of the Indian economy and for also food security. It will help them to improve employment, food and nutrition security, health, and socio-economic conditions in the country.
- From the nutritional security front, the government must provide nutritional food through PDS, MDMS, and ICDS apart from other various facilities like safe drinking water facilities, sanitation facilities, and health facilities generally to the poor people and tribal people in particular in the country.
- The government should ensure that the TPDS later named National Food Security Act (NFSA) should make food grains and various important items to be available to the poor people in a time-bound and the regular way so that it will help them to achieve food security. Furthermore, the state machinary should weed out bogus cards and issue ration card to the genuine poor households in one hand and reduce corruption in the functioning of the scheme on the other hand.
- The government must take an initiative to distribute the land to the landless poor tribal people in the state particularly in the KBK Region.
- The state government must improve the functioning of different employment schemes in order to provide better economic opportunities for increasing purchasing power. It is crucial for poor people in increasing their standard of living and also enhancing state of food security.

- The state government should fix the problem in the functioning of ICDS and MDMS as the two schemes are vital for children and women, they aim at enhancing food and nutritional security to them and help also addressing issue of health among them in particular reference with KBK Region.
- The government must build essential infrastructure in the tribal areas of the state where access to road and communication are very difficult, as they are living in hilly and mountain areas.
- The state government must provide the Indira Awas Yojana and Biju Pakka Awas and also electricity to the genuinely poor people in the state.
- The government should take various steps regarding marketing of forest produce by tribals, as the existing middlemen and traders exploit them. Such interventions help them to get a better price for their products; in turn, it will help them in increasing their economic status of the poor tribal people in the state.
- The government must expand the social schemes like ICDS and MDMS to include all indigenous and vulnerable groups (like adolescent girls, poor boys, mothers, and pregnant mothers), particularly in the Rayagada district of KBK Region in Odisha.
- The state government should provide essential fortified food with proper vitamins and nutrients (iron and salt with iodine) to the poor tribal people in the districts.
- The government must provide food security by increased in production of food grains in terms of quantity and quality for the tribal people in the districts.
- The government must improve and increase the consumption pattern by encouraging food grains production and increased the availability of nutritionally quality food to the poor tribal people in the district.
- Effective income transfers (like improving the purchasing power of landless, rural poor, other vulnerable groups and expand and improve the PDS, MGNREGS and other social welfare schemes) should be provided to the people in the districts.
- The government should implement the various land reforms to reduce the vulnerability of the poor farmers and to improve the land access of the deprived landless farmers in the district.
- The government should increase the health and immunization facilities to the poor tribal adult and children in the early stage, nutrition knowledge, prevent food contamination;

monitoring the nutrition schemes time to time, strengthening the nutrition surveillance and community participation in the districts.

- The government should implement the Forest Rights Protection Act to provide forest rights to the poor tribal people in those districts of KBK Region.
- The government must improve and provide more connectivity in the rural areas of the district for better communications and access to the market.

To sum up, providing food security and improving nutritional and health status is a great task for the state and the whole country. The state government should strictly implement different welfare schemes in time-bound manner for enhancing food and nutrition security among the marginalized communities of the state. Moreover, it will also help to reduce under nutrition and poverty particularly in the KBK Region. The state government and other organizations must take other various initiatives like public health policy, creating awareness, training programme, sanitation drives for the poor people in these three villages of KBK Region in Odisha. As said by Amartya Sen, "these different requirements call for an effective broad policy alive of the diversity of causal antecedents that lie behind the many wretched reality of food insecurity in modern India". Since, the worst truth and situation of the country itself needs a change to a greater extent, which can be worked out by both the central and state governments in reducing hunger, under-nutrition, malnutrition and starvation death throughout the country.

The State must galvanize its resources for the poorest and most vulnerable sections of the society. It also needs a very comprehensive and broad strategy to reduce malnutrition and starvation deaths among these communities in the state. In particular, a specific focus needs to be laid in the distress areas like Kalahandi, Koraput, Rayagada, Malkanagiri, Nabrangapur districts of the KBK Region where majority tribal population reside . However, it is imperative, what noted economist Dreze (2001) calls "social security arrangements" of a permanent nature for the above problem. The State's enormous food grain stock presents a unique opportunity to put such arrangements in place to provide food and nutrition security through various welfare schemes and programmes to the underprivileged and vulnerable tribal population in the state in general and the two districts of KBK Region in particular.

GLOSSARY

Adimjati	**:**	Primitive People
Amba-koili	**:**	The mango kernel or seeds that tribal people in the KBK Region primarily consume.
Ambasada	**:**	It is known as also Mango Cake. The mangos are peeled and squeezed, and the juice is stirred vigorously to make it into a thick, uniform liquid. The liquid is then spread on a large winnowing fan and left to dry till it takes the shape of a cake.
Anusuchit Janjati	**:**	Scheduled Tribe
Balangir	**:**	The name Balangir district is derived from Balaramgarh. A fort built by Balram Deo in the 16th Century.
Cahru	**:**	It is made from infected mango kernel and tamarind seed powder
Damba Tribe	**:**	Mostly found in the KBK Region of Odisha and practice shifting cultivation for their sustenance.
Dharitri Odia Newspaper	**:**	It is a leading Odia newspaper that provides information in various parts of the state.
Handia	**:**	Handia is prepared out of rice with mahua flower and other ingredients.
Independent Odisha	**:**	The state became an independent state on 1st April 1936 after separated from Bihar.
Janajati	**:**	Folk people
Jhodia Kandha Tribe	**:**	These are the primitive sections of the Kandha community and traditionally hunter-gatherers. They are dwelling in the remote jungle.
Kandula	**:**	A special type of pulse known as kandula is primarily cultivated in the hilly forest region by the tribal people.
Kendu (Diospyros Melanoxylon Roxb)	**:**	It is an underexploited fruit species, is grown as natural wild in the forests and marginal lands in West Bengal, Odisha, MP, Bihar and Chhattisgarh. The tribal people collect it from the forest for eating purposes.

Mahula (Madhuca Longifolia	**:**	This survival tree has economic, cultural and geographical importance and dominates the farm economy. It is an essential source of livelihood for the tribal people in Odisha.
Mandia	**:**	It is called finger millets (Chilka dambu-dough- it is the liquid type of food with boiling water). It is the leading staple food of the tribal people in the KBK Region.
Pakhal	**:**	It is called watered rice in English term. It is basically cooked rice loaded with water that may be served fresh or after being slightly fermented.
Podu Chasha	**:**	It is known as also shifting cultivation. It is a traditional system of cultivation used by the tribal communities in Odisha, whereby different areas of jungle forests are cleared by burning each year to provide land for crops for a limited period of years.
Rayagada	**:**	The Rayagada district is derived from "Raya," which indicate the rock and "Gada" means the deep holes in the rock according to the opinion of the local people.
Sal leaves (Shorea Robusta)	**:**	It is a crucial NTPF of Central and Southern Odisha. It is used for making plates. It is a significant source of income for forest dwellers in Odisha, and it is mainly found in the tribal belt of the state.
Siali Leaves (Bauhina Vahlii)	**:**	Leaves used for making plates. The leaf is mainly used locally by the tribal people, grocery shops, and traditional petty hotels. It is more precious than the sal leaves in the local market.
Vanajati	**:**	Castes of the forest
Vanavasi	**:**	Inhabitants of the forest
Varna Vyavastha	**:**	Caste System

APPENDIX

Above Poverty Line	:	A measure of a person's standard of living above its designated poverty threshold
Agricultural labourer	:	It can be defined as the involvement of any person in connection with cultivating the soil or in connection with raising or harvesting any agricultural or horticultural commodity, management of livestock, bees, poultry etc.
Anaemia	:	It is a condition in which there is a deficiency of haemoglobin in the blood, resulting in pallor and weariness.
AWCs	:	It is a type of rural child care centre in India and designed to combat child hunger and malnutrition.
Barren Land	:	It consists of soil that is so poor in which plants cannot grow.
BIMARU	:	It consists of the four most backward and underdeveloped states in India, such as Bihar, Madhya Pradesh, Rajasthan and Uttar Pradesh.
Blind Belief	:	A superstition is any practice, which is irrational, arising from ignorance and orthodox thinking.
BMI	:	It is the person's weight in kilograms divided by the square of heights in meters.
BPL	:	It is a benchmark used by the government of India to indicate economically disadvantaged households for government assistance and safety net.
CD Block	:	It is a rural area administratively earmarked for planning and development
Child Mortality Rate	:	It is the probability of a child born in a specific year dying before reaching the age.
Coping Strategy	:	These are the tactics and measures opted by households in a planned way and in a particular sequence to minimize the risk and shocks which arise due to food scarcity.
Customary Practice	:	It is defined as the practices inherited from the past that are accepted and respected by the members of a community.

Deforestation	:	It refers to the decrease in forest area across the world that is lost for different uses such as agricultural croplands, urbanization, industrialization, and mining activities.
Eastern Ghats	:	The Eastern Ghats are the discontinuous range of mountains along India's eastern coast that passes through Odisha and AP to TN.
Economic Access	:	It is ensured that all households and all individuals have sufficient resources to obtain appropriate foods for a nutritious diet.
Fallow Land	:	It is a type of land which is not cultivated and not used for many years.
Food Charts	:	It is a daily log of what you eat and drink each day
Head of the Households	:	The head of the household plays an essential role in decision making in households.
Hilly Terrains	:	Having irregular surface, trees with rough bark, rough ground and rough unsmooth face.
Hunger	:	It is a situation in which a person feels weakness due to a lack of food.
Hunter-gatherers	:	A nomadic people in which food is obtained by hunting, collecting and gathering for living.
Huts	:	It is a small dwelling of simple construction, mainly made of natural materials such as logs or grass
Indigenous Communities	:	A nomadic people in which food is obtained by hunting, collecting and gathering for living.
Local Tribal Haat	:	It is the heart of the tribal economy. The haat that come up at intervals of seven days at a particular place offers a peek into the socio-economic and cultural life of local tribal communities.
Leafy Greens	:	It refers to different types of leaves collected from the forest for cooking purposes
Livelihood	:	It refers to the means of securing the basic necessities of life.
Livestock	:	It is commonly defined as domesticated animals reared in an agricultural setting for the source of income.
Nagada Village	:	It is one of the most impoverished villages where under-nutrition and starvation deaths occur among the tribal people in the Jajpur districts of Coastal Odisha.

Nutritional Deficiency	:	It occurs when the body is not getting enough nutrients such as vitamins and minerals.
Nutritional Intake	:	Refers to an individual's daily eating pattern including, specific foods and calories consumed and relative quantities.
Occupational Structure	:	It refers to the aggregate distribution of occupations in society, classified according to skill level, economic function, or social status.
Outcome Index	:	It measures the food security status of the people taking consideration into a set of variables.
Physical Access	:	Physical existence of food and domestic food production, food imports, food exports, food aid and domestic stock.
RDA Norms	:	It is an average daily level of intake sufficient to meet the nutrient requirements of all healthy people.
Stream	:	It is a body of water with surface water flowing within the bed and banks of a channel.
Stunted	:	It is the impaired growth and development that a person experience from poor nutrition, repeated infection and inadequate physical stimulation.
Tendulkar Methodology	:	This is responsible for studying the portion of the population that lives below the poverty line through using different criteria.
Thatched House	:	It is an old and traditional form of house and made of mud, straw, rushes, heather and palm branches. It is mainly found across Odisha.
Under-nutrition	:	It is defined as insufficient intake of energy and nutrients to meet an individual's needs to maintain good health.
Under-weight	:	A person whose body weight is considered too low to be healthy.
Wage Laborer	:	It refers to a person whose primary means of income is from the selling of his/her labour in this way.
Wasting	:	A person is too weak and tired due to a lack of proper nutrition, adequate food and severe disease.

BIBLIOGRAPHY

Aggrawal, A. (2011). The PDS in Rural Odisha; Against the Grain, *Economic and Political Weekly*, 46 (36), pp. 21-23.

Agrawal, S. (2013). Health and Nutritional Disadvantage among Tribal Women and Children of Odisha: An Enquiry. *Journal of Community Nutrition and Health*, 2 (1), pp. 3-14

Agricultural Census, 2011-12 & 2015-16, Government of India.

Agricultural Statistics at Glance, 2013-14, 2014-15, & 2015-16, Government of India.

Bagchi, D. K. & H. Doyal (2004). The State of Adivasi in Odisha: A Human Development Analysis. *Sage Publication*, New Delhi.

B. Rajashree (2018). Book, Review; Food Security Atlas of Rural Odisha 2018 and Food Security Atlas of Rural Bihar 2018. *Indian Journal of Human Development*, 13(3), pp. 392-396.

Balgir, R. S. (2002a). Dimension of Rural Tribal Health, Nutritional Status of Kandha Tribe and Tribal Welfare in Odisha: A Biotechnological Approach. *UGS Sponsored National Conference on Human Health and Nutrition, Thane*, 12-13 December.

Balakrishna, P. and Bharat Ramaswami (1997). Quality of Public Distribution System; Why it Matters. *Economic and Political Weekly*, 32 (4), pp. 47-57.

Basumatary, S. (2015). An Analysis of Consumption Expenditure Pattern among the Bodo Tribe: A Case Study. *International Research Journal of Interdisciplinary and multidisciplinary Studies*. I (V), pp. 42-48.

Behera, S. and G. C. Penthoi (2017). Food insecurity and Government intervention for Susttainable Food Access in Odisha. *International Journal of Latest technology in Engineering, Management and Applied Science*, VI (II).

Census of India (2011). Government of India.

Christiansen, N. (2000). Measuring Vulnerability and Food Security: A Case Evidence from Mali. *Department of Agriculture, Resource and Managerial Economics*, Cornel University, Ithaca.

Coates, J., E. A. Frongilo, B. L. Rogers, P. Webb, P. E. Wilde, & R. F. Houser (2006). "Communities in the Household Experience in Food Insecurity Across Culture: What are Measures Missing"?. *Journal of Nutrition*, 136 (32).

Coates, J. A. Swindale, and P. Bilinsky (2007). Household Food Insecurity Access Scale (HFLAS) for Measurement of Household Food Security Access: Indicator Guide Version 3. *Washington DC*.

Corbett, J. (1988). Famine and Household Coping Strategies. *World Development*, 16, pp. 1099-1112.

Cornia, G. A. & F. Stewart (1993). Two Errors of Targeting. *Journal of International Development*, 5 (5), pp. 459-496.

Das, S. and Rajesh Sahu (2016). Food Insecurity in Odisha; Can NREGA be able to solve it?. *Vandana Publications*, 6 (5), pp. 35-42.

Dass, S. K. (2004). Changing Trend in Health and Nutrition. *Gyan Book Publishers*, New Delhi.

Devereux, S (2001). Sen's Entitlement Approach: Critiques and Counter-critiques. *Oxford Development Studies*, 29 (3), pp. 245-263.

Dutta, R. and R. S. Sundaram (2005). Food Security in India, Indian Economy. *Sultan Chand Publication*, New Delhi.

Davies, S. (1996). Adaptable Livelihoods: Coping with Food Insecurity in the Malian Sahel. *Macmillion Press Ltd*, Hampshire.

Deaton, A. and Jean Dreze (2009). Food and Nutrition in India: Facts and Interpretations. *Economic and Political Weekly*, 10 (9), pp. 42-65.

Deaton, A. and Jean Dreze (2002). Poverty and Inequality in India: A Re-examination. *Economic and Political Weekly*, 37 (36), pp. 45-55.

De Haan, A. and A. Dubey (2005). Poverty, Disparities, or the Development of Underdevelopment in Orissa: *Economic and Political Weekly*, 40 (22), pp. 2321-2329.

De, R. and S. K. Kundu (2016). Nutritional Status of Adult Female Tribes in Different Villages of Jhargram, West Bengal. *World Journal of Pharmacy and Pharmaceutical Sciences*, 5 (12), pp. 1213-1220.

Deshinhkar, R. and C. Johnson (2003). State Transfers to the Poor and Back: the Case of the Food for Work Programme in Andhra Pradesh. *Overseas Development Institute, Working Paper, 222*. London.

Dev, S. Mahendra (2008). Inclusive Growth in India; Agriculture, Poverty, and Human Development. *Oxford University Press*, New Delhi.

Dev, Mahendra, S. and N. Chandrasekhar Rao (2009). India's Perspectives on Equitable Development. *Academic Foundation*, New Delhi.

Devereux, S and M. Maxwell eds. (2001). Food Security Information Systems, Food Security in Sub-Saharan Africa. *ITDG Publishing*, London, pp. 1-12.

Dreze, Jean (2001). Starving the Poor. The Hindu, 26th February 2001.

Dreze, Jean (2003). Hunger amidst Plenty. *India Together*, December, 3.

Dreze, Jean (2004). Democracy and Right to Food. *Economic and Political Weekly*, 39 (17), pp. 1723-1731.

Dutta, B. and B. Ramaswami (2001). Targeting and Efficiency in the Public Distribution System: A Case of Andhra Pradesh and Maharashtra. *Economic and Political Weekly*, 37 (28), pp. 1524-1532.

Economic Survey, Government of India, 2015-16, 2016-17, 2017-18, 2018-19, and 2019-20.

Economic Survey, Government of Odisha, 2015-16, 2016-17, 2017-18, 2018-19, and 2019-20.

Mundhe, F. (2015). Agricultural Productivity in India: Trends during the Five Years Plans. *The Business and Management Review*, 5 (4), pp. 1-7.

FAO (2006). The Sate of Food Insecurity, *FAO*, Rome.

FAOSTAT (http:/faostat.org/).

FAO (2012). The State of Food Insecurity in the World, 2012: Economic Growth is Necessary but not Sufficient to Accelerate Reduction of Hunger and Malnutrition. *FAO*, Rome.

Field Survey Report (2017), January-February, Odisha.

Food Insecurity in Odisha (2016). An Analysis of Secondary Data. United Nations Food Programme, *Ministry of Agriculture*, Government of India.

Frongillo, Edward, A. Jr (1999). Validation of Measures of Food Insecurity and Hunger. *Journal of Nutrition*, Vol. 129 (2) , pp. 506S-509S.

Gaiha, R. (2000). Does the Right to Food Matter? *Economic and Political Weekly*, 38 (40), pp. 4269-4276.

George, P. S. (1996). Public Distribution System, Food Security, and Production Incentives. *Economic and Political Weekly*, 31 (39), pp. A140-A144.

Gopan, C., S. Rama, & S. Balsubramanium (2012). Nutritive Value of Indian Foods. *National Institute of Nutrition*, Hyderabad.

Government of India (2009). Report of the Export Group to Review the Methodology for Estimation of Poverty. *Planning Commission*, New Delhi.

Grangolati, M., Shekhar, M., M. Dasgupta & Y. Lee (2005). India's Undernourished Children: A Call for Reform and Action. *Health, Nutrition and Population Series,* World Bank.

Haddad, L., E. Kennedy, & Joan Sullivan (1994). Choice of Indicators for Food Security and Nutrition Monitoring. *Food Policy*, 19 (3), pp. 329-343.

Hassen, F. & M. Sulaiman (2007). How Sustainable is the Grain in the Food Consumption of the CFPR/TUP Beneficiaries. *CFPR Working Paper Series 18*, Bangladesh.

Hazra, A. (2005). Food Security and Women in Rural Areas: An Issue of Entitlement. *Rawat Publication*, New Delhi.

Himanshu (2007). Recent Trends in Poverty and Inequality; Some Preliminary Results. *Economic and Political Weekly*, 31 (25), pp. 497-521.

Human Development Report, 2008-09, Government of India.

Indrakant, S. (1996). Food Security and Public Support. *Rawat, Publication*, New Delhi.

Jena, M. (2008). Food Insecurity among the Tribal Communities in Orissa. *Economic and Politically Weekly*, 43 (6), pp.54-62.

Kochar, A. (2005). Can Targeted Food Programmes improve Nutrition? An Empirical Analysis of India's Public Distribution System. *Economic Development and Cultural Change*, 54 (1), pp. 203-223.

Mortorell, R. & T. J. Ho (1994). Malnutrition, Morbidity, Mortality, and Child Survival; Strategies for Research. *American Society for Clinical Nutrition*, pp. 59-68.

Maxwell, Daniel, G. (1996). Measuring Food Insecurity; the Frequency and Severity of Coping strategies. *Food Policy*, 21 (3), pp. 191-203.

Meshram, C. T., A. Kavishwar, V. P. Rao & R. Babu (2014). Nutritional Status of Baiga Tribes Baihar District, Madhya Pradesh. *Journal of Nutrition and Food Science*, 4 (3), pp. 1-4.

Mishra, Bhagabat (1985). Economics of Public Distribution System in Food Grains. *Asish Publishing House*, New Delhi.

Mishra, S. and S. Pradhan (2008). To Study the Traditional Foods and Associated Knoweldge System relating to Health and Nutrition among Adivasi Women of Kalahandi District Odisha. *M. Sc. Dissertation*, Banarus Hindu University, UP.

Mishra, S. & S. Toppo (2008). To Study about Traditional Food Patterns and Changing Food Patterns of Adivasi Women of Jharkhand State. *MSc Dissertation*, Banarus Hindu University, UP.

Mohanty, A. (2018). Adivasi in Odisha have not benefited from decades-odd Government Schemes to Combat Malnutrition. *Health and Nutrition*, Scroll.in, April 4.

Mohanty, A. (2008). Food Insecurity: Some Ground Realities in Odisha Context. *Fraagile Ecological Archives*, March 28.

Mohapatra, B. (2017). How Forest Food ensures Nutritional security among Tribals in Odisha. *Social Story*, December 14.

Mohaptra, B. (2018). Agricultural Development and Food Security in Odisha. *Indian Journal of Economics and Development*, 8 (2), pp. 213-224.

Mohaptra, B. (2020). Poverty and Food Insecurity Disparities and their causes in the Eastern Indian States of Odisha. *International Journal of Community and Social Development*, 2 (4), pp. 426-448.

Mohapatra, K. K. & Urmimala Das (1993). Agrarian Transition and Social Change in Odisha. *The Journal of Political Science*, 54 (2), pp. 292-299.

Mooij, E. S. (2001). Food and Power in Bihar and Jharkhand; Public Distribution System and Its Functioning. *Economic and Political Weekly*, 29 (3), pp. 119-126.

Morterell, R. & T. J. Ho (1984). Malnutrition, Morbidity and Mortality. *Population Development Review*, Vol. 10, pp. 49-68.

M. S. Research Foundation & World Food Programme (2001). "*Food Insecurity Atlas of Rural India*," Chennai, India.

M. S. Research Foundation & World Food Programme (2001). *Food Insecurity Atlas of Urban India*, Chennai, India.

Nayak, R. (2002). Politics of Food Security and Starvation Deaths in Odisha: An Intervention in the KBK Districts of Odisha. *Indian Social Institute*, New Delhi.

Nayak, D. K. (2016). Changing Cropping Pattern, Agricultural Diversification, and Productivity in Odisha- A District-wise Study. *Agricultural Economic Research Review*, 29 (1), pp. 93-104.

N. Ghosh & B. Guha-Khisnobis (2006). Looking for Answers to the Food Security Problem; India under Current Compulsion. *WIDER Research*, Vol. 123.

National Institute of Nutrition (2012). Diet and Nutritional Status of Rural Population, Prevalence of Hypertension, diabetics among Adults, Infants and Young Child Feeding Practices. *National Institute of Nutrition*, Hyderabad.

Padhi, A. K. (2007). Agriculture and Food Security in Odisha. *Mainstream*, 19 (15), pp. 8-15.

Panda, T & R. N. Padhy (2007). Sustainable Food Habits of the Hill Dwelling Kandha of Kalahandi District in Orissa. *Indian Journal of Traditional Knowledge*, 6, (1), pp. 103-105.

Parida, N. (2008). Chronic Poverty and Hunger in KBK Region of Orissa: Identifying Causes in the Prospective of a Case Study in Watershed Development Project in Nawarangpur District. Unpublished manuscript, *Institute of Social Studies*, Hague.

Pati, Sikta & S. Panda (2010). Regional Disparities, Inclusive Growth and Displacement in Odisha. *Mainstream Weekly*, 40 (8), pp. 23-29.

Patra, A. K. (2018). Government initiative to solve the Problem of Malnutrition in Odisha: An assessment. *Journal of Social and Economic Development*, 14 (1), pp. 12-20.

Patra, P. (2018). Tribal Livelihood Practices and Food Security: A Study on Role and Responsibility of tribal Women in Odisha (India). *International Journal of Research and Scientific Innovations*, 5 (8), pp. 45-54.

Pattnaik, U. (2001). Concentration of Regional Food Outputs and PDS'. *People's Democracy*, 25 (23), June.

Pattnaik, U. (2004). The Republic of Hunger. *Social Scientist*, 32 (5), pp. 9-35.

Patra, R. (2014). Agricultural Development in Odisha, are the Disparities growing?, *International Journal of Food and Agricultural Sciences*, 3 (1), pp. 129-144.

Patrudu, M. S., G. C. Naidu, & D. P. Rao (2013). Health and Educational Status of Scheduled Tribes in Visakhapatnam District of Andhra Pradesh. *International Journal of Innovative Research and Development*, 2 (13).

Bilinsky, P. (2002). Measuring Household Food Insecurity: Why it's so important and yet so difficult to do?. *Journal of Nutrition*, 136 (5), pp. 1404S-1408S.

Pinstrup-Anderso, A. (2009). Food Insecurity; Definition and Measurement. *Food Security Science*, Vol. 1, pp. 5-7.

Planning Commission (2010). 'Performance Evaluation Cooked Mid-Day Meal', Programme Evaluation Organization, PEO Report, No. 202, *Planning Commission*, GoI.

Pradhan, M. & M. Ravallion (1998). Measuring Poverty using Qualitative Perceptions of Welfare. *Washington DC*, World Bank.

Pradhan, S., S. Mishra, & S. C. Mohaptra (2011). Food Practices among the Adivasi Women of Selected Districts of Western Odisha. *Indian Journal of Science and Medicine*, 42 (3).

PRAXIS (2002). Participatory Assessment of the Government of Odisha's Delivery Services Which Impact upon Poverty at the Village Level. *Institute for Participatory Practices*, Vol. 35 (31), pp. 45-75.

Radhakrishna, R. & K. Venkat Reddy (2010). Food Security and Nutrition, *Vision 2020*. Planning Commission, Government of India, pp. 1-17.

Radhika, K. & A. Ramesh (2011). Food Security: A National Prospective. National Seminar on Food Security. *ANGURU*, Hyderabad, March 25-27.

Radhakrishna, R. & C. Ravi (1992). Effects of Growth Relative Prices and Preferences of Food and Nutrition. *Indian Economic Review*, Special Number, Vol.27, pp. 303-323.

Rahman, A. (2015). Universal Food Security Programme and Nutritional Intake: Evidence from Hunger Prone KBK Districts in Odisha. Food Policy, 63 (76), pp. 73.86.

Radhakrishina, R. & C. Ravi (2004). Malnutrition in India: Trends and Determinants. S. Hrudaya Ranjan & K. S. James (eds.), Demographic Change, Health Inequality, and Human Development in India, Hyderabad. *Centre for Social and Economic Studies*.

Rakshit, M. (2003). Some Analysts of Short and Medium Term Food Policy. *Economic and Political Weekly*, 35 (4), pp. 45-56.

Rao, H. C. Hannumanta (2000). 'Declining Demand for Food Grains in Rural India: Causes and Implications'. *Economic and Political Weekly*, 35 (4). pp. 1-13

Rao, D. P. (2012). Food and Health Status of Scheduled Tribes in Visakhapatnam District of Andhra Pradesh. *Anvesha*, 4 (1), pp. 38-44.

Rathnayake, I. & Jeevika Weerahewa (2002). An Assessment of Intra-households allocation of Food: A Case Study of Urban Poor of Kandy. *Srilankan Journal of Agricultural Economics*, 4 (1), pp. 95-105.

Ravallion, M. (1987). Markets and Famines. *Clarendon Press*, Oxford.

Ravallion, M. (1997). Famines and Economics. *Journal of Economic Literature*, 35, (3), pp. 1205-1242.

Singh, R. (2015). An Analysis of Spatio-Temporal Changes in the Pattern of Crop Diversification in Indian Agriculture. *International Research Journal of Social Sciences*, 4, (12), pp. 15-20.

Ray, R. (2007). Changes in Food Consumption and the Implications for Food Security and Undernourishment: India in the 1990s. *Development and Change*, 38 (2), pp. 321-343.

Sabharwal. S. N. (2011). Caste, Religion, and Malnutrition Linkage. *Economic and Political Weekly*, 46 (50), pp. 16-18.

Sahoo, U. K. (2017). Increasing Malnutrition-led Mortality among Juang Tribal: A Situational Analysis in Nagada Village, Odisha. *Jharkhand Journal of Development and Management Studies*, 15 (1), pp. 1-15.

Sahu, C. (2005). Aspects of Tribal Studies. *Sarup and Sons Publications*, New Delhi.

Sahoo, P. (2014). Trends in Consumption Pattern: A Comparative Study of Odisha and India. *Journal of Indian Institute of Economics*, 56 (4), pp. 56-64.

Sahoo, P., D. Sahoo and Subhas Chandra (2020). Changes in Rural Poverty among Occupational Groups in Odisha: An Analysis of Post-reform Period. *Journal of Land and Rural Studies*, 8 (2), pp. 150-165.

Samal, K. C. (1998). Poverty Alleviation after Post Liberalization; Study of Tribal Block in Odisha. *Economic and Political Weekly*, 33 (28), pp. 1846-1851.

Salagrama, V. (2006). Trends in Poverty and Livelihoods in in Coastal Fishing Communities of Odisha State, India. *FAO Fisheries Technical Paper No. 490*, Rome.

Sarap, K. & M. Mahamalik (1997). Food Security System and its Operation; A Study of Some Villages in the District of Kalahandi Odisha. *Sonali Publication*, New Delhi.

Sarkar, R. (2016). A Study on the Health, and Nutritional Status of Tribal Women in Godam Line Village in Darjeeling District. *IOSR Journal of Humanities and Social Science*, 21 (11), pp. 15-18.

Sarkar, S. (2015). Consumption Pattern and Nutritional Intake among Rural Households of West Bengal, India. *Journal of Settlement and Spatial Planning*, 6 (2), 85-94.

Sen, A. (1981). Poverty and Famine: An Essay on Entitlement and Deprivation. *Clarendon Press*, Oxford.

Shankar, K. (2004). How Efficient RPDS in Tribal Area?. *Economic and Political Weekly*, 39 (41), pp. 2093- 2098.

Sharma, K. (2003). Food Security: Some Related Issues. *Sonali Publishing House*, New Delhi.

Sharma, A., P. Ghate, L. Joshi & A. Sahu (2009). Study on Evaluating Performance of national Rural Employment Guarantee Act. *NCAER-RIF Publication*.

S. Vandana (2001). Public Distribution System in Odisha; A Report on Food Panchayat. *The Hindu*, 30th May 2001, pp. 1.

S, Vandana & D. P. Nayak (2016). A Study on Nutritional Status of Tribal Women in Visakhapatnam District, Andhra Pradesh, India. *International Journal of Community Medicine and Public Health*, 3 (8), pp. 2049-53.

S. Vandana & G. Bedi (2002). Sustainable Agriculture and Food Security, the Globalization. *Sage Publication*, New Delhi.

S. H. Suresh, M. Grithlare & M. S. Das (2014). Nutritional Status among Females of Bhaina Tribe of Bilaspur, Chhattisgarh, India: An Anthropological Insight. *Journal of Anthropology*, Vol. 7.

Singh, A (2015). Agricultural Production and Cropping Pattern Change in India. *South Asian Journal of Multidisciplinary Studies*, 2 (2), pp. 2349-2358.

Singh, A. & B. N. Sadangi (2012). Traditional Foods of Tribal Households of Southern Odisha. *Asian Journal of Home Sciences*, 7 (2), 567-570.

Singh, M. (2011). Sustainable Food Security; the Coverage of Indian Agri-input Sector. National Seminar on Food Security. *ANGURU,* Hyderabad.

Singh, S. P. (2013). Supply-side Challenges of the National Food Security Bill. *Kurukshetra*, November, 62 (1), pp. 3-7.

Sihna, R. & M. Lakra (2005). Wild Tribal Food Plants of Odisha. *Indian Journal of Traditional Knowledge*, 4 (3), pp. 246-252.

S. Savneet (2016). India's Changing Consumption Pattern. *Gyanapartha-ACCMAN Journal of Management*, 5 (2), pp. 23-30.

Singh, R. S. (2011). Enhancement of Food and Nutritional Security Through post-harvest in Tribal, Backward and Hill Regions of India. National Seminar on Food Security. *ANGURU*, Hyderabad, May 23-25.

Shah, A., S. K. Nayak, & B. Das (2008). Remoteness and Chronic Poverty in a Forest Region of Southern Odisha: A Tale of Entitlement Failure and State Apathy. *Chronic Poverty Research Centre Working Paper No. 34.*

Sihna, S. K., P. Nanda, & S. N. Biswal (2013). Socio-Economic and Resource Profile Analysis Bilaikani Village. *Research Bulletin No. 60, DWM*, Bhubaneswar, pp. 35.

Sihna, M. K., P. Nanda, & A. Kumar (2011). Dynamics of Poverty Food Insecurity in Orissa: Macro Analysis and Case Studies. *MPRA Paper*, No. 55543.

Staatz, J. M., D' Agostino VC (1990). Measuring Food Security in Africa: Conceptual, Empirical, and Policy Issues. *American Journal of Agricultural Economics*, 72 (5), pp.1311-1317.

Suba Rao, K. et al. (1997). 'Safety Net Programmes and Poverty Reduction: Lessons from Cross-country Experience'. *World Bank*, Washington DC.

Surynarayana, M. H. (1994). Urban Bias in Public Distribution System. *Economic and Political Weekly*, 29 (9), pp. 510-512.

Suryanarayana, M. H. (1995). In Pursuit of Food Security. *Economic and Political Weekly*, 30 (35), pp. 2178-2179.

Surnyanaraya, M. H. (1996). 'Food Security and Calorie Adequacy across States: Implications for Reforms'. *Journal of Indian School of Political Economy*, 3 (2), pp. 55-67.

Swaminathan, M. (2002). Strategies towards Food Security. *Social Scientist*, 31 (3/4), pp. 34-48.

Swaminathan, M. (2003). Neo-liberal Policy and Food Security in India: Impact on the Public Distribution System. *Economic and Political Weekly*, 10 (18), pp. 124-135.

Swindale, S. & P. Blinisky (2005). Household Dietary Diversity Score (HDDS) for Measurement of Household Food Access Indicator Guide. Version 2, *Food and Nutrition Technical Assistance*, Washington DC.

Taneja, V. P. & M. Saxena (1998). Nutritional Anthropometric of Bhil Women in Jhabua District of Madhya Pradesh. *Indian Journal of Nutritional Diet*, 35 (4), pp. 98-102.

Tarozzi, A. (2005). The Indian Public Distribution System as a Provider of Food Security: Evidence from Child Nutrition in Andhra Pradesh. *European Economic Review*, 49 (5), pp. 1305-1330.

Tripathy, D. & J. K. Mishra (2004). Seasonality and Food Security: A Programme for Food Security for All. *DJ Research Consultancy for Planning and Coordination Department*, Orissa.

Tripathy, D. & J. K. Mishra (2004b). "Poverty Reducing Growth Strategies: Desirable Patterns of sectoral Investments to Maximize Equity Oriented Growth." *DJ Research and Consultancy and Poverty Task Force*, Orissa.

USAID (1992). Policy Determination 19, Definition of Food Security. April 13, 1992, *Washington DC*, USAID.

UN World Food Programme (2008). Food Security Atlas of Rural Odisha. *Institute of Human Development*, New Delhi.

UNICEF (2011). Food and Nutrition Security Monitoring and Analysis System; A Review of Five Countries (Indonesia, Madagascar, Malwai, Nepal, Zambia), *UNICEF*, New York.

Valentine et al. (2012). 'Food and Fuel; the use of Land for Lignocelluloses' Next Generation Energy Crops That Minimize Competition with Primary Production. *GCB Bioenergy*, 4 (1), pp. 1-19.

Vo, Braun, J., H. S. Kumar & Pandya-Lorch, R. (1992). Improving Food Security of the Poor: Concept, Policy, and Programme. *International Food Policy Research Institute*, IFPRI.

Vyasa, V. S, (2001). Economic Policies for Ensuring Food Security. *Gyan Publishing House*, New Delhi.

Webb, P., J. Coates, E. A. Frongillo, B. L. Rogers, A. Swindale, and W. S. Wolfe (2001). "Building Household Food Security Measurement Tools from the Ground up." Food and *Nutrition Bulletin*, 22 (1).

Webb, P., J. Coates, E. A. Frongillo, B. L. Rogers, A. Swindale and P. Bilinsky (2006). "Measuring Household Food Insecurity; Why it's so Important and yet so Difficult to do." *Journal of Nutrition*, 136, pp. 1404S-1408S.

World Bank (2004). Directions in Development; Agriculture and Poverty Reduction. Agriculture and Rural Development Department, *World Bank*, Washington DC.

World Bank (1996). 'India's Public Distribution System: A national and International Perspective', Poverty and Social Poverty Department, November (Reprinted as Radhakrishna, R. and Subarao, K. 1997, *World Bank Discussion Paper*, No. 380.

World Development Report (2006). Equity and Development. *A Co-publications of World Bank and Oxford University Press*. New York.

World Food Programme and Institute of Human Development (2008). *Food Insecurity Atlas of Rural India, Technical Report.* MSSRF, Chennai.

World Health Organization (1983). 'Measuring Change in Nutritional Status Guidelines for assessing the Nutritional Impact of Supplementary Feeding Programmes for Vulnerable Groups'. Geneva. *WHO*.

Xaxa, J. (2014). Problem of Food Security. A brief Analysis of Tribal Area in India. *International Journal of Scientific and Research Publication*, 4 (11), pp. 1-4.

Questionnaire on

Food and Nutrition Security in Odisha- A Case Study of Three Villages of KBK Region

1- Name of the Head of Households:

2- Name of the Village:

3- Name of the Block:

4- Name of the District:

5- Details of the Households:

Sr. No.	Name. of the HHs	Relation to Head of HHs	Types of Family	M/ F	Age (year)	Marital Status	Rural/ Urban	Religion	Caste	Type of House	Cooking Source
1											
2											
3											
4											
5											
6											
6											
7											
8											
9											

Codes for Relationship: Self **(1)** / Wife **(2)** /Son or daughter **(3)** /Son in law or daughter in law/ **(4) /**Grandchild **(5)** /Parent in law **(6)** / Brother or sister **(7)** /Parent **(8)/**Brother or sister in law **(9)** /Niece or nephew **(10)** /Other **(11)** /None **(12)**

Type of Family: Nuclear **(1)** / Joint **(2)**

Gender: Male **(1) /**Female **(2)**
Age-, 25, 30, 35, 40, 45, 50, 55, 60 and above

Marital Status: Unmarried **(1)** /Married **(2)** /Widow or Widower **(3)** /Divorced **(4)** /Separated **(5)**

Marital Status: Unmarried **(1)** /Married **(2)** /Widow or Widower **(3)** /Divorced **(4)** /Separated **(5)**

Urban / Rural Status: U **(1)** /R **(2)**

Main Fuel used for Cooking: LPG **(1)** /Electricity **(2)** /Kerosene **(3)** /Wood **(4)** /Dung **(5)** /others (Please Specify)

6- Family Size of the Households in the Sample Villages of Two Districts:

Family Size (in Numbers)	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi Village	Tikarpadar Village	Total
1-3				
3-6				
6-9				
9 and above				
Total				

7- Head of the Households in the Sample Villages of Two Districts:

Households Headed by	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi Village	Tikarpadar Village	Total
Male				
Female				
Total				

8- Socio-religious Status of Households in the Sample Villages of Two Districts:

Type of Family	Balangir District	Rayagada District		Total
	Babjore Village	Bhitarapadamajhi	Tikarpadar	
Nuclear				
Joint				
Total				
The Religion of the Households				
Hindu				
Christian				
Total				
Caste of the Households				
ST				
SC				
OBC				
General				
Population Composition				
Total				

Populations	Balangir District	Rayagada District		Total
	Babjore Village	Bhitarapadamajhi	Tikarpadar	
Male				
Female				
Boys				
Girls				
Total				

9- Sex-wise Educational Status of the Household Members in the Sample Village of Two Districts:

		Sex-wise Education- Balangir District					Total
Babjore Village	Male	Illiterate	Primary	Below Matric	Intermediate	Graduation	
	Female						
	Total						
Sex-wise Education -Rayagada District							
Bhitarapadamajhi Village	Male	Illiterate	Primary	Below Matric	Intermediate	Graduation	**Total**
	Female						
	Total						
Tikarpadar Village	Male						
	Female						
	Total						
Grand Total							

10- Type of Land of the Households in the Sample Villages of Two Districts:

Types of Land	Balangir District	Rayagada District		Total
	Babjore Village	Bhitarapadamajhi	Tikarpadar	
Irrigated		-	-	-
Non-irrigated				
Barren				
Fallow				
Landless				
Total				

11- Sex-wise Occupational Structure of the Households in the Sample Villages of Two District:

		Occupational Structure- Balangir District						
		Agri. Cultivators	Agri. Labourers	Wage Laborers	Business	Services	Other Occupations	**Total**
	Male							
	Female							
Babjore Village	**Total**							
Rayagada District								
		Agri. Cultivators	Agri. Labourers	Wage Laborers	Business	Services	Other Occupations	**Total**
	Male							
	Female							
Bhitarapadamajhi Village	**Total**							
	Male							
	Female							
Tikarpadar Village	**Total**							
Grand Total								

12- Major Sources of Income of the Households in the Two Villages in a Year (in Rupees):

Sources of Income (in Rs.)	**Balangir District**	**Rayagada District**		**Total**
	Babjore Village	**Bhitarapadamajhi**	**Tikarpadar**	
Agriculture				
Forest Products				
Wage Labour				
Other Occupations				
Total				

13- Wage Status of the Household Members in the Sample Villages:

Wage (In Rupees))	**Balangir District**	**Rayagada District**		**Total**
	Babjore Village	**Bhitarapadamajhi**	**Tikarpadar**	
Less than 100				
100-150				
150-200				
200 and above				
Total				

14- Distribution of Households based on income in the Sample Villages of Two Districts (Per Year):

Income Groups (in Rupees)	Balangir District	Rayagada District		Total
	Babjore Village	Bhitarapadamajhi	Tikarpadar	
Below 10000				
10000-15000				
15000-20000				
20000 and above				
Total				

15- Saving Status of the Households in the Sample Villages of Two Districts:

Saving (Rs.)	Balangir District	Rayagada District		Total
		Bhitarapadamajhi	Tikarpadar	
Less than 1,000				
1000-2000				
2000-3000				
3000 and above				
Don't save				
Total				

16- Major Crops cultivated by the Households in the Sample Villages of Two Districts:

Main Crops	Balangir District	Rayagada District		Total
	Babjore Village	Bhitarapadamajhi	Tikarpadar	
Paddy				
Cereals				
Others				
Landless				
Total				

17- Area under Different Crops among the Households in the Sample Villages of Two Districts:

Variety of Crops Cultivated	Balangir District (Babjore Village)	Rayagada District		
	Land Allotted to Different Crops (In Acres)	Bhitarapadamajhi Village (In Acres)	Tikarpadar Village (In Acres)	Total
Paddy				
Millets				
Bajra				
Mandia				
Red Grams				
Vegetables				
Cotton				
Total Cultivated Land Area				

18- Distribution of Costs of Production in the Sample Villages per year in Rupees:

Types of Crops	**Costs of Cultivation- Bagjore Village (in Rupees)**				
	Labour Costs	Input Costs	Harvesting Costs	Other Costs	Total Costs
Paddy					
Cereals					
Other Crops					
Total					
Types of Crops	**Costs of Cultivation– Bhitarapadamajhi Village (in Rupee)**				
	Labour Costs	Input Costs	Harvesting Costs	Other Costs	Total Costs
Paddy					
Cereals					
Other Crops					
Total					
Types of Crops	**Costs of Cultivation -Tikarpadar Village (in Rupees)**				
	Labour Costs	Input Costs	Harvesting Costs	Other Costs	Total Costs
Paddy					
Cereals					
Other Crops					
Total					

19- Food Grains Production and Requirements of Households in the Sample Villages of Two Districts:

Bagjore Village (Per Year and in Quintals)							
Family Size	Home Production	From Market	From PDS	From Others	Actual Total Consumption	Actual Total Requirements	Difference /Gap
1-3							
3-6							
6-9							
Above 9							
Family Size	**Bhitarapadamajhi Village (Per Year and in Quintals)**						
	Home Production	From Market	From PDS	From Others	Actual Total Consumption	Actual Total Requirements	Difference /Gap
1-3							
3-6							
6-9							
above 9							
Family Size	**Tikarpadar Village (Per year and in Quintals)**						
	Home Production	From Market	From PDS	From Others	Actual Total Consumption	Actual Total Requirements	Difference /Gap
1-3							
3-6							
6-9							
Above 9							

20- The Most Important Reasons for not taking Meals in a Day in the Sample Villages of Two Districts:

Reasons	**Balangir District**	**Rayagada District**		**Total**
	Babjore Village	**Bhitarapadamajhi**	**Tikarpadar**	
Lack of availability of food				
Lack of purchasing power				
Other reasons				
Total				

21- Type of Households in Sample Villages of Balangir and Rayagada District:

Type of Households	Balangir District	Rayagada District		
	Bagjore Village	Bhitarapadamajhi	Tikarpadar	Total
Poor				
Non- poor				
Total				

22- Type of Ration Cards possessed by the Households in Sample Villages of both Districts:

Type of Ration Cards	Balangir District	Rayagada District		
	Bagjore Village	Bhitarapadamajhi	Tikarpadar	Total
BPL				
APL				
No Cards				
Total				

23- Targeting Errors of Sample Villages of Balangir and Rayagada Districts:

Targeting Errors	Balangir District	Rayagada District		
	Babjore Village	Bhitarapadamajhi	Tikarpadar	Total
Exclusion Errors				
Inclusion Errors				
Actual Poor People Benefited				

24- Total Consumption of Food Grains of the Households/Month in Sample Villages (Kg.):

Food Items	Bagjore Villages		
	Home	Out Side	Total
Rice (Kgs)			
Cereals (Kgs)			
Dals (Kgs)			
Pulses (Kgs)			
Edible oils (ltrs)			
Milk (ltrs)			
Fruits			
Sugar (Kgs)			
Vegetables			
Fishes (Kgs)			
Eggs (Numbers)			
Meat (Kgs)			
Others (kg)			

25- Nutrition Chart of Calorie, Protein, and Fat from Food Items:

Major Food Items	Calories Per Unit (Kcal)	Protein Per Unit (gram)	Fat Per Unit (gram)
Rice (1kg)			
Cereals (1kg)			
Dal (1kg)			
Pulses (1kg)			
Edible oil (kg)			
Milk (1lt)			
Fruits (1kg)			
Sugar (1kg)			
Vegetable (1kg)			
Fishes (1kg)			
Eggs (numbers)			
Meat (kg)			
Others			
Total			

26- Calorie, Protein, and Fat per Person per Day in Sample Villages of Two Districts:

Major Food Items	Sample Villages				
	Per day (Four people)	Per person	Calorie	Protein	Fat
Rice (kgs/gm)					
Cereals (gms)					
Dal (gms)					
Pulses (gms)					
Edible oils (mls)					
Milk (mls)					
Fruits (gms)					
Sugar (gms)					
Vegetables (gms)					
Fishes (gms)					
Meat (gms)					
Others (gms)					
Total					

27- Households Members meet & do not meet the Required Calorie, Protein, and Fat in the Two Districts:

Gender	**Sample Villages**						
	Adult attained calorie	The adult do not attain	Total	**Gender**	Children attained calorie	Children do not attain	Total
Male				**Boys**			
Female				**Girls**			
Total				**Total**			

28- Body Mass Index based on RDA according to ICMR Norms in the Sample Villages of Two Districts:

Children of the Households						
Boys				Girls		
Weight (Kg)	Height (Cm)	BMI	Age (Years)	Weight (Kg)	Height (Cm)	BMI
21.7	107.8	18.6	4+	18.9	101.7	18.2
24.9	108.2	21.8	5+	20.5	110.6	16.7
24.1	115.9	17.9	6+	23.9	118.9	19.9
30.9	119.9	21.5	7+	26.8	116.8	19.6
29.4	128.8	17.7	8+	25.2	122.6	16.7
36.9	137.5	19.5	9+	33.9	130.5	19.9
40.7	142.9	19.9	10+	37.7	140.9	18.9
44.5	147.6	20.4	11+	40.8	144.7	19.4
41.2	152.7	17.6	12+	43.7	150.6	19.2
51.9	157.4	20.9	13+	45.4	153.9	19.1
54.5	163.5	20.4	14+	46.5	159.8	18.2

29- Percent of People are Under-nutrition, Normal & Overweight in the Two Districts:

	Sample Villages (Percent of People)					
	Children			Adult		
Nutrition Security	**Boys**	**Girls**	**Total**	**Man**	**Woman**	**Total**
Under Nutrition <18.5						
Normal 18.5-24.9						
Overweight >25-29.9						
Total						

30- Major Sources of Drinking Water in the Sample Villages of Two Districts:

	Sample Villages		
Source of Drinking Water	Rainy	Winter	Summer
Tub well			
Bore well			
Streams			
Total			

31- Factors Determining the Status of Absorption in the Sample Villages:

Factors	Balangir District	Rayagada District		Total (% of H.Hs having facilities)
	Bagjore Village (% of H.Hs having facilities)	**Village-1** (% of H.Hs having facilities)	**Village-2** (% of H.Hs having facilities)	
Having safe drinking water				
Accessing PHCs				
Having toilet facilities				
Do not have any facilities				
Total				

32- Precaution taken by Pregnant Women for Last One Year in the Sample Villages:

Nature of precaution	Balangir District	Rayagada District		Total
	Babjore Village	**Village-1**	**Village-2**	
		% of precaution taken	**% of precaution taken**	
Food Supplements				
Immunization				
Anti-natal check-up				
Not taken				
Total				

33- Immunization among Children below Fourteen Years Old in the Sample Village of Two Districts:

Vaccines	Sample Villages (Percent of Children)		
	Boys	**Girls**	**Total**
Polio			
Others			
Did not take			
Total			

34- Children (3-6 years) are receiving Health Care Facilities in AWCs in the Sample Villages:

Village	Children 3-6 Years of Age			Those are getting Benefits		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
Bagjore Village						
Villages	**Children 3-6 years of age**			**Those are getting benefits**		
	Boys	**Girls**	**Total**	**Boys**	**Girls**	**Total**
Village-1						
Village-2						
Total						

35- Children (5-15 years) in-School and Out-of-School in the Sample Village of Balangir District:

Age Groups	Bagjore Village					
	Total Children		**Children in School**		**Children out of School**	
	Boys	**Girls**	**Boys**	**Girls**	**Boys**	**Girls**
5-10						
10-15						
Total						

36- Livestock's owned by Households in the Sample Villages of Two Districts:

Livestock's owned by households	Balangir District	Rayagada District		Total
	Bagjore Village	**Village -1**	**Village-2**	
Goats/sheep				
Hens/ducks				
Cows				
Buffalos				
Others				
Do not own				
Total				

37- Structure of Houses of the Households in the Sample Villages of Two Districts:

Structure of Houses	Balangir District	Rayagada District		Total (No. of H.Hs)
	Babjore Village (No. of H. Hs)	Village-1 (No. of H.Hs)	Village-2 (No. of H.Hs)	
Concrete				
Tiled				
Asbestos				
Thatched				
Huts				
Total				

Thank You…….

ISSN No. 0975-6280

• Volume 13 • No. 1 • Jan - June 2017

JIM QUEST

Journal of Management and Technology

A Bi-annual Referred Research Journal of Jaipuria Institute of Management, Indirapuram, Ghaziabad

JAIPURIA INSTITUTE OF MANAGEMENT
EMPOWER • ENTHUSE • EXCEL

JAIPURIA INSTITUTE OF MANAGEMENT
Indirapuram, Ghaziabad

Public Distribution System in Odisha: A Study of two villages in the Mayurbhanj District

Prasanta Kumar Das*
Dr. G. Sridevi**

Abstract

Public Distribution System (PDS) is one of the most important welfare schemes of the government of India in providing subsidized food grains to the poor in the country. But the scheme has failed in providing relief to the poor due to various problems. In the case of Odisha the situation is worst in comparison to other states, where more than 60% people are food insecure. The study has tried to emphasize the importance of PDS and access by tribal people in two villages of Mayurbhanj district. The main findings of the study show that the maximum percentages of tribal people are excluded from TPDS scheme. That has contributed the food insecurity among the tribal people in two sample villages. The goal of PDS can be achieved by taking various initiatives and effective measures both by central government and state governments like reducing leakages, spreading awareness among the people, reducing corruption, and better governance that will provide a lasting solution to the above problem.

Keywords: *PDS, Income Gain, Targeting Errors, Tribal, Mayurbhanj, Odisha, Poverty*

Introduction

Ensuring food and nutrition security ought to be an issue of great importance for a country like India where starvation deaths occur in every minutes in the country, when there is plenty of food grains are rotting in the open field due of lack of adequate storage facilities (Dev, 1992). Hunger and malnutrition are the twin intimidating problems, which our country is facing in the twenty first century. In order to solve the above twin problem, government of India had initiated the distribution of food grains in the late 1960 and later PDS in the whole country. The main objectives of the scheme was to protect the people from the impact of rising prices of the basic commodities and it acts as an instrument for price stabilization in the urban areas of the country. Now it is considered as an essential element of the government safety net for the poor in the country (Swaminathan, 1989). In other words it provides food grains and other essential commodities to the poor people at most reasonable prices. It provides essential items like rice, wheat, edible oils, sugar, kerosene and coal at reasonable prices. PDS is one of the largest network programmes in the world in terms of providing cheaper foods and food security to the poorest of the poor. Though India has successful in achieving self-sufficiency at macro level by increasing its food production but it could not solve the problem of chronic household food insecurity till today (FAO, 2006).

Odisha is known for its wrong reasons not only in the country but also in the world for its backwardness and underdeveloped. It lags behind from other states in socio-economic parameters like poverty, employment, literacy and health. But the more threatening problem is that, the majority people suffer from acute malnutrition, hunger, starvation deaths and food and nutrition insecurity, even though the state produces enough food for its people. It is due to the unequal distribution of food and lack of purchasing power among the people (Mahamalik, 2004). In other words, the situation varies significantly within the state. The Mayurbhanj district where the study has taken place is one of leading tribal district in the state and around 58% are tribal of the district's total population. There are lot of deaths are being reported in the various news papers. This district is the worst victims of food insecurity because of the failure of various welfare schemes and denial of forests rights (Sarap, 2003). The prolonged unemployment, marginalization, poverty and hunger force the people to migrate to other states in search for employment and livelihoods. Moreover, the frequency of natural disasters like cyclone and drought is again making the people more vulnerable and food insecure in the district.

Review of literature

There are lot of studies have been carried out by different authors on different issues of PDS. A study by Dev (1996) argued

*Doctoral Research Scholar, School of Economics, University of Hyderabad, Hyderabad – 500046. Email: dasprasanta1987@gmail.com
**Assistant Professor, School of Economics, University of Hyderabad, Hyderabad – 500046.

ISSN: 2394 -1782
RNI: APENG/2014/57359
Approved by UGC

Desh Vikas

Volume: 4 Issue: 2 July - September 2017

ISSN 2394 -1782

Editorial Board

Editor

Desh Vikas ISSN 2394-1782
Vol: 4 Issue: 2 July –September 2017

Socio-Economic Conditions of the Tribal People in Odisha with Special Reference to Rayagada District

[1]Dr. G. Sridevi and [2]Prasanta Kumar Das

[1]Assistant Professor, School of Economics, University of Hyderabad, Hyderabad, Telangana State, India

[2]Ph.D. Scholar, School of Economics, University of Hyderabad, Hyderabad, Telangana State, India

ABSTRACT

Odisha, being socio-economically backward state but sound in traditional culture is one of the important states in eastern India. Out of 30 districts, nine are considered as tribal districts and the share of ST population is 24.4 percent of state's total population. They are also one of the most backward and geographically isolated communities in the country. Their lifestyle and economy are confined to the direct utilization of natural resources, the pre-agricultural level of technology and specific indigenous type of work. Keeping this in the backdrop, the present study tries to explore the changing scenario of the socio-economic condition in the tribal areas of the state. In this regard, various socio-economic indicators have been analyzed among the primitive tribal households in the study area. In addition, Rayagada has also been taken as a case study to represent the socio-economic condition. The overall objective of this study is to obtain a better understanding of the disparities and variations in socio-economic status in Rayagada District and also find out some remedial measures to overcome the problems to bring the primitive tribal community in the mainstream of the society.

Keywords: *Primitive Tribe, Dangaria Kondha, Socio-Economic Condition, Rayagada District, and Odisha*

I. Introduction

The tribal societies in India are considered as the weakest sections of the population in terms of common socio-economic and demographic factors such as poverty, illiteracy, lack of developmental facilities and adequate primary

NATIONAL ECONOMICS CONFERENCE – 2013

¥€$
The Young Economist School

This is to certify that ~~Ms~~./Mr. Prasanta Kumar Das of University of Hyderabad has presented ~~her~~/his ongoing research work on Public Distribution System in Odisha at the National Economics Conference organized by the Young Economist School at the University of Hyderabad from 10th May, 2013 to 12th May, 2013.

Chief Coordinator
NEC 2013, YES

Prof.J.V.M Sarma
Faculty Coordinator

BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY
"LUCKNOW"
ESTABLISHED 1996

INDIAN SOCIETY OF AGRICULTURAL MARKETING 1986 ISAM

INDIAN SOCIETY OF AGRICULTURAL MARKETING, HYDERABAD
DEPARTMENT OF ECONOMICS, BABASAHEB BHIMRAO AMBEDKAR UNIVERSITY, LUCKNOW

CERTIFICATE

This is to certify that Prof/Dr/Ms/Mr. ...Prasanta D.S. Kumar.....

From .....HCU..... *has participated/Chairman/Co-Chairman /Presented a research paper entitled* .....Economic Contribution of Tourism in India..... *through online/offline in 34th National Conference of Agricultural Marketing organised by the Department of Economics, Babasaheb Bhimro Ambedkar University, Lucknow and Indian Society of Agricultural Marketing, Hyderabad during 16th - 18th March 2021.*

Dr. T. Sathyanarayana
Secretary
Indian Society of Agricultural Marketing)

Prof. L.C. Mallaiah
Organising Secretary
34th National Conference of ISAM

AMITY UNIVERSITY
UTTAR PRADESH

AMITY SCHOOL OF ECONOMICS

VIRTUAL 4TH NATIONAL CONFERENCE

ON

SUSTAINABLE DEVELOPMENT GOALS: LESSONS AND CHALLENGES IN THE VUCA WORLD

18th-19th March, 2021

CERTIFICATE OF PARTICIPATION

This is to certify that **Prasanta Das**

from **University of Hyderabad** participated/presented a paper titled

Issues of Socio-Economic Conditions of the Tribal People in Odisha with Special Reference to Rayagada District during the **Virtual 4th National Conference on Sustainable Development Goals: Lessons and Challenges in the VUCA World organized by Amity School of Economics** from 18th-19th March 2021.

Dr. Neeru Sidana
Conference Convener
Asst. Professor III

Dr. Kavita Indapurkar
Conference Chair
Joint Administrator

Prof (Dr.) Balvinder Shukla
Vice Chancellor, AUUP

Sponsor: CE CODE EFFORT PVT. LTD

Partners:

Food and Nutrition Security in Odisha: A Case Study of Three Villages of KBK Region

by Prasanta Kumar Das

Submission date: 02-Dec-2021 10:11AM (UTC+0530)
Submission ID: 1718105407
File name: Prasanta_Kumar_Das.docx (11.38M)
Word count: 63911
Character count: 334431

Food and Nutrition Security in Odisha: A Case Study of Three Villages of KBK Region

ORIGINALITY REPORT

7%	6%	3%	1%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	ageconsearch.umn.edu Internet Source	1%
2	documents.wfp.org Internet Source	<1%
3	www.fao.org Internet Source	<1%
4	ir.amu.ac.in Internet Source	<1%
5	docplayer.net Internet Source	<1%
6	www.igidr.ac.in Internet Source	<1%
7	"Agriculture, Food and Nutrition Security", Springer Science and Business Media LLC, 2021 Publication	<1%
8	tind-customer-agecon.s3.amazonaws.com Internet Source	<1%

9	edepot.wur.nl Internet Source	<1 %
10	www.researchgate.net Internet Source	<1 %
11	www.ihdindia.org Internet Source	<1 %
12	www.manage.gov.in Internet Source	<1 %
13	"Zero Hunger", Springer Science and Business Media LLC, 2020 Publication	<1 %
14	hdl.handle.net Internet Source	<1 %
15	www.nutritioncoalition.org.in Internet Source	<1 %
16	www.nutritionsocietyindia.org Internet Source	<1 %
17	researchspace.ukzn.ac.za Internet Source	<1 %
18	ietd.inflibnet.ac.in Internet Source	<1 %
19	cora.ucc.ie Internet Source	<1 %
20	www.unicef.org	

	Internet Source	<1%
21	Andaleeb Rahman. "Universal food security program and nutritional intake: Evidence from the hunger prone KBK districts in Odisha", Food Policy, 2016 Publication	<1%
22	ueaeprints.uea.ac.uk Internet Source	<1%
23	shodhganga.inflibnet.ac.in Internet Source	<1%
24	www.villagesquare.in Internet Source	<1%
25	wocatpedia.net Internet Source	<1%
26	Submitted to Ambedkar University Delhi Student Paper	<1%
27	www.shanlaxjournals.in Internet Source	<1%
28	mpra.ub.uni-muenchen.de Internet Source	<1%
29	fas.org.in Internet Source	<1%
30	www.scribd.com Internet Source	<1%

31	Submitted to Odisha State University Student Paper	<1 %
32	"Land and Livelihoods in Neoliberal India", Springer Science and Business Media LLC, 2020 Publication	<1 %
33	www.mec.af Internet Source	<1 %
34	www.in.undp.org Internet Source	<1 %
35	cgclimatechange.com Internet Source	<1 %
36	203.64.245.61 Internet Source	<1 %
37	vdsa.icrisat.ac.in Internet Source	<1 %
38	Submitted to University of Sydney Student Paper	<1 %
39	Anna Ferro‐Luzzi, N. G. Norgan, J. V. G. A. Durnin. "The nutritional status of some New Guinean children as assessed by anthropometric, biochemical and other indices", Ecology of Food and Nutrition, 2010 Publication	<1 %
40	www.ncbi.nlm.nih.gov Internet Source	

		<1 %
41	azdoc.site Internet Source	<1 %
42	www.rvnl.org Internet Source	<1 %
43	Regina Helena Rosa Sambuichi, Ana Flávia Cordeiro Souza de Almeida, Gabriela Perin, Paulo Asafe Campos Spínola et al. "The Food Acquisition Program (PAA) as a strategy to face the challenges of COVID-19", Revista de Administração Pública, 2020 Publication	<1 %
44	cbps.in Internet Source	<1 %
45	moam.info Internet Source	<1 %
46	www.ijmp.jor.br Internet Source	<1 %
47	icrier.org Internet Source	<1 %
48	planningcommission.gov.in Internet Source	<1 %
49	Manoj Kumar Dash. "An Analysis of Food Expenditure in Orissa:An Econometric	<1 %

Analysis", Review of Professional Management- A Journal of New Delhi Institute of Management, 2006
Publication

50	aajeevika.gov.in Internet Source	<1 %
51	doi.org Internet Source	<1 %
52	meteor.aihw.gov.au Internet Source	<1 %
53	planningcommission.nic.in Internet Source	<1 %
54	www.coursehero.com Internet Source	<1 %
55	Daniel Maxwell, Richard Caldwell, Mark Langworthy. "Measuring food insecurity: Can an indicator based on localized coping behaviors be used to compare across contexts?", Food Policy, 2008 Publication	<1 %
56	icar-nrri.in Internet Source	<1 %
57	Submitted to Rajiv Gandhi National Institute of Youth Development Student Paper	<1 %

agriodisha.nic.in

58	Internet Source	<1%
59	magazines.odisha.gov.in Internet Source	<1%
60	Alok Asthana, Sushil Kumar. "Soil Health and Sustainable Crop Production: Adoption and Awareness of Soil Testing", Journal of Sustainable Agriculture, 2008 Publication	<1%
61	Prakash Shetty. "Incorporating nutritional considerations when addressing food insecurity", Food Security, 10/20/2009 Publication	<1%
62	bmcpublichealth.biomedcentral.com Internet Source	<1%
63	reliefweb.int Internet Source	<1%
64	www.crcp.org.pk Internet Source	<1%
65	www.managementparadise.com Internet Source	<1%
66	Marshall Burke, David Lobell. "Chapter 2 Climate Effects on Food Security: An Overview", Springer Science and Business Media LLC, 2010 Publication	<1%

67	Submitted to University of Cape Town Student Paper	<1 %
68	oar.icrisat.org Internet Source	<1 %
69	socialwelfare.bih.nic.in Internet Source	<1 %
70	Ranjan Ray. "Household Behaviour, Prices, and Welfare", Springer Science and Business Media LLC, 2018 Publication	<1 %
71	s3.amazonaws.com Internet Source	<1 %
72	www.downtoearth.org.in Internet Source	<1 %
73	"Covid-19 Pandemic and Economic Development", Springer Science and Business Media LLC, 2021 Publication	<1 %
74	India Studies in Business and Economics, 2015. Publication	<1 %
75	cwww.intechopen.com Internet Source	<1 %
76	fpmu.gov.bd Internet Source	<1 %

77	www.ajol.info Internet Source	<1%
78	www.hsj.gr Internet Source	<1%
79	Submitted to Curtin University of Technology Student Paper	<1%
80	Lisa C. Smith. "The geography and causes of food insecurity in developing countries", Agricultural Economics, 3/2000 Publication	<1%
81	Lynn McIntyre, Krista Rondeau, Sharon Kirkpatrick, Jennifer Hatfield, Khaled Shamsul Islam, Syed Nazmul Huda. "Food provisioning experiences of ultra poor female heads of household living in Bangladesh", Social Science & Medicine, 2011 Publication	<1%
82	www.tandfonline.com Internet Source	<1%
83	"Disaster Management for 2030 Agenda of the SDG", Springer Science and Business Media LLC, 2020 Publication	<1%
84	China Agricultural Economic Review, Volume 5, Issue 1 (2013-01-29) Publication	<1%

85 K. Radhakrishna Murty. "Food Security Eludes Tribals of Andhra Pradesh", Social Change, 2018 <1%

Publication

Exclude quotes	On	Exclude matches	< 14 words
Exclude bibliography	On		