

# FOOD SECURITY ATLAS OF RURAL JHARKHAND 2022



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RURAL JHARKHAND 2022**





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# FOREWORD

**T**he food security is extremely important to achieve the Sustainable Development Goal (SDG) of eliminating all kinds of malnutrition. The SDG target of 2.1 to end all kind of hunger and food insecurity has an all-and-effect relationship with other SDGs. The food security has wider connotation and has rightly been defined as a situation that exists when all people at all times have physical, social and economic access to nutritious food supported by an environment of adequate sanitation and health services.

India has made remarkable progress in achieving self-sufficiency in the production of foodgrains. However, in spite of progress the country has not been able to achieve food security for a significant section of population as defined above. Thanks to various government policies, the malnutrition has decreased but still is at an unacceptably high level.

The resource-rich state of Jharkhand has made significant progress in various fields after its formation as a separate state more than two decades ago. However, the state continues to be amongst the poorest in the country. The rural poverty is particularly widespread as evident from the fact that around 42 per cent of the rural population of the state as per the National Family and Health Survey (NFHS)-5 are multidimensionally poor. The malnutrition level in the rural Jharkhand is also high. In order to make significant dent on poverty in the state, eliminating food insecurity and providing people adequate access to nutritious food is a must. This requires focused and targeted policy interventions.

In this context, the publication of Food Security Atlas of Rural Jharkhand 2022 is very relevant. This Atlas prepared by the Institute for Human Development (IHD) is a part of the research initiative ‘System of Promoting Appropriate National Dynamism for Agriculture and Nutrition (SPANDAN)’ of the Indira Gandhi Institute of Development Research (IGIDR), Mumbai, supported by a grant of the Bill and Melinda Gates Foundation. Exploring the various dimensions of food security in terms of food availability, access and utilization, the Atlas analyses the of food security situation in rural Jharkhand at district level and suggest appropriate policy intervention. The latest available secondary data have been used and in spite of data constraints, the results of the study seem to be quite robust.

We hope that this Atlas will be useful in devising programmes and policies for improving food and nutrition security in Jharkhand, particularly for the rural areas. It will also be of interest and use to all the other stakeholders concerned with the issue of improving food and nutrition security in Jharkhand.

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# ABBREVIATIONS

<b>AAY</b>	Antodaya Anna Yojana
<b>ADI</b>	Average Daily Intake
<b>BMI</b>	Body Mass Index
<b>BPL</b>	Below Poverty Line
<b>CHCs</b>	Community Health Centres
<b>FAO</b>	Food and Agriculture Organization
<b>FNS</b>	Food and Nutrition Security
<b>FPS</b>	Fair Price Shops
<b>FSI</b>	Food Security Index
<b>FSO</b>	Food Security Outcome
<b>GHI</b>	Global Hunger Index
<b>GSDP</b>	Gross State Domestic Product
<b>GVA</b>	Gross State Value Added
<b>HCM</b>	Hot Cooked Meal
<b>ICDS</b>	Integrated Child Development Services
<b>IHD</b>	Institute for Human Development
<b>IMR</b>	Infant Mortality Rate
<b>JNM</b>	Jharkhand Nutrition Mission
<b>LPG</b>	Liquefied Petroleum Gas
<b>MAD</b>	Minimum Acceptable Diet
<b>MCP</b>	Mother and Child Protection
<b>MDD</b>	Minimum Dietary Diversity
<b>MGNREGA</b>	Mahatma Gandhi National Rural Employment Guarantee Act
<b>MMF</b>	Minimum Meal Frequency
<b>MoTA</b>	Ministry of Tribal Affairs
<b>MPCE</b>	Monthly Per Capita Consumption Expenditure
<b>MPI</b>	Multidimensional Poverty Index
<b>MRP</b>	Mixed Recall Period

<b>MSSRF</b>	MS Swaminathan Research Foundation
<b>NAMI</b>	Normalized Adult Malnutrition Index
<b>NCMI</b>	Normalized Child Malnutrition Index
<b>NFHS</b>	National Family Health Survey
<b>NFSA</b>	National Food Security Act
<b>NNM</b>	National Nutrition Mission
<b>NNMR</b>	Neonatal Mortality Rate
<b>NSS</b>	National Sample Survey
<b>NTFPs</b>	Non-Timber Forest Products
<b>PCA</b>	Principal Component Analysis
<b>PDS</b>	Public Distribution System
<b>PHC</b>	Primary Health Centre
<b>PHH</b>	Priority Household
<b>PLFS</b>	Periodic Labour Force Survey
<b>PM POSHAN</b>	Pradhan Mantri Poshan Shakti Nirman
<b>PTG</b>	Primitive Tribal Groups
<b>PVTGs</b>	Particularly Vulnerable Tribal Groups
<b>RDA</b>	Recommended Dietary Allowance
<b>REM</b>	Range Equalization Method
<b>SC</b>	Scheduled Caste
<b>SDG</b>	Sustainable Development Goal
<b>SHGs</b>	Self-Help Groups
<b>SOFI</b>	State of Food Security and Nutrition in the World
<b>SPSS</b>	Statistical Package for the Social Sciences
<b>ST</b>	Scheduled Tribe
<b>THR</b>	Take-Home Ration
<b>TPDS</b>	Targeted PDS
<b>U5MR</b>	Under-Five Mortality Rate
<b>UNDP</b>	United Nations Development Programme
<b>UNGA</b>	United Nations General Assembly
<b>UTs</b>	Union Territories
<b>VIP</b>	Ventilated Improved Pit
<b>WASH</b>	Water, Sanitation and Hygiene
<b>WFC</b>	World Food Conference
<b>WFP</b>	World Food Programme
<b>WFS</b>	World Food Security
<b>Y-o-Y</b>	Year-on-Year

# EXECUTIVE SUMMARY

## 1. Background

Food and nutrition security (FNS) can be defined as a situation that exists when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs, requirements for growth, and food preferences, and is supported by an environment of adequate sanitation, health services, and caregiving. It is critical for any society, and is a top priority in national and global developmental agendas. To achieve the Sustainable Development Goal (SDG) of eliminating all kinds of malnutrition, ensuring access to nutritious food is a must. The SDG target 2.1 to end hunger and food insecurity has a cause-and-effect relationship with other SDGs.

The state of Jharkhand, with a population of over 3 crores, has been at the forefront of growth stories among the Indian states in the recent past. Despite surging growth, poverty in the state is among the highest in the country. Food security and deprivation are of serious concern, particularly in the interior areas of the state. According to the National Multidimensional Poverty Index Baseline Report 2021, prepared by NITI Aayog, Jharkhand (42.2 per cent) has the second-highest multidimensional poverty among the Indian states. According to SDG India Index 2020-21, Jharkhand ranks second-worst in terms of overall SDGs while worst in zero hunger parameter. However, Jharkhand also reports significant progress in reducing multidimensional

poverty. The Multidimensional Poverty Index (MPI) for rural Jharkhand decreased from 0.246 in 2015-16 to 0.183 in 2019-2021, although the MPI for the state is still higher than that for rural parts of Chhattisgarh (0.12), Odisha (0.11), and the national average (0.10).

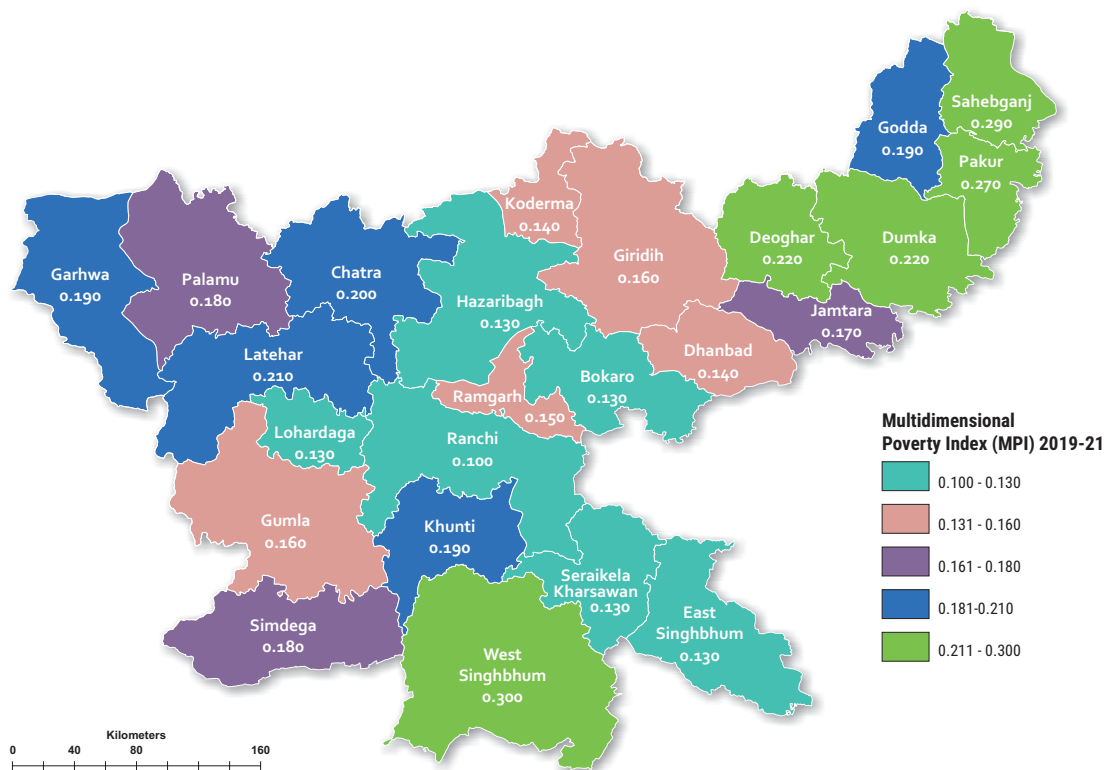
As per National Family Health Survey (NFHS)-5, more than 50 per cent of the rural population is multidimensionally poor in the districts of Sahibganj (59 per cent), Pashchimi Singhbhum (62 per cent) and Pakur (58 per cent), whereas less than 30 per cent of the rural population is multidimensionally poor in Ranchi district (26 per cent) during 2019-2021. The districts (rural) of Ranchi (0.100), Bokaro (0.130), Purbi Singhbhum (0.130), Saraikela-Kharsawan (0.130) show the lowest MPI, while the less developed districts such as Paschimi Singhbhum (0.300), Sahibganj (0.290), Pakur (0.270), Dumka (0.220) and Deoghar (0.220) have the highest MPI figures as per NFHS-5, 2019-2021 (ES Map 1).

## 2. Objective and Scope

The Institute for Human Development (IHD) had prepared a *Food Security Atlas of Rural Jharkhand* with support from World Food Programme (WFP) in 2008-09. The study had highlighted eight districts as requiring urgent attention for food security interventions in Jharkhand. The present study revisits the issue of food security in rural Jharkhand with the primary focus of identifying the extremely food insecure districts with main objectives of:



**ES Map 1: District-wise Multidimensional Poverty Index of Rural Jharkhand, 2019-2021**



Source: Computed by IHD Research Team from NFHS-5, 2019-2021.

- Exploring the dimensions, indicators, approach, and methods of measuring food security in terms of food availability, access, and utilisation.
- Analysing the nature and dynamics of the food security situation at the district level and identify the regions/districts which are most affected by food insecurity.
- Suggesting policy interventions appropriate to improving food security for the food insecure regions in rural Jharkhand.

This study conducted by the Institute for Human Development (IHD) is a part of the research initiative ‘System of Promoting Appropriate National Dynamism for Agriculture and Nutrition (SPANDAN) implemented by the Indira Gandhi Institute of Development Research (IGIDR). The study has used disaggregate-level data to examine the extent and dimensions of food security at the district level in rural Jharkhand using various indicators from latest secondary data sources.

**3. Key Findings**

The findings from this study shows that there are large inter-district inequalities across all the three dimensions of food security, i.e., availability, accessibility, and utilisation.

**Availability of Food**

The districts which are extremely food secure in terms of Food Availability Index are Ranchi, Purbi Singhbhum, Dhanbad, Latehar, and Hazaribagh. Except Dumka, the entire Santhal Pargana region (north-eastern part of Jharkhand) is food insecure to highly insecure with regards to food availability. Jamtara, Godda, Garhwa, Pakur, and Saraikela-Kharsawan districts are placed as highly food insecure with regards to food availability.

**Access to Food**

Almost the entire North Chotanagpur division, comprising districts of Hazaribagh, Koderma, Giridih, Ramgarh, Bokaro, and Dhanbad have

emerged as highly food secure in terms of access to food. The districts of Santhal Pargana region – Godda, Sahibganj, Jamtara, Dumka, and Pakur – are either highly insecure or insecure districts in terms of composite Access to Food Index. Simdega and Garhwa districts have also ranked as highly insecure in terms of access to food.

### Utilisation of Food

Ranchi, Purbi Singhbhum, Simdega, Saraikela-Kharsawan, and Gumla have emerged as the most food secure in terms of utilisation or absorption of food. On the other hand, districts of Khunti, Pakur, Ramgarh, Bokaro, and Pashchimi Singhbhum are found to be highly insecure in terms of Food Utilisation Index.

### Food Security Outcome

Almost all the districts of the Santhal Pargana division are insecure or highly insecure in terms of outcome of food security owing to very high percentage of

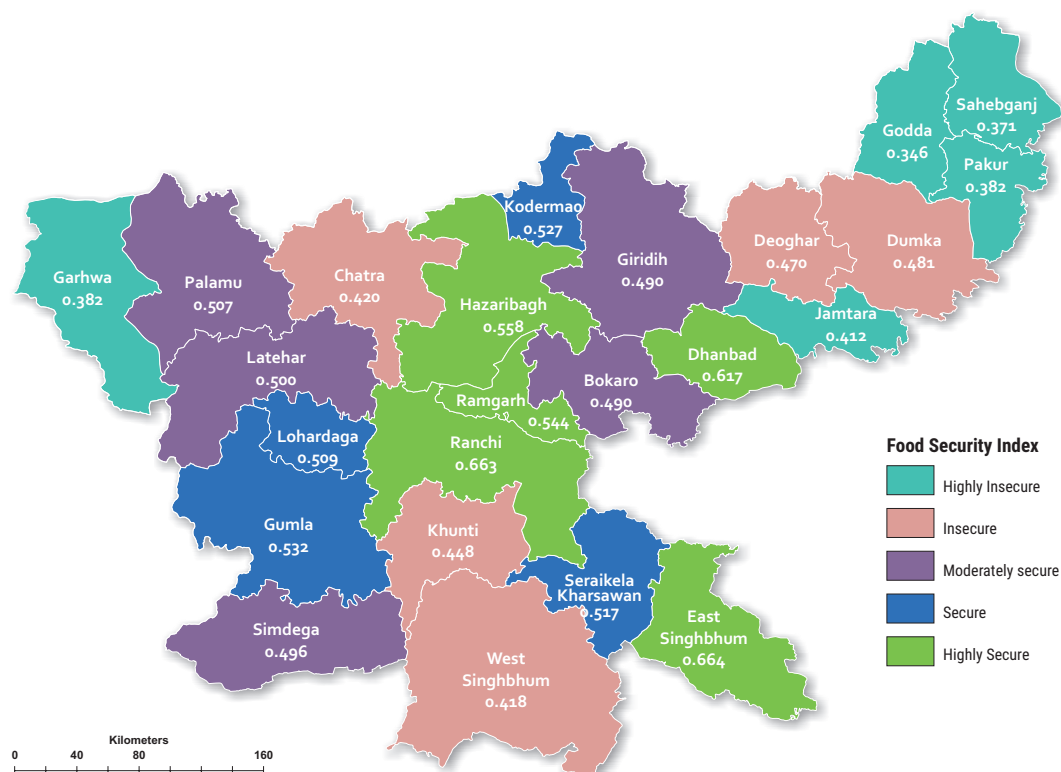
anaemic as well as underweight children. Districts of Jamtara, Dumka, Deoghar, Pakur, and Pashchimi Singhbhum are found to be highly insecure in terms of Food Security Outcome (FSO) Index of rural Jharkhand. On the other hand, districts of Hazaribagh, Ranchi, Kodarma, Giridih, and Gumla have emerged as highly secure in terms of food security outcome.

The results underline the fact that children in Jharkhand are at substantially higher risk of chronic and current malnutrition. Nearly 40 per cent of children under the age of five in Jharkhand suffered from chronic malnutrition (stunting), approximately 39 per cent were underweight, and 22 per cent suffered from wasting during 2019-2021 (NFHS-5).

### Status of Districts of Jharkhand in Food Security Index

The Food Security Index (FSI) is a composite index covering three dimensions, i.e., availability, access, and utilisation factors. Purbi Singhbhum, Ranchi,

**ES Map 2: District-wise Food Security Index of Rural Jharkhand**



Source: Computed and prepared by IHD Research team.

Dhanbad, Hazaribagh, and Ramgarh districts are highly food secure districts whereas Jamtara, Garhwa, Pakur, Sahibganj, and Godda are found to be the most food insecure. Godda, Sahibganj, and Pakur districts in the Santhal Pargana region collectively form the zone of high food insecurity (ES Map 2).

### Multidimensional Poverty and Food Security Indices

The MPI for rural areas at district level has significant correlation with the dimensional indices of food security, overall food security, and outcome indices. The MPI has a strong negative correlation with Access to Food Index and FSI at 1 per cent level of significance. On the other hand, MPI has a strong positive correlation with the FSO at 1 per cent degree of significance (ES Table 1).

### Priority Districts

The priority districts are those districts which fall in ‘insecure’ or ‘highly insecure’ categories in both FSI and FSO. The districts termed as ‘alarming’ are those which are ‘highly insecure’ either in FSO or FSI. The food insecurity situation of Dumka, Deoghar, Jamtara, Pakur, and Sahibganj from the Santhal Pargana region and Pashchimi Singhbhum district belonging to the Kolhan region have been marked as ‘alarming’.

Among the 24 districts of Jharkhand, 14 districts are on the priority list. Region-wise, the entire belt of the Santhal Pargana region has been marked as

‘alarming’ in terms of its food insecurity situation. All the districts of the Santhal Pargana region, except Godda, have been flagged off as exhibiting alarming levels of food insecurity based on both input and outcome indicators. Even Godda district from the Santhal Pargana region has been categorised among the districts ‘needing high attention’ in terms of food security input variables.

The districts of Jamtara, Godda, and Pakur suffer from poor food availability with per capita value of agricultural output (cereals) being low due to high rainfall variability coupled with low intensity of irrigation available. The urbanisation rates in these districts are also very low. The districts of Sahibganj, Dumka, Godda, Pakur, and Pashchimi Singhbhum suffer from poor access to food with monthly per capita consumption expenditure (MPCE) being very low owing to high percentage of agricultural labourers in Dumka, Godda and Sahibganj, casual wages being low and dependency ratio being high in Sahibganj, and percentage of scheduled tribes (STs) being high in Pashchimi Singhbhum who have an overall lower socio-economic condition. Lower proportion of villages have access to paved roads in Godda and Pakur.

The districts of Deoghar, Godda, Pakur, and Pashchimi Singhbhum suffer from poor utilisation of food with female literacy rates being low in Deoghar, Godda, Pashchimi Singhbhum, and Pakur, and access to improved toilet facility being poor in

**ES Table 1: Inter-correlation Matrix of Input and Output Components of Food Security with MPI**

	Availability	Access	Utilisation	FSI RE	Outcome	FSI PCA	MPI Rural
Availability	1						
Access	0.451*	1					
Utilisation	0.434*	0.010	1				
FSI REM	0.874**	0.689**	0.622**	1			
Outcome	-0.443*	-0.311	-0.382	-0.516**	1		
FSI PCA	0.422*	0.462*	0.372	0.573**	-0.321	1	
MPI Rural	-0.472*	-0.608**	-0.497*	-0.714**	0.752**	-0.474*	1

Note: \*–Correlation is significant at the 0.05 level (2-tailed);  
\*\*– Correlation is significant at the 0.01 level (2-tailed).

Source: Computed by IHD Research Team.

Pashchimi Singhbhum, Deoghar, and Pakur. Pashchimi Singhbhum additionally suffers from lack of access to safe drinking water and as a result exhibit high prevalence of diseases like diarrhoea which result in poor utilisation or absorption of food.

The most food-secure districts of Jharkhand are Purbi Singhbhum, Ranchi, Dhanbad, Hazaribagh, and Ramgarh. All these districts are mining-industrial, highly urbanised, and developed districts. Together, they form the development corridor of Jharkhand.

#### **4. Policy Variables and Implications for Policy**

The Atlas also identifies the critical variables which need utmost attention for ensuring food security in rural areas of Jharkhand. The findings reveal that in Jharkhand, per capita value of agricultural output in terms of cereals, percentage of casual labourers in non-agricultural pursuits, female literacy rate, availability of basic health infrastructure in rural areas measured here in terms of number of Primary Health Centres (PHCs)/Community Health Centres (CHCs) per lakh population and access to improved and non-shared toilet facility are crucial indicators that determine the food security status in the rural parts of the districts.

Overall, the policy focus should be on expanding availability of food through better irrigation facilities in this otherwise rainfed region which suffers from high rainfall variability year-on-year, increasing access to food through provision of employment opportunities in non-farm sector which in turn will better the economic dependency ratio, increase the casual wages and eventually augment the consumption expenditure. Expanding jobs under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) is one such way of providing employment opportunities in rural areas apart from expanding investment in allied sectors i.e., fishing, livestock rearing, food processing and processing of non-timber forest products (NTFPs). Such an investment will also lead

to employment in service sectors such as storage and transport.

The focus should also be on improving the utilisation or absorption of food through enhancing the provision of basic health infrastructure, safe drinking water, and access to improved toilet facilities which will reduce the prevalence of diseases like diarrhoea. Improvement of female literacy rates is crucial for the entire region which will go a long way in enriching the households' nutritional intakes owing to better exposure and knowledge about healthy diet, sanitation and hygiene practices, and health behaviour. It can also improve the purchasing power of the household and in turn enhance their consumption expenditure. Literacy and adult literacy programmes with emphasis on female literacies should be undertaken in priority districts to begin with.

Public Distribution System (PDS) has played an important role in reducing hunger in Jharkhand. A strengthened and expanded PDS can contribute to further addressing larger issue of food insecurity and malnutrition as well. Distribution of millets through the PDS can further enhance the nutritional outcomes of the households. Millets, being a drought-resistant crop, is most suited for cultivation in these rainfed regions with limited irrigation facilities. Jharkhand Government has launched the Millets Mission on priority basis. For the most food insecure areas, there should be procurement of millets for distribution through the PDS. There is also increasing demands for millets in the urban areas, the packaging and processing of which gives additional employment and income opportunities in the food insecure areas of the state.

The identification of priority districts and highlighting the policy variables, which are crucial in such food insecure districts and require urgent attention, can go a long way in providing a detailed roadmap for appropriate government interventions in the food insecure districts to improve their condition of food security.



## INTRODUCTION

**F**ood and nutrition security (FNS) is critical for any society, and is a top priority in national and global developmental agendas. To achieve the Sustainable Development Goal (SDG) of eliminating all kinds of malnutrition, ensuring access to nutritious food is a must. The SDG target 2.1 to end hunger and food insecurity has a cause-and-effect relationship with other SDGs i.e., SDG 1 (no poverty), SDG 3 (good health and wellbeing), SDG 6 (clean water and sanitation), SDG 12 (responsible consumption and production), and SDG 13 (climate action). Food security is jeopardised when there are insufficient supplies of nutritious and safe foods, or when consumers' purchasing power is constrained (Bazerghi et al. 2016). The notion of '*sustainable food security*' can be understood through, availability of food or adequate food production; access to food or ability to purchase food; quality along with the nutritional value of food (includes micronutrients as well as safety); and stability in provision of food (Helland and Sörbö 2014).

India ranked 94 among 107 nations in the Global Hunger Index (GHI), 2020 and was in the '*serious*' hunger category along with other three neighbouring countries — Bangladesh, Myanmar, and Pakistan. In GHI 2021, India ranked 101 among 116 countries.<sup>1</sup> The State of Food Security and Nutrition in the World (SOFI) report, 2020 shows that 27.8 per cent of India's population suffered from moderate or severe food insecurity in 2014-2016, and the percentage rose

to 31.6 per cent in 2017-2019. The number of food-insecure people grew from 42.65 crore in 2014-2016 to 48.86 crore in 2017-2019. India accounted for 22 per cent of the global burden of food insecurity. These figures indicate the challenge that the country faces in achieving the SDG target of ending hunger by 2030.

Despite a higher economic growth rate, there is a constant failure in translating the growth into reduction of poverty and malnutrition. The nutritional status of a population is an outcome of the complex and inter-related set of factors, which can neither be addressed by a single sector/intervention alone nor without greater commitments, leadership, direction towards convergent and accountable action approach at each level and layers in a life cycle, and continuum of continued and cumulative care approach.

A study conducted by the MS Swaminathan Research Foundation (MSSRF 2008) which classified various Indian states based on a composite index of food insecurity and composite of seven hunger indicators, found that the eastern states such as Chhattisgarh and Jharkhand fell under the category of 'very high' food insecurity, while Bihar and Odisha were classified under 'high' food insecurity. Sharma and Gulati (2012) classified the various Indian states based on two indices of malnutrition, namely, the Normalized Adult Malnutrition Index (NAMI), and

1. <https://www.globalhungerindex.org/pdf/en/2021.pdf> accessed on 10 August 2022.



the Normalized Child Malnutrition Index (NCMI), and found that all the eastern states fell in the top two categories of malnutrition.

The Institute for Human Development (IHD) and the United Nations World Food Programme (WFP) together undertaken an analysis of the dimensions of food security at the sub-state, or district level, for eight states of India – Odisha, Jharkhand, Chhattisgarh, Madhya Pradesh, Rajasthan, Bihar, Uttar Pradesh, and Maharashtra. The *Food Security Atlas of Rural Jharkhand* was part of this series of eight atlases produced by the IHD and WFP during 2008. The purpose of this exercise was to: (a) identify the regions and social groups most affected by food insecurity, and (b) suggest policy interventions appropriate for improving food security for those regions and social groups. This food security atlas concluded that the districts of Jharkhand fared poorly on nutritional outcomes, with only the more urbanised and industrialised districts doing better. Access to roads and irrigation were two areas in which the state lagged considerably behind the country, while low per capita agricultural productivity was the feature of the state’s rainfed agriculture. The study highlighted eight districts as requiring urgent attention for food security interventions in Jharkhand. It also recommended that rural connectivity and small-scale irrigation (e.g., check dams) and watershed management in a manner appropriate to hill and plateau regions, should form the core of efforts to reduce extreme poverty, and thus hunger, in Jharkhand.

### 1.1 Definition of Food Security

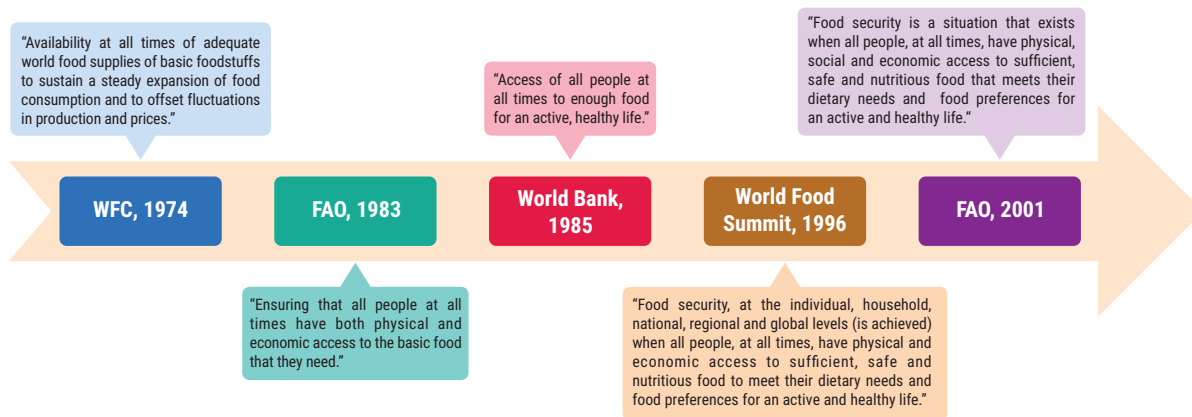
Food security is a multifaceted and dynamic concept. According to Hoddinott (1999) defining food security has progressed significantly over time, with more than 200 definitions and 450 indicators being identified. The concept was developed in the mid-1970s, during a period of global food crisis (1972-1974). The first world food conference was held in Rome in 1974, which focused on the problem of global production, commerce, and stocks due to widespread malnutrition. The conference recommended the adoption of an international undertaking on World Food Security (WFS) at the World Food Conference (WFC), and asked governments to examine the global problem of food production and consumption, and solemnly proclaimed that “every man, woman and child have the inalienable right to be free from hunger and malnutrition to develop their physical and mental faculties” (OHCHR 1974).

#### Box 1.1: Defining Food Security

Food security is a product of four different and inter-related aspects, namely: food availability denoting availability of ‘sufficient quantities of food of appropriate quality’; food access involving households’ access to ‘adequate resources for acquiring appropriate foods for a nutritious diet’; utilisation indicating utilisation or absorption of food through diet and supporting factors or ‘non-food inputs in food security’ such as clean water, sanitation and health care ‘to reach a state of nutritional well-being where all physiological needs are met’; and finally, stability, emphasising that ‘to be food secure, a population, household or individual must have access to adequate food at all times’ given risks such as sudden, unforeseen shocks.

Source: FAO-ESA (2006).

Figure 1.1: Evolving Definition of ‘Food Security’





As per FAO (1996, part 1) “Food security, at the individual, household, national, regional and global level is achieved 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.” This definition of food security stipulates that sufficient quantity as well as the quality of food should be culturally acceptable and should be available at all times throughout the year.

Food and nutrition security can be defined as a situation that exists when all people at all times have physical, social and economic access to food, which is consumed in sufficient quantity and quality to meet their dietary needs, requirements for growth, and food preferences, and is supported by an environment of adequate sanitation, health services, and caregiving.

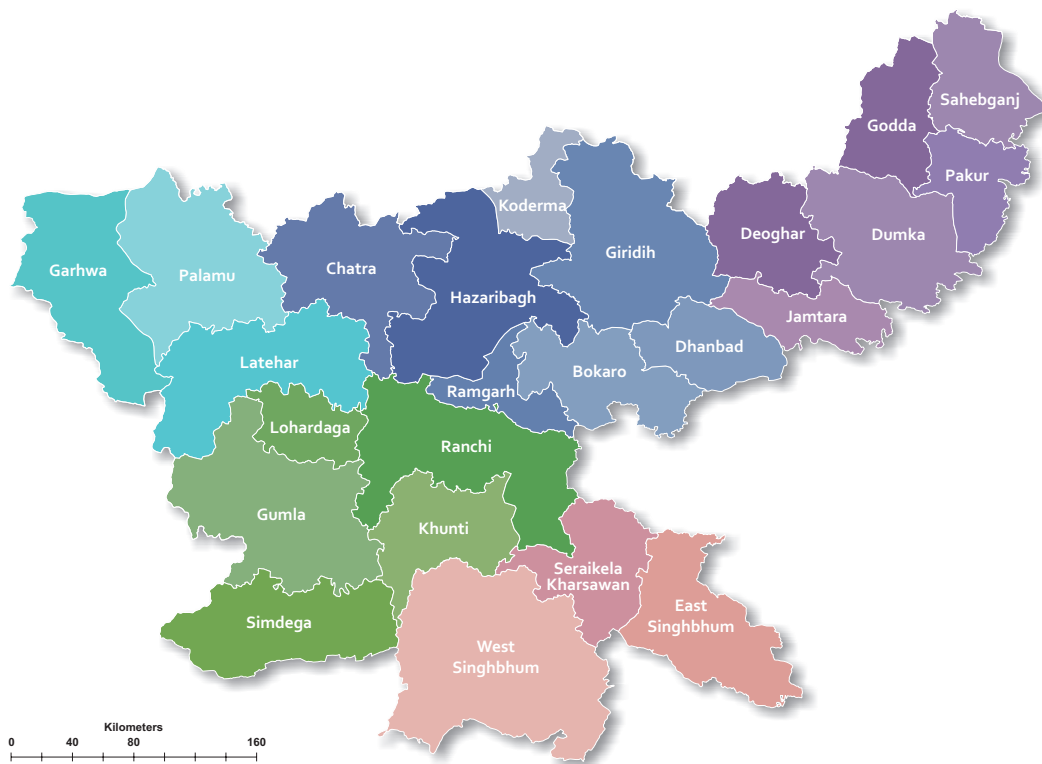
## 1.2 Jharkhand: An Overview

Jharkhand was carved out of the state of Bihar in 2000, and has since made remarkable progress across a range

of development indicators. The state of Jharkhand, with a population of over 3 crores has been at the forefront of growth stories among the Indian states in the recent past. Despite surging growth, poverty in the state is among the highest in the country. Food security and deprivation are of serious concern, particularly in the interior areas of the state. According to the recently released report on multidimensional poverty by NITI Aayog, Jharkhand with 42.16 per cent has the second-highest multidimensional poverty among the Indian states.

According to the “SDG India Index Baseline Report” of 2018 (Government of India 2018) as well as 2019 (Government of India 2019), Jharkhand ranks last among the aspirant states in terms of Goal 1 (end poverty), Goal 2 (end hunger), and Goal 3 (health and wellbeing). The state ranks second among performer-states on Goal 4 (ensuring quality education), and last among the performer states in terms of Goal 6 (access to quality of water and sanitation). According to SDG India Index 2020-21, Jharkhand ranks second-worst

**Map 1.1: Administrative Divisions (Districts) of Jharkhand**



Source: Administrative Atlas, Census of India 2011.

in terms of overall SDGs while worst in zero hunger parameter.

### 1.2.1 Socio-Demographic Characteristics

Jharkhand as the 14<sup>th</sup> most populous state in India is home to 330 lakh people. More than 75 per cent of people in this state live in rural areas. The overall literacy rate is around 66 per cent with female literacy rates (55.4 per cent) and rural literacy rates (61.0 per cent) being much lower as compared to their counterparts.

According to Census 2011, the share of the ST population in Jharkhand is 26 per cent. It is home to 32 tribal communities and 8 Particularly Vulnerable Tribal Groups (PVTGs). Out of 24 districts of Jharkhand, 12 districts are Scheduled Areas.<sup>2</sup> Additionally, two Blocks in Godda District, one in Garhwa District and two Panchayats of Palamu District are also Scheduled Areas.

### 1.2.2 Economy

While the economy of Jharkhand is mostly driven by the tertiary sector, agriculture and allied activities constitute the mainstay of the rural population of Jharkhand. In Jharkhand, agriculture and the allied sector contributes around 13 per cent to the Gross State Value Added (GSVA) whereas about 43 per cent

of total workforce is dependent on this sector. During the financial year 2019-20, the share of agriculture in the GSVA is estimated to be 12.6 per cent, that of the 'secondary sector' and services is estimated to be 32.8 per cent and 45.8 per cent, respectively. Between 2011-12 and 2019-20, the share of the tertiary sector in the GSVA has increased while that of the other sectors have declined.

The sectoral distribution of workers as indicated by Periodic Labour Force Survey (PLFS) 2020-21 shows that about 64 per cent of the workers are engaged in the agriculture, forestry and fishing sector followed by 17 per cent in the construction sector in rural Jharkhand. This clearly shows the high dependence on the agricultural sector. Also, the labour force participation rate in rural areas among the 15-59 age group in 2020-21 is 69 per cent and for male and female it is respectively 84 per cent and 55 per cent. The employment status (principal and subsidiary status) shows about three-fourth are self-employed, 18 per cent are casual labour and only 7 per cent are regular salaried in rural Jharkhand.

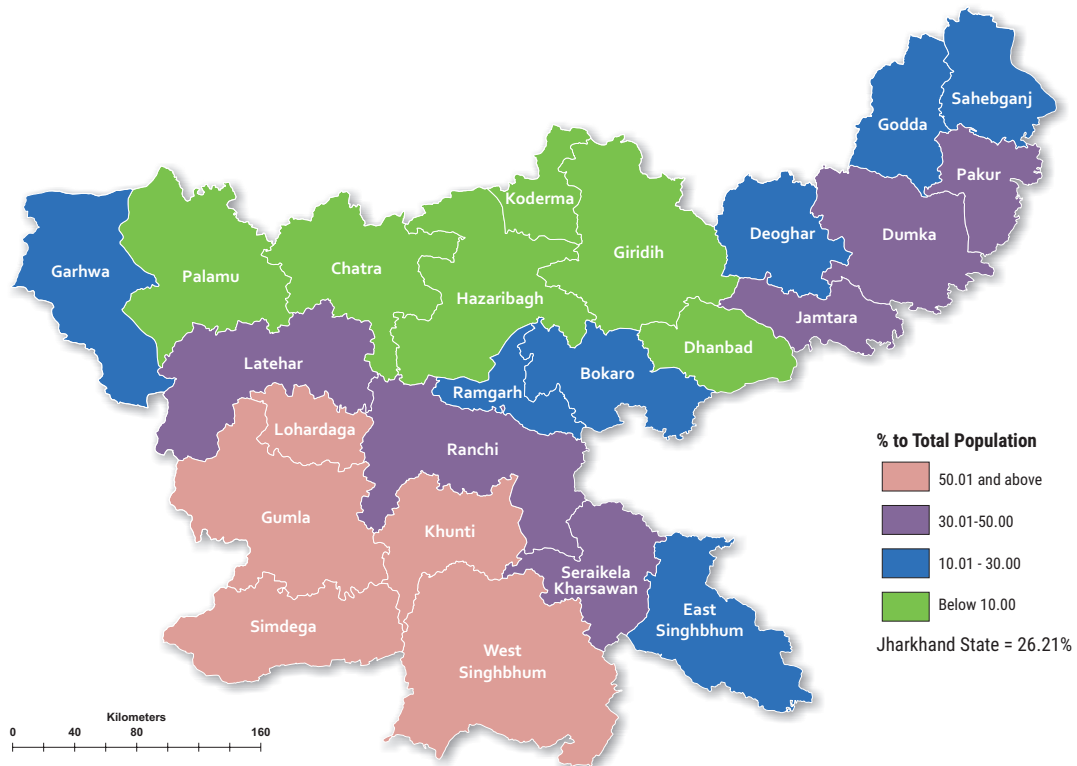
The shifts in the sectoral shares are due to comparatively slower growth in the 'agriculture, forestry and fishing', secondary and 'mining and quarrying' sectors, and fairly higher growth in the service sector. While the 'agriculture, forestry and

**Table 1.1: Socio-Demographic Characteristics of Jharkhand and India, 2011**

Parameters	Jharkhand	India
Total population	3.3 crore	121.1 crore
Population growth rate (2001-2011)	22.4%	17.7%
Level of urbanisation	24.1%	31.2%
Rural population	75.9%	68.8%
Scheduled Tribe population	26.2%	8.6%
Literacy rate (7+ years)	66.4%	74.0%
Male literacy rate (7+ years)	76.8%	82.1%
Female literacy rate (7+ years)	55.4%	65.5%

Source: Census of India, 2011.

2. The following are the Scheduled Areas in Jharkhand: Ranchi District, Lohardaga District, Gumla District, Simdega District, Latehar District, Purbi Singhbhum District, Pashchimi Singhbhum District, Saraikela-Kharsawan District, Sahibganj District, Dumka District, Pakur District, Jamtara District, Palamu District – Rabda and Bakoria Panchayats of Satbarwa Block, Garhwa District – Bhandaria Block, Godda District – Sunderpahari and Boarjor Blocks.

**Map 1.2: District-wise Percentage of Scheduled Tribe Population in Jharkhand, 2011**

Source: Administrative Atlas, Census of India 2011

fishing' sector has been estimated to have grown at the rate of 2.5 per cent (2019-20 projected on year-on-year) and the secondary sector by 4.9 per cent, the growth rate of the service sector is estimated to be 7.9 per cent.

In Jharkhand, agriculture is mainly rainfed. The gross irrigated area is only about 15 per cent of the gross cropped area which is why, agriculture in the state is mostly mono-cropped. The cropping intensity is only 126 per cent. The net sown area of this state constitutes 33.9 per cent of its geographical area. Kharif is the dominating crop of the state occupying about 78 per cent of its gross cropped area. The decline in the share of the agricultural sector is because of its technological and economic limitations as well as on account of the less than the optimal performance of this sector. There is ample scope for improvement in

the performance of this sector through the expansion of the area under cultivation, increase in the area under irrigation and augmentation in the adoption of improved and appropriate technology.<sup>3</sup>

### 1.2.3 Multidimensional Poverty Index

The Multidimensional Poverty Index (MPI) is a measure of poverty that looks beyond income to understand how people experience poverty across other dimensions, in multiple and simultaneous ways. The MPI uses 10 indicators to measure poverty across three dimensions: education, health, and living standards including indicators for nutrition, child mortality, years of schooling, school attendance, sanitation, cooking fuel, drinking water, electricity, housing, and assets, which are used to capture the poverty in the three dimensions.

3. Jharkhand Economic Survey, 2020-21.

**Table 1.2: Sectoral Growth Rate and Sectoral Contribution to Growth Rate and their Share in GSVA at Constant Prices in Jharkhand, 2019-20**

Sectors and sub-sectors	Sectoral growth rate (2019-20 Pr. on Y-o-Y)	Contribution to growth rate	Share in GSVA
1. Agriculture, Forestry and Fishing	2.5	5.7	12.6
1.1 Crop	-0.2	-0.3	6.3
1.2 Livestock	3.8	2.1	3.1
1.3 Forestry and Logging	5.3	2.4	2.6
1.4 Fishing	12.4	1.4	0.7
2. Mining and Quarrying	1.8	2.9	8.9
I. Primary	2.2	8.6	21.5
3. Manufacturing	5.8	22.9	22.5
II. Secondary	4.9	28.9	32.8
III. Tertiary	7.9	62.5	45.8
GSVA	5.6	100	100
GSDP	6.7	-	-

Note: GSVA: Gross State Value Added; GSDP: Gross State Domestic Product; Y-o-Y: year-on-year.

Source: Jharkhand Economic Survey, 2020-21.

Those who are deprived of at least one-third of the MPI's components are defined as multidimensionally poor. Jharkhand reports one of the largest progresses among all Indian states in reducing multidimensional poverty. The MPI for rural Jharkhand decreased from 0.246 in 2015-16 to 0.183 in 2019-2021. However, the MPI for the state is still higher than that for rural part of Chhattisgarh at 0.12, Odisha at 0.11, and the national average at 0.10 (Table 1.3).

The district-wise distribution shows that the districts such as Ramgarh (0.161), Koderma (0.169), Hazaribagh (0.175), Dhanbad (0.176), Ranchi (0.183), Bokaro (0.190), and Purbi Singhbhum

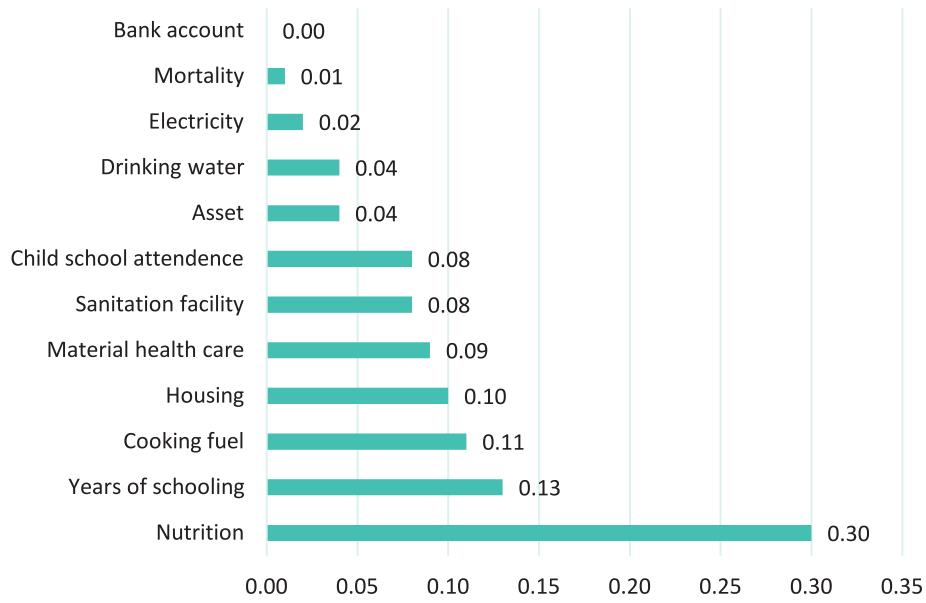
(0.198) had the lowest MPI in rural areas during 2015-16, while the less developed districts such as Pashchimi Singhbhum (0.347), Pakur (0.321), Chatra (0.320), Sahibganj (0.317) have the highest MPI figures. This is also evident from their levels of multidimensional head count ratio (HCR) and intensity of poverty. As per NFHS-5, more than 50 per cent of the rural population is multidimensionally poor in Sahibganj (59 per cent), Pashchimi Singhbhum (62 per cent) and Pakur (58 per cent), whereas less than 30 per cent of the rural population is multidimensionally poor in Ranchi (26 per cent) during 2019-2021.

**Table 1.3: Multidimensional Poverty Index, Multidimensional Head Count Ratio, and Intensity of Poverty in Rural Areas, 2015-16 and 2019-2021**

States	Multidimensional Poverty Index (MPI)		Multidimensional Head Count Ratio (H) (%)		The intensity of poverty (A) (%)	
	2015-16	2019-2021	2015-16	2019-2021	2015-16	2019-2021
Jharkhand	0.246	0.183	50.93	42.2	48.27	43.36
Odisha	0.152	0.11	32.66	24.49	46.45	44.92
Chhattisgarh	0.163	0.12	35.73	23.74	44.83	50.55
India	0.155	0.10	32.75	24.50	47.38	41.63

Source: National Family Health Survey (NFHS)-4, 2015-16 and NFHS-5, 2019-2021, NITI Aayog methodology.

**Figure 1.2: Contribution of the Indicators to the Multidimensional Poverty Index**

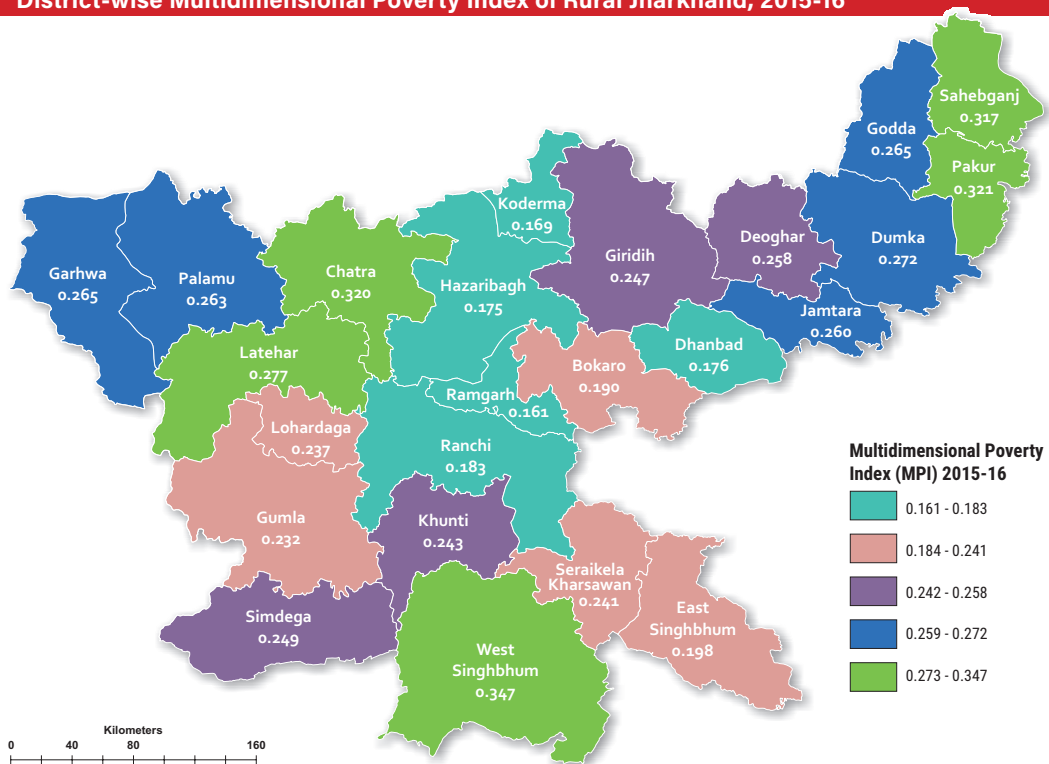


Source: Computed by IHD Research Team from NFHS-5, 2019-2021.

Figure 1.2 presents the contribution of different components of MPI in rural Jharkhand. Among the 12 indicators, the deprivation related to nutrition contributes

the highest (30 per cent) to the MPI. The other indicators, in descending order of their contribution to MPI, are years of schooling, cooking fuel, housing, maternal

**Map 1.3: District-wise Multidimensional Poverty Index of Rural Jharkhand, 2015-16**



Source: Computed by IHD Research Team from NFHS-4, 2015-16.

health, child school attendance, sanitation, drinking water, assets, electricity, and child mortality.

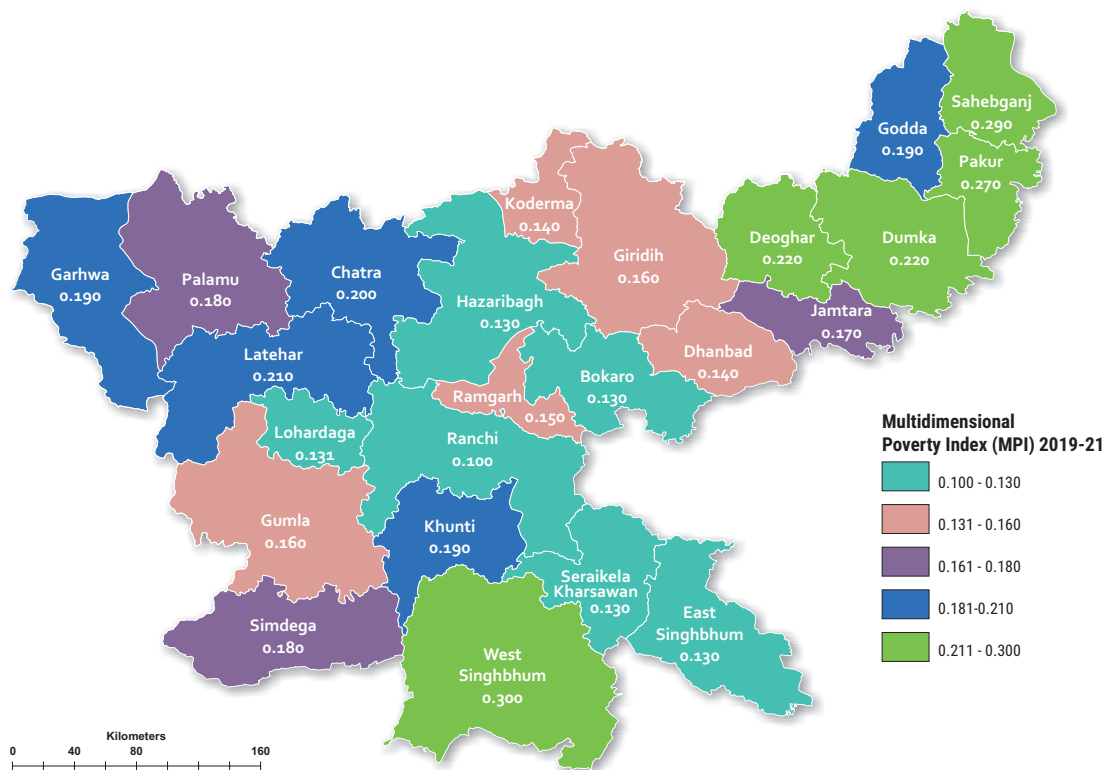
The district-wise distribution shows that the industrialised districts such as Ranchi (0.100), Bokaro (0.130), Purbi Singhbhum (0.130) and Saraikela-Kharsawan (0.130) have the lowest MPI during 2019-2021, while the less developed districts such as Paschimi Singhbhum (0.300), Sahibganj (0.290), Pakur (0.270), Dumka (0.220) and Deoghar (0.220) have the highest MPI figures. This is also evident from their levels of multidimensional HCR and intensity of poverty.

As per the HCR from NFHS-5, more than 50 per cent of the rural population is multidimensionally poor in Pashchimi Singhbhum (62 per cent), Sahibganj (59.5 per cent), and Pakur (57.8 per cent), whereas districts that stand at the lowest HCR of MPI are Ranchi (25.6 per cent), Saraikela Kharsawan (31.1 per cent), Lohardaga (32.2), and Hazaribagh (32.7 per cent) during 2019-2021.

The comparative analysis (Table 1.4) in HCR of multidimensional poverty between 2015-16 and 2019-2021 indicate that the decrease in HCR is highest in the districts of Saraikela-Kharsawan (21.1 percentage points), Chatra (19.7 percentage points), Lohardaga (18.2 percentage points), and Ranchi (16.1 percentage points). On the other hand, the difference in HCR between 2015-16 and 2019-2021 is lowest in the districts of Sahibganj (0.2 percentage points), Ramgarh (0.4 percentage points), Pashchimi Singhbhum (2.2 percentage points), and Koderma (2.7 percentage points).

Maps 1.3 and 1.4 show the district-level MPI score in Jharkhand for two time periods of 2015-16 and 2019-2021. These clearly indicate that the districts of Ranchi, Bokaro, Hazaribagh, Lohardaga, and Purbi Singhbhum have the lowest MPI in 2019-2021 (ranging from 0.100 to 0.130), whereas the districts with lowest MPI were Ramgarh, Kadarma, Hazaribagh, Dhanbad and Ranchi (ranging between 0.161 to 0.183) in 2015-

**Map 1.4: District-wise Multidimensional Poverty Index of Rural Jharkhand, 2019-2021**



Source: Computed by IHD Research Team from NFHS-5, 2019-2021.

**Table 1.4: District-wise Multidimensional Poverty of Rural Jharkhand, 2015-16 and 2019-2021**

District	2015-16			2019-2021		
	HCR	Intensity	MPI	HCR	Intensity	MPI
Bokaro	43.5	43.7	0.190	33.2	39.1	0.130
Chatra	63.1	50.8	0.320	43.4	46.1	0.200
Deoghar	55.0	47.0	0.258	48.6	45.3	0.220
Dhanbad	40.5	43.6	0.176	33.3	42.1	0.140
Dumka	56.2	48.4	0.272	50.2	43.9	0.220
Garhwa	54.4	48.7	0.265	44.2	43.0	0.190
Giridih	51.2	48.2	0.247	36.9	43.4	0.160
Godda	54.2	49.0	0.265	43.3	43.9	0.190
Gumla	49.0	47.3	0.232	38.4	41.7	0.160
Hazaribagh	39.8	43.9	0.175	32.7	39.7	0.130
Jamtara	54.6	47.7	0.260	41.1	41.3	0.170
Khunti	51.0	47.6	0.243	44.1	43.1	0.190
Kodarma	37.1	45.5	0.169	34.4	40.7	0.140
Latehar	54.7	50.6	0.277	49.3	42.6	0.210
Lohardaga	50.3	47.2	0.237	32.1	40.5	0.130
Pakur	61.7	52.1	0.321	57.8	46.7	0.270
Palamu	51.3	51.3	0.263	43.0	41.9	0.180
Pashchimi Singhbhum	64.1	54.2	0.347	62.0	48.4	0.300
Purbi Singhbhum	42.9	46.3	0.198	32.2	40.4	0.130
Ramgarh	37.1	43.2	0.161	36.7	40.8	0.150
Ranchi	41.7	44.0	0.183	25.6	39.1	0.100
Sahibganj	59.6	53.1	0.317	59.5	48.8	0.290
Saraikela-Kharsawan	52.2	46.2	0.241	31.1	41.8	0.130
Simdega	52.4	47.5	0.249	41.7	43.1	0.180
Total	50.9	48.3	0.246	42.2	43.3	0.183

Source: Computed by IHD Research Team from NFHS-4, 2015-16 and NFHS-5, 2019-2021.

2016. The five districts with highest MPI in 2019-2021 are Pashchimi Singhbhum, Sahibganj, Pakur, Dumka, and Deoghar (ranging between 0.220 to 0.300), whereas in 2015-16 the districts with highest MPI were Pashchimi Singhbhum, Pakur, Chatra, Sahibganj, and Latehar (ranging between 0.277 to 0.347).

#### 1.2.4 Health, Nutrition and Sanitation

The state of Jharkhand continues to suffer from high incidences of malnutrition amongst children and anaemia in adults. Malnutrition is also far more prevalent in Jharkhand than in the neighbouring states

of Odisha and Chhattisgarh. Pregnant women and new-borns in Jharkhand, particularly those living in the rural areas, continue to remain at risk due to low uptake of institutional delivery, as well as their poorer infant and neonatal mortality rates as compared to the corresponding national averages. The rate of neonatal mortality continues to remain high in Jharkhand at nearly 28 per cent, while it is 30 per cent for rural areas. The under-five mortality rate (U5MR) is as high as 45 per cent in Jharkhand and 49 per cent in its rural areas as per the NFHS-5.



**Table 1.5: Mortality and Nutritional Status of Children and Women (%), Jharkhand and Selected States, 2019-2021**

State/India	Under-five Mortality Rate (U5MR)	Infant Mortality Rate (IMR)	Children under 5 years who are			Children aged 6-59 months who are anaemic	Women (15-49 years) who are anaemic	Women whose body mass index (BMI) is below normal
			Underweight	Wasted	Stunted			
Jharkhand	45.4	37.9	39.4	22.4	39.6	67.5	65.3	26.2
Uttar Pradesh	59.8	50.4	32.1	17.3	39.7	66.4	50.4	19.0
Madhya Pradesh	49.2	41.3	33.0	19.0	35.7	72.7	54.7	23.0
Odisha	41.1	36.3	29.7	18.1	31.0	64.2	64.3	20.8
Chhattisgarh	50.4	44.3	31.3	18.9	34.6	67.2	60.8	23.1
Rajasthan	37.6	30.3	27.6	16.8	31.8	71.5	54.4	19.6
Assam	39.1	31.9	32.8	21.7	35.3	68.4	65.9	17.6
Bihar	56.4	46.8	41.0	22.9	42.9	69.4	63.5	25.6
India	41.9	35.2	32.1	19.3	35.5	67.1	57.0	18.7

Source: NFHS-5, 2019-2021.

Children in Jharkhand are at substantially higher risk of chronic and current malnutrition. Child under/malnutrition is caused by inadequacies in food, health and care for infants and young children, especially in the first two years of life. Nearly 40 per cent of children under the age of five in Jharkhand suffered from chronic malnutrition (stunting), approximately

39 per cent were underweight, and 22 per cent suffered from wasting as of 2019-2021 (NFHS-5). These numbers are significantly higher than national averages. More than 50 per cent of the children belonging to the ST and scheduled caste (SC) households were underweight and stunted in 2015-16.

**Table 1.6: Early Childhood Mortality Rates (%) in Jharkhand and India, 2015-16 and 2019-2021**

Region/Year			Neonatal Mortality Rate (NNMR)	Infant Mortality Rate (IMR)	Under-five Mortality Rate (U5MR)
Jharkhand	2015-16	Urban	..	34.0	38.0
		Rural	..	46.0	58.0
		Total	..	44.0	54.0
	2019-2021	Urban	17.7	22.2	27.3
		Rural	30.4	41.1	49.2
		Total	28.2	37.9	45.4
All-India	2015-16	Urban	..	29.0	34.0
		Rural	..	46.0	56.0
		Total	..	41.0	50.0
	2019-2021	Urban	18.0	26.6	31.5
		Rural	27.5	38.4	45.7
		Total	24.9	35.2	41.9

Source: NFHS-4 (2015-16) and NFHS-5 (2019-2021).



**Table 1.7: Nutritional Status of Children Under Five Years in Jharkhand and India, 2015-16 and 2019-2021**

Region/Year			Stunted (Height-for-age) (%)	Wasted (Weight-for-height) (%)	Underweight (Weight-for-age) (%)
Jharkhand	2015-16	Urban	33.7	26.8	39.0
		Rural	48.0	29.5	49.8
		Total	45.3	29.0	47.8
	2019-2021	Urban	26.8	23.0	30.0
		Rural	42.3	22.3	41.4
		Total	39.6	22.4	39.4
All-India	2015-16	Urban	31.0	20.0	29.0
		Rural	41.2	21.5	38.3
		Total	38.0	21.0	35.8
	2019-2021	Urban	30.1	18.5	27.3
		Rural	37.3	19.5	33.8
		Total	35.5	19.3	32.1

Source: NFHS-4 (2015-16) and NFHS-5 (2019-2021).

Anaemia among children and women is another serious issue in Jharkhand. The prevalence of anaemia among children aged 6-59 months was high at 69 per cent in 2015-16 (NFHS-4) which reduced slightly to 67.5 per cent during 2019-2021 (NFHS-5). The intake of inadequate nutrition during pregnancy leading to deficiencies such as anaemia is not only detrimental to both the mother's health and foetal development of her child, but also puts her pregnancy at greater risk.

Research shows that iron and folic acid supplements reduce the risk of anaemia and iron deficiency in pregnant women. However, anaemia is widely prevalent among women in Jharkhand, with 65.3 per cent of the women in the reproductive age group of 15-49 years found to be anaemic as of 2019-2021. The incidence of anaemia is, however, slightly lower (56.8 per cent) among pregnant women in the age group of 15-49 years.<sup>4</sup> Further, the incidence of anaemia is

**Table 1.8: Incidence of Anaemia among Women (15-49 years) in Jharkhand and India, 2015-16 and 2019-2021**

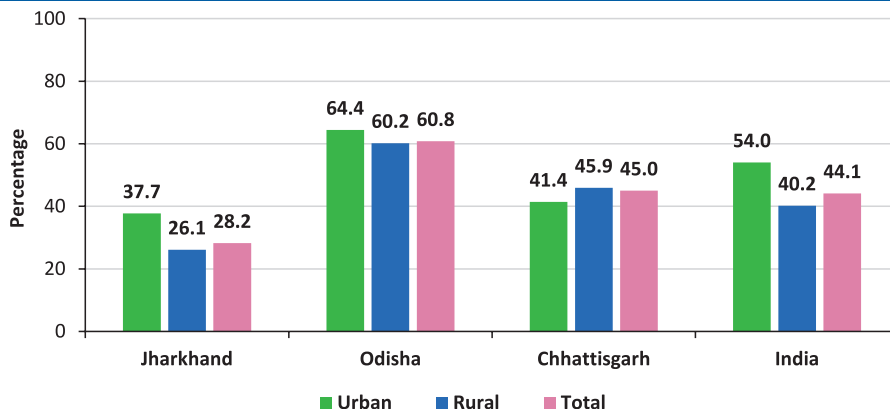
Region/Year			All women aged 15-49 years who are anaemic (%)	Non-pregnant women aged 15-49 years who are anaemic (<12.0 g/dl) (%)	Pregnant women aged 15-49 years who are anaemic (<11.0 g/dl) (%)
Jharkhand	2015-16	Urban	59.6	59.7	57.3
		Rural	67.3	67.5	63.7
		Total	65.2	65.3	62.6
	2019-2021	Urban	61.1	61.6	45.5
		Rural	66.7	67.0	59.2
		Total	65.3	65.7	56.8
All-India	2015-16	Urban	50.8	51.0	45.8
		Rural	54.3	54.4	52.2
		Total	53.1	53.2	50.4
	2019-2021	Urban	53.8	54.1	45.7
		Rural	58.5	58.7	54.3
		Total	57.0	57.2	52.2

Note: Haemoglobin in grams per decilitre (g/dl).

Source: NFHS-4 (2015-16) and NFHS-5 (2019-2021).

4. The benchmark haemoglobin level is slightly lower for pregnant women as compared to that for non-pregnant women.

**Figure 1.3: Iron and Folic Acid Supplements Intake by Mothers for 100 Days or More during Pregnancy in Jharkhand and Selected States, 2019-2021**



Source: NFHS-5, 2019-2021.

slightly lower in the urban areas as compared to the rural areas, but it is still very high and continues to be a matter of concern for mother and child health.

As of 2019-2021, only 28.2 per cent of the pregnant women consume iron and folic acid supplements for at least 100 days in Jharkhand. While this is an improvement as compared to the status in 2015-16 (15.3 per cent), Odisha and Chhattisgarh, have much higher corresponding figures of 60.8 per cent and 45.0 per cent, respectively. The figures are lower for rural areas i.e., 26.1 per cent as of 2019-2021.

About 13.4 per cent of all the households lacked access to improved drinking water sources in Jharkhand as of 2019-2021. However, there has been

a substantial improvement in access since 2015-16 when the access of households to improved drinking water sources averaged at 78.0 per cent. Access to sanitation facilities in the state is much poorer as compared with access to drinking water. As many as 43.0 per cent of the households do not use an improved sanitation facility. As of 2015-16, only 25.0 per cent of the households in the state had access to improved sanitation facilities which bettered to 56.7 per cent in 2019-2021.

The performance of Jharkhand in many nutrition-related indicators is not satisfactory. From the above discussion, it is obvious that Jharkhand faces a huge challenge for achieving higher FNS.

**Table 1.9: Status of Water, Sanitation and Hygiene (WASH) Parameters in Jharkhand and India, 2019-2021**

Region/WASH parameters		Population living in households with improved drinking-water source <sup>1</sup> (%)	Population living in households that use improved sanitation facility <sup>2</sup> (%)	Households using clean fuel for cooking <sup>3</sup> (%)
Jharkhand	Urban	94.6	75.9	71
	Rural	84.1	50.8	19.5
	Total	86.6	56.7	31.9
All-India	Urban	98.7	81.5	89.7
	Rural	94.6	64.9	43.2
	Total	95.9	70.2	58.6

- Note:
1. Piped water into dwelling/yard/plot, piped to the neighbour, public tap/standpipe, tube-well or borehole, protected dug well, protected spring, rainwater, tanker truck, cart with small tank, bottled water, community RO plant.
  2. Flush to a piped sewer system, flush to a septic tank, flush to pit latrine, flush to don't know where, ventilated improved pit (VIP)/biogas latrine, pit latrine with slab, twin pit/composting toilet, which is not shared with any other household. This indicator does not denote access to a toilet facility.
  3. Electricity, liquefied petroleum gas (LPG)/natural gas, biogas.

Source: NFHS-5, 2019-2021.

### 1.3 Government Programmes related to Food Security

Some relevant central as well as state government programmes related to food security which are operational in Jharkhand have been discussed in this section. These programmes play a potential role in influencing FNS outcomes among rural households.

#### 1.3.1 Central Government Programmes

##### Public Distribution System

The Public Distribution System (PDS) under the National Food Security Act (NFSA) 2013 is one of the important programmes which partly safeguard the basic food need of the poor. Established by the Government of India under the Ministry of Consumer Affairs, Food, and Public Distribution and managed jointly by state governments, it distributes subsidised food (prices of ₹ 1, ₹ 2 and ₹ 3 for coarse-grains, wheat and rice respectively) to the poor. Major commodities distributed include staple food grains, such as wheat, rice, sugar, and kerosene, through a network of fair price shops (FPS) established in several states. The basic objective of the programme is provision of food grains and other essential items to the vulnerable section of the population at a subsidised price. According to NFSA 2013 in Jharkhand under targeted PDS (TPDS), every priority household or priority household (PHH) cardholder family has the legal right to get 5 kg of grains per person per month at the rate of ₹ 1 per kg. Similarly, every family covered under Antodaya Anna Yojana (AAY) has the legal right to get 35 kg of food grains per month. While the availability of staples – mostly rice and wheat through PDS not only helps households to overcome the persistent risks of food shortages but it also helps the household to reduce their budgetary outlays on staples and afford a more varied diverse diet.

##### Supplementary Nutrition under Integrated Child Development Services

Supplementary nutrition is one of the six services provided under the Integrated Child Development Services (ICDS) scheme which is primarily designed to bridge the gap between the recommended dietary allowance (RDA) and the average daily intake (ADI).

The provision of supplementary nutrition, given to the children (6 months–6 years) and pregnant and lactating mothers under the ICDS scheme, prescribed for various categories of beneficiaries is as follows:

- Children in the age group of 6 months to 3 years: Food supplement of 500 calories of energy and 12-15 grams of protein per child per day as take-home ration (THR) in the form of micronutrient fortified food and/or energy-dense food marked as 'ICDS food supplement'.
- Children in the age group of 3-6 years: Food supplement of 500 calories of energy and 12-15 grams of protein per child per day. Since a child of this age group is not capable of consuming a meal of 500 calories in one sitting, the guidelines prescribed provision of morning snacks in the form of milk/banana/seasonal fruits/micronutrient fortified food etc. and a hot cooked meal (HCM).
- Severely underweight children: Food supplement of 800 calories of energy and 20-25 grams of protein per child per day in the form of micronutrient fortified and/or energy-dense food as THR.
- Pregnant women and lactating mothers: Food supplement of 600 calories of energy and 18-20 grams of protein per day in the form of micronutrient fortified food and/or energy-dense food as THR.

##### PM POSHAN Scheme

The Government has approved the Centrally Sponsored Scheme Pradhan Mantri Poshan Shakti Nirman (PM POSHAN) for providing one hot cooked meal in Government and Government-aided schools from 2021-22 to 2025-26. Earlier known as National Programme for Mid-Day Meal in Schools popularly known as Mid-Day Meal Scheme, PM POSHAN is being implemented by the Ministry of Education. Under the Scheme, there is provision of hot cooked meal to children of pre-schools or *Bal Vatika* (before class I) in primary schools also in addition to school children studying in Classes I-VIII. The main objectives of the scheme are to address the persistent

problems of hunger and education for children in India by improving the nutritional status of eligible children. The goals of POSHAN Abhiyaan are to achieve improvement in nutritional status of children from 0-6 years, adolescent girls, pregnant women and lactating mothers, in a time bound manner. It aims to reduce malnutrition in the country in a phased manner, through a life cycle approach. Special provision is made for providing supplementary nutrition items to children in aspirational districts and districts with high prevalence of anaemia.<sup>5</sup>

Mission Poshan 2.0, an integrated nutrition support programme has been announced in budget 2021-22 for all States/Union Territories (UTs). It seeks to strengthen nutritional content, delivery, outreach and outcomes with focus on developing practices that nurture health, wellness and immunity to disease and malnutrition. A programme to support development of *Poshan Vaitikas* at Anganwadi Centres to meet dietary diversity gap leveraging traditional knowledge in nutritional practices has also been taken up.<sup>6</sup>

### 1.3.2 State Government Programmes

#### Mukhyamantri Dal-Bhat Yojana

To provide affordable and accessible food to the poor working class near their workplace and to provide one-time complete hygienic and nutritious meal to below poverty line (BPL) families, *Mukhyamantri Dal-Bhat Yojana* was introduced. This scheme is implemented through the state Department of Food, Public Distribution and Consumer Protection and covers all the districts of Jharkhand. It offers one meal which includes cooked *dal* (pulses), *bhat* (rice) and one *sabji* (vegetable) to eligible people at the rate of ₹ 5 in busy public places within the state such as bus-stands, hospitals, etc. In Jharkhand, 377 *Dal-Bhat* centres are currently operational and 12 *Dal-Bhat* centres are operational during the night.<sup>7</sup> The financial allocation has increased from ₹ 1,870.6 lakh in 2015-2016 to ₹ 2,097.06 lakh in 2017-18, and expenditure

has increased from ₹ 1,108.9 lakh to ₹ 1,522.3 lakh during the same period.

#### Distribution of Free Flow Iodised Salt to AAY/PHH Family

Under the State Food Security Act, the scheme Distribution of Free Flow Iodised Salt to AAY/PHH Family identifies the PHH with iodine deficiency and distributes iodised salt to such households at subsidised rates. The Government of Jharkhand through the state Department of Food, Public Distribution and Consumer Protection provides free flow iodised salt to PHH and AAY households at the rate of ₹ 1 per kg per month across all districts in the state. The number of targeted beneficiaries under this scheme has increased from 51.7 lakh in 2015-16 to 58.4 lakh in 2017-18. The financial allocation has increased from ₹ 930.8 lakh to ₹ 3,688.6 lakh, and expenditure has increased from ₹ 866.7 lakh to ₹ 3,533.6 lakh during the same period.

#### Dakia Yojana for Primitive Tribal Groups

The state Government of Jharkhand (Food and Civil Supplies Department) has launched a free rice scheme for Primitive Tribal Groups (PTGs) called as PTG *Dakia Yojana*. In Jharkhand state, there are eight PTGs and they are: Asur, Birhor, Birajia, Korwa, Parahiya (Baiga), Sabar, Mal Pahariya, and Souriya Pahariya. Under this scheme, state government provides 35 kg package of rice per month to the PTG households in Jharkhand. The food grains are provided door-to-door by Food Public Distribution and Consumer Affairs Department. The scheme was initially started in three districts including, Godda, Sahibganj and Palamu, and more than 70,000 PTG families were estimated to get benefits under this scheme.

There are a number of schemes directly/indirectly affecting the nutritional status of children (0-6 years age) and pregnant women and lactating mothers. In spite of these, level of malnutrition and related

5. <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1812421> accessed on 10th August, 2022.

6. <https://pib.gov.in/Pressreleaseshare.aspx?PRID=1812421> accessed on 10th August, 2022.

7. Jharkhand Economic Survey (2018-19), CFS, Government of Jharkhand, pp.121 ([https://finance-jharkhand.gov.in/pdf/JES\\_2018\\_19\\_ebook.pdf](https://finance-jharkhand.gov.in/pdf/JES_2018_19_ebook.pdf))

problems is high. There is no dearth of schemes, but lack of creating synergy and linking the schemes with each other to achieve common goal. National Nutrition

Mission (NNM) has been launched by Government of India in 2017-18 to create the synergy through robust convergence mechanism and other components<sup>8</sup>.

Additionally, Jharkhand Nutrition Mission (JNM) has been launched by the Department of Women and Child Development and Social Security, Government of Jharkhand in 2015. JNM provides technical leadership to assist the multi-sectoral plans for nutrition-specific and sensitive interventions.

#### 1.4 Scope of the Study and Objectives

Taking different economic development outcomes or input indicators, we can rank the districts or clusters based on the composite index. If the objective of the exercise was merely to decide on the districts in which to concentrate food security interventions, then such a ranking would have been sufficient. But this would say nothing about the types of interventions that should be undertaken specifically in the region to improve food security, which is one of the key objectives of the study. Why such a relation holds is something that is a matter of analysis. Whether it is due to enhanced women's agency contributing to better utilisation of household income, or through literate women having a better knowledge of improved nutritional practices, or some other relation — it is for analysis to bring out these relations. But the indicators can draw attention to the issues wherein significant differences exist.

The specific objectives of this study are:

- To explore the dimensions, indicators, approach and methods of measuring food security in terms of food availability, access, and utilisation.
- To analyse the nature and dynamics of the food security situation at the district level and identify the regions/districts which are most affected by food insecurity in rural Jharkhand.

- To suggest policy interventions appropriate to improving food security for the food insecure regions in Jharkhand.

#### 1.5 Methodology: Measurement, Dimensions and Indicators

The study is primarily based on secondary information and data sources. Apposite literature surveys as well as past studies have been used to identify variables that are crucial to analyse various dimensions of FNS. The study has been limited to the district level of the state of Jharkhand. The district-level FNS variables relating to the three dimensions i.e., availability, access and utilisation, for the state of Jharkhand have been collected and compiled from secondary sources like Census of India 2011 (Village Directory, Primary Census Abstract), PLFS, National Sample Survey (NSS) (2018-19), Agricultural Census, NFHS (2015-16 and 2019-2021), data from Directorate of Economics and Statistics and, lastly, data gathered from the different government departments (both central and state). Also, data relating to different government programmes, e-MIS have been collected from government portals.

##### 1.5.1 Dimensions, Indicators and Data Sources

Many factors are responsible for the FNS of a particular region. The indicators sometimes make a clear distinction between food secure and food-insecure districts. But it is sometimes difficult to make a causal relationship between the indicator and food security outcome.

Food security is the ability of a household to command food (its food entitlements), generally acquired as an outcome of and net result of its livelihood activities (plus any other non-livelihood-based entitlements), that is crucial in determining the food security of the household. These livelihood activities, from the point of view of food security, are valued not only for the food they might directly produce, if at all they produce food, but also from the

5. [http://icds-wcd.nic.in/nnm/NNM-Web-Contents/UPPER-MENU/AboutNNM/PIB\\_release\\_NationalNutritionMission.pdf](http://icds-wcd.nic.in/nnm/NNM-Web-Contents/UPPER-MENU/AboutNNM/PIB_release_NationalNutritionMission.pdf)



standpoint of exerting a command over food that the livelihood activities give to the household. It is at this level of effective demand for food (both consumed out of self-production and purchased) that market failures take place, requiring the public intervention of different kinds. Food production, or agricultural production more broadly, then enters as a part, even the main part, of rural livelihood activities that provide command over food.

Within a household, it is known that there are gender differences in entitlements. Consequently, it is necessary to deal with not just factors influencing

household entitlements, but also those influencing individual entitlements within the household. Factors of gender differentiation and discrimination come into the picture in influencing the individual entitlements of women and men, girls and boys. Further, there could be a substantial imbalance between the use of energy and its replacement through food. Given that women generally work longer hours than men and women also get less nutrition than men, this imbalance could itself be a factor in nutritional shortfalls for women. Entitlements are not only based on an individual's or household's economic attainments but there are also

**Table 1.10: Indicators used to Compute Food and Nutrition Security Index**

Variables	Sources
<b>(A) Availability</b>	
(1) Rainfall Variability (100-CV of Annual (1989-2018) (%))	Indian Metrological Department, Government of India (GoI)
(2) Per Capita Value of Agricultural Output (Cereal) (20818-19, 2019-20 and 2020-21)	Department of Agriculture, Animal Husbandry and Co-operative, Government of Jharkhand (GoJ)
(3) Percentage of Net Irrigated Area to Net Sown Area; (2017-18)	Ministry of Agriculture, GoI
(4) Urbanisation Rate, 2011	Census of India, 2011
<b>(B) Access</b>	
(1) Percentage Other than Agricultural Labourer to All Labourers, 2011	Census of India, 2011
(2) Percentage Non-SC & ST Population, 2011	Census of India, 2011
(3) Non-Dependency Ratio, 2011	Census of India, 2011
(4) Average Per Capita Consumption Expenditure, 2018-19	PLFS, 2018-19
(5) Casual Wage, 2018-19	PLFS, 2018-19
(6) Percentage of Village having Access to Paved Road, 2011	Census of India, 2011
<b>(C) Utilisation</b>	
(1) Percentage Household having Access to Safe Drinking Water, 2019-2021	NFHS, 2019-2021
(2) Number of Primary Health Centre (PHC)/Community Health Centre (CHC) per lakh Population (Health and Family Welfare Statistics, 2019-20)	Ministry of Health and Family Welfare, GoI
(3) Female Literacy Rate, 2019-2021	NFHS, 2019-2021
(4) Disease and Health Behaviour (100-Prevalence of Diarrhoea (reported) in the Last 2 Weeks Preceding the Survey (%)), 2019-2021	NFHS, 2019-2021
(5) Percentage of Household having Access to Improved Toilet, 2019-2021	NFHS, 2019-2021
<b>(D) Outcome Indicator</b>	
1. Children under 5 years who are Underweight (Weight-for-Age) (%)	NFHS, 2019-2021
2. Women whose Body Mass Index (BMI) is Below Normal (BMI < 18.5 kg/m <sup>2</sup> ) (%)	NFHS, 2019-2021
3. Children age 6-59 months who are Anaemic (<11.0 g/dl) (%)	NFHS, 2019-2021

government – or community-based – entitlements. The operation of various schemes, such as the Mid-Day Meal Scheme in schools, do have some, even substantial, impact on the access of children, both girls and boys, to food. The performance of these schemes depends very substantially on-demand from below the hunger-fulfilment pyramid for provision of these services, and also on the involvement of women in local governance. But the entitlements that come through special interventions have been separated in our analysis from those that provide the ‘normal’ entitlements to food. Of course, we also try to see whether there is a connection, as there ought to be, between the food security status of a district and the public interventions in that district. FNS index is being calculated by taking into consideration 15 variables under the three main dimensions of food security i.e., availability index, access index, and utilisation index (Table 1.10).

Data sources used for computing the FNS index and its analysis are given below:

**National Family Health Survey (NFHS):** The NFHS-4 (2015-16) and NFHS-5 (2019-2021), provides information on morbidity, health and nutrition of women and children. The latest survey has captured district-level estimates for many important indicators that helps to understand the cluster-wise concentration of information.

**National Sample Survey (NSS) Consumption Expenditure Rounds:** The NSS consumption expenditure round basically gives the quantity and value of food consumption expenditure. The NSS survey is conducted every five years. Here in the analysis, we have used the latest round of relevant data i.e., 68<sup>th</sup> round (2011-12). In this report, we have used the monthly per capita consumption expenditure (MPCE) at the district level for computing the index. Here we have used the MPCE for 2018-19 PLFS data and adjusted it to the ratio of MPCE between the ratio of MPCE arrived from 68<sup>th</sup> Consumption Expenditure Round and the Employment-Unemployment Round, 2011-12.

**Periodic Labour Force Survey (PLFS):** It gives the estimates of employment and unemployment

indicators, work participation rates etc. The PLFS is released annually and here we have used the 2018-19 survey round to calculate the wage rate and MPCE.

**Census of India:** The Census of India conducts surveys every decade, and the survey is conducted by Registrar General and Census Commissioner, India. The analysis has used the data related to social category, dependency ratio and access to different infrastructures like paved roads and access to the nearest town. Here in the report, we have used the latest two rounds i.e., 2001 and 2011.

### 1.5.2 Methods

Most of the variables selected for the FNS index are developmental variables. To calculate FNS, we have converted/arranged all the variables in the same direction. The district with a higher FNS index value is considered as more food secure as compared to that with a lower index value. Broadly, we have adopted two broad methods — first the Range Equalization Method (REM) to calculate the dimensional indices as well as overall FNS index and Principal Component Analysis (PCA) to identify the variables for policy analysis. The REM method was adopted by United Nations Development Programme (UNDP) in calculating the human development index (HDR 2005). To get a more circumspective outlook, one of the objectives of the FNS is to show the district's position in various dimensions of FNS by not just comparing differentials from a base period between districts but to observe the FNS behaviour from many perspectives that applying all the above-mentioned methods will facilitate. The FNS is a composite index covering three dimensions, i.e., access, availability and utilisation of food. Another important dimension is stability which could not be used in calculating the final FNS index as district-level data was not available.

#### Range Equalization Method (Max-Min Approach)

Under the max-min approach, an index has been constructed for each variable that is calculated by applying the following general REM formula adopted by UNDP. In computing the food security index (FSI), we adopted the REM wherein each hunger fulfilment indicator – adjusted for its minimum value – is divided

by the range so that absolute, scale-free values are identified that vary between 0 and 1. The highest value in each index falls short of unity as the value for the top-ranking state/district which is yet to reach the goalpost, that is 1 as the best achievement indicator; while a value close to 0 is the lowest ranking state/district which is still to do the minimum required to rise from its lowest achievement status.

$$\text{Variable Index} = \frac{X_i - \text{Min}X}{\text{Max}X - \text{Min}X}$$

Where,

$X_i$ : Value of the variable

min  $X$ : Minimum value of  $X$  in the scaling

max  $X$ : Maximum value of  $X$  in the scaling

In undertaking the scaling procedure, the maximum and minimum values for each hunger fulfilment indicator are taken. Indicators included in FNS index have been scaled and normalised (to make them unidirectional) to take a value on a scale ranging from 0 to 1. The scaled least achievement corresponds to zero, whereas the best achievement corresponds to 1. After calculating the index of each variable, we have averaged them by dividing by the number of districts to get each dimension index i.e., availability index, access index and utilisation index. Finally, we have averaged these three dimensions to arrive at the composite FNS index. After calculating the FNS index, we have cross-checked the findings with the outcome index which is comprised of four import indicators analysed in the subsequent sections.

#### Principal Component Analysis Method

The PCA is one of the important techniques to analyse the status of food security. The following steps have been adopted in calculating the FNS index.

- Unidirectional variable: Here we have converted all the variables into positive direction.
- Use the mean standardisation technique for normalisation of the value of the variables ( $X_i/\text{mean of } X$ ). The normalised value made all the variables scale-free.

- Here all the 14 variables, which are being normalised, are used in the calculation of the FNS index.
- Finding out descriptive, extraction, rotation, eigen value and eigen vectors.
- Those principal components are chosen whose eigen value is greater than 1.
- The factor loading of the first component gives the important policy variables.

Analysing conditions at the district level necessarily reflects the local context and captures important cultural and political dimensions, and risks, thereby simplifying complex issues. Having said that, reducing major food security themes to their core elements, allows a bottom-up approach to understand the risks to FNS. Here in this analysis, we have covered all the 24 districts of Jharkhand.

#### 1.5.3 Data Analysis Tools

The analysis of quantitative information has been done by using statistical software such as Statistical Package for the Social Sciences (SPSS) and STATA. Apart from these, GIS package — Arc GIS — has also been used in identifying the clusters of food-insecure regions/districts in terms of different indices of food security. The quantitative analysis includes simple ratios, percentages, graphs and higher statistical analysis such as inequality exercise and preparation of indices.

#### 1.6 Structure of the Report

This report is an effort to provide a district-level profile of FNS in Jharkhand. It consists of seven chapters, and the section below outlines how each of these chapters is strung together.

The **first introductory chapter** presents a background of FNS and its definition, overview of existing FNS related situation in Jharkhand and major research questions to base the present study. This chapter also provides the dimensions and indicators, approaches and methods of measurement used in computing the FNS index. It gives an overview



of the study region i.e., the state of Jharkhand, its socio-demographic characteristics, economy, status of poverty and inequality, health, nutrition and sanitation etc. and a brief outline of the government programmes relevant to food security which are operational in Jharkhand.

**Chapter two, three and four** highlights the status of food security in Jharkhand at the regional and district level. They include the construction of different dimensions of FNS and the status of districts in the FNS profile. Chapters two, three and four undertake detailed analysis of the three dimensions of food security i.e., availability dimension, access dimension and utilisation dimension respectively. These three chapters have identified broad clusters which are prone to extreme food insecurity and the factors behind the poor performance of these districts in the State.

**Chapter five** explains the status of overall food security through cluster identification and the probable reasons for the backwardness within the particular regions/districts. In this chapter, Food Security Outcome (FSO) Index has been computed based on the outcome indicators. Districts have also been ranked based on this index.

**Chapter six** identifies the priority districts and makes a comparative significance of food security policy variables as well as draw comparisons between the FSI and FSO.

**Chapter seven**, which is the last concluding chapter, presents the summary of important findings of the study, and provides some policy recommendations to improve the food security situation in rural Jharkhand.



## AVAILABILITY OF FOOD

**F**ood security has three dimensions — availability, access, and absorption or utilisation.<sup>1</sup> The availability and access dimensions are about getting food to the body whereas absorption is about the uptake of energy and nutrition into the body (Lundqvist et al. 2015; WFP-IHD 2008). The food which translates from availability by access to food and its absorption are strongly linked to non-food factors such as water, sanitation, and hygiene (WASH). Lack of access to WASH can lead to infectious diseases like diarrhoea and other intestinal diseases that can significantly undermine a person's ability to absorb the necessary nutrients (Ahiadeke 2000). Studies also show that food insecurity is the result of lack of education, health and other basic capabilities (Conceição et al. 2016). WASH, education and health place food security as a part of the broader conceptual framework of wellbeing and development.

The outcome of food security can be taken to be the nutritional enrichment status of the individual, with the understanding that food intake is the basic, though not the only factor that affects nutritional status. As can be seen in developing and underdeveloped countries, the population, specifically the children, are deficient in basic nutrition because of low dietary intake, including less food diversification. Even inadequate distribution of food within the same household is also an important reason for malnutrition among children.

Food production, or agricultural production more broadly, then enters as a part, even the main part, of rural livelihood activities that provide command over food. Studies show that micronutrient intake and the underweight percentage and mortality bears a significant negative correlation (WFP-IHD 2008). This indicates an increase in micronutrient intake which can reduce the underweight and mortality among children.

Several indicators influence food insecurity in one way or the other. We have combined these indicators into a set of three broad food security indices:

1. Availability (production factors).
2. Access to food (household and individual level),
3. Utilisation/ability to absorb food.

### 2.1 Agricultural Characteristics

Post-independent India shows a remarkable achievement in terms of self-sufficiency in food grains. During the first two decades after independence, the economy remained a food deficient nation, but after that, it managed to achieve sufficiency in foodgrain production at the national level. India has now registered as a consistent net food exporting nation (MOSPI-WFP 2019). Food grain production in the country registered a steady increase over two decades from only 2090.0 lakh tonnes in 2005-06 to 3086.5 lakh tonnes in 2020-21.

1. There are four dimensions of food and nutrition security index i.e., availability, access, utilisation, and stability. However, the stability dimension has not been discussed in the food security index due to unavailability of data at disaggregated level.

Though Jharkhand is primarily an agrarian state, the agricultural economy in the state is at a very low level of development. The net sown area of the state constitutes 33.9 per cent of its geographical area. Soil structure of Jharkhand is poor with low fertility. Almost 90.0 per cent of the soils are acidic in nature and deficient in nutrients (Anonymous 2009). Also, the soil has poor water retention capacity.<sup>2</sup>

In Jharkhand, agriculture is mainly rainfed. The gross irrigated area is only about 15 per cent of the gross cropped area which is why, agriculture in the state is mostly mono-cropped. The cropping intensity is only 126 per cent. Kharif is the dominating crop of the state occupying about 78 per cent of its gross cropped area.

Around 9 per cent of the workers are cultivators but as per the Agricultural Census 2015-16, 85 per cent of total cultivators are small and marginal farmers comprising 15 per cent and 70 per cent, respectively. The small farmers hold only 43 per cent of total area. The average size of holding in the state has reduced from 1.58 hectares in 1991 to 1.17 hectare in 2015-16 (GOI 2020).

Compared to the national average, agricultural development in Jharkhand shows a poor performance. Low productivity, lesser use of high yielding variety seeds, cash crops, low and inequal distribution of irrigation potential are clearly visible despite somewhat impressive growth of agriculture over last three decades.

### 2.1.1 Production

In terms of percentage share in national food grain production, Jharkhand contributed only 1.8 per cent in 2019-20 and it increased only by 0.6 percentage point as compared to 2011-12 figure. On the other hand, states like Punjab, Uttar Pradesh and Madhya Pradesh combinedly contributed more than 40 per cent of total food grain production in 2019-20. The value of instability in food grain production in Jharkhand is 42.1 (standard deviation of growth rates of total food grain production 2006-2020).

Paddy production in Jharkhand is almost 70 per cent of total food grain production of the state showing an increase from 3326 thousand tonnes to 3976 thousand tonnes from the year 2007-08 to 2020-21. Moreover, the production of other crops like maize increased from 358 thousand tonnes to 593 thousand tonnes during the above-mentioned period. On the other hand, the pulses production increased from 295 thousand tonnes to 405 thousand tonnes.

### 2.1.2 Productivity

The average yield of food grains (1805 kg/ha) is very low in Jharkhand, around 483 kg per hectare less than the all-India average and less than half of those of high performing states like Punjab and Haryana. Jharkhand is at the 16<sup>th</sup> rank in terms of per hectare food grain production among 20 major states in India.

Table 2.1 shows the yield of major crops in India and Jharkhand over the period 2006-07 to 2019-20. This clearly shows that the yield of food grains in Jharkhand increased from 1550 kg in 2007 to 1891 kg in 2020 whereas the all-India figure shows an increase from 1756 kg to 2325 kg per hectare. The yield in Jharkhand was 88 per cent of the all-India figure in 2007 which reduced to 81 per cent in 2020. The yield of rice in Jharkhand was 1825 kg per hectare in 2007 which increased to 2350 kg per hectare in 2020. The yield of pulses in Jharkhand was comparatively higher (1034 kg per hectare) than that of the all-India figure (817 kg per hectare).

### 2.1.3 Extent of Irrigation

The extent of irrigation is found to be very low – less than 20 per cent which is more than 37 percentage points below the national average. Even this small figure is concentrated in a few pockets of the state. This has resulted in a low cropping intensity in the state. The state is by and large single-cropped. Again, though the state has an average rainfall (more than 140 cm), which is above the national average (110 cm), the

2. Status Paper on Rice in Jharkhand, Birsa Agricultural University. Downloaded from [http://forest.jharkhand.gov.in/fresearch/admin/file/research\\_665.pdf](http://forest.jharkhand.gov.in/fresearch/admin/file/research_665.pdf)

**Table 2.1: Yield of Cereal and Food Grains in Jharkhand and All-India (in kg per hectare), 2006-07 to 2019-20**

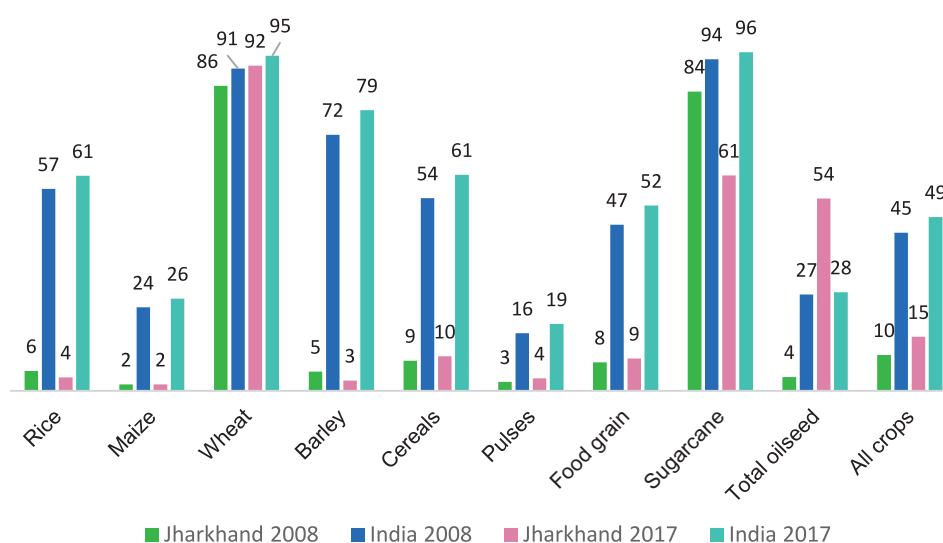
Crops	State/UT	2006-07	2011-12	2016-17	2019-20*
Food grains	Jharkhand	1550	1798	1856	1891
	All-India	1756	2078	2129	2325
	% Jharkhand	88.3	86.5	87.2	81.3
Rice	Jharkhand	1828	2131	2241	2350
	All-India	2131	2393	2494	2705
	% Jharkhand	85.8	89.1	89.9	86.9
Wheat	Jharkhand	1529	1908	2011	2071
	All-India	2708	3177	3200	3421
	% Jharkhand	56.5	60.1	62.8	60.5
Maize	Jharkhand	1230	1492	1923	2012
	All-India	1912	2478	2689	2945
	% Jharkhand	64.3	60.2	71.5	68.3

Note: \*-Provisional.

Source: Agricultural Statistics at a Glance, 2020, Directorate of Economics and Statistics, Government of India.

rainfall is quite erratic and unevenly distributed leading to crop failures, which in the absence of adequate state intervention, results in frequent famine or famine-like situations. This, along with low irrigation coverage, has resulted in a highly unstable growth of food grain production in the state over the last two decades.

As compared to 2011-12, the irrigation extent in Jharkhand increased from 12 per cent to 18 per cent in 2018-19 showing a 6-percentage point increase. In terms of the percentage of irrigated area, Jharkhand ranked second-lowest after Assam. Compared to all-India's irrigation extent of 54 per cent, Jharkhand

**Figure 2.1: Percentage Coverage of Irrigated Area under Principal Crops, 2008 and 2016-17 (P)**

Note: P-Provisional.

Source: Ministry of Agriculture, Government of India.

shows only 18 per cent (Table 2.3). The district-level irrigation pattern and inequality of irrigation are explained in details in the subsequent sections.

As regards crop-wise irrigated area (Figure 2.1), wheat and sugarcane have the maximum irrigated area amongst all the crops. The percentage of area irrigated under rice, which is one of the major crops occupying 70 per cent of total cropped area, has very low area under irrigation. Over the period, the area irrigated under rice has decreased from 6 per cent to 4 per cent between 2007 to 2017. Again, irrigation extent of pulses in Jharkhand ranged between 3-4 per cent and over the period of one decade no major change in extent of irrigated area was found. Area irrigated under oilseed marked a major change over the period. The percentage of area irrigated increased from 4 per cent to 54 per cent. Area irrigated under cereal increased from 9 per cent to only 10 per cent over the period of one decade. Irrigated area under all crops in Jharkhand increased from 10 per cent to 15 per cent whereas at all-India level it increased from 45 per cent to 49 per cent. Crop wise percentage coverage of irrigated area in Jharkhand was very low as compared to all-India figure.

#### 2.1.4 Agricultural Growth

In comparison to the national average or major states, Jharkhand, however, experienced an impressive growth in agricultural gross state domestic product (GSDP) during the decade 2004-05 to 2011-12. During 2011-12 to 2019-20, it registered a negative growth. The other states which experienced negative growth during the second phase are Bihar, Kerala and Uttarakhand. On the other hand, the overall GSDP also registered a decreasing trend during the two periods. The growth rate of GSDP during 2004-05

to 2011-12 was 14 percentage which reduced to 6 per cent in 2019-20.

Along with low irrigation coverage, the state has high instability in food grain production. The instability which is found out by standard deviation of growth rate of total food grain production between 2006 to 2020 shows that Jharkhand has the most unstable food grain production among 20 major states. The standard deviation of Jharkhand is highest at 42 as compared to all-India figure of 5. The states like Punjab, Uttarakhand and West Bengal are found to be the least unstable states in terms of food grain production. As a result of low agricultural productivity, low agricultural extent and low cropping intensity, the state's agriculture makes a very small contribution to aggregate national production.

Food grain output in Jharkhand grew at a rate of 1.1 per cent over the period 2007-08 to 2019-20 as compared to 2.1 per cent at All-India level. During the same period, the growth rate of yield per hectare was only 0.47 per cent in Jharkhand which is much lower than All-India (2.1 per cent). The growth rate of area under food grain in Jharkhand shows a growth rate of 0.61 per cent as compared to 0.19 per cent at All-India level. Over the period the area and production in Jharkhand registered a negative growth whereas in terms of yield it shows an appreciable growth of 4.4 per cent. The growth rate of production of paddy is 1.4 per cent in Jharkhand as compared to 1.7 per cent at All-India level.

#### 2.1.5 Diversification of Production

Beside low productivity growth, there has been little diversification of crops in Jharkhand away from food grains towards possibly higher value, non-food grain

**Table 2.2: Annual Growth Rate of Area, Production and Yield of Principal Crops in Jharkhand 2007-08 to 2019-20**

Crops	Jharkhand			India		
	Area	Production	Yield	Area	Production	Yield
Paddy	-0.01	1.38	1.40	-0.05	1.74	1.78
Maize	1.30	3.95	2.05	1.38	3.54	2.13
Pulses	0.18	2.46	2.28	1.42	3.78	2.32
Oilseeds	-10.07	-6.11	4.40	0.14	0.92	0.78
Food grains	0.61	1.09	0.47	0.19	2.14	1.94

**Table 2.3: Cropping Intensity and Irrigation Extent, Jharkhand and India, 2011-12 to 2018-19**

		2011-12	2018-19
Cropping intensity	Jharkhand	114.4	142.4
	India	138.9	148.7
	Jharkhand as % to India	82.4	95.8
Irrigation extent	Jharkhand	12.2	18.0
	India	46.6	54.7
	Jharkhand as % to India	26.2	32.9

**Note:** Cropping Intensity = Gross Area Sown/Net Area Sown (expressed as percentage).  
Irrigation Extent = Net Area Irrigated/Net Area Sown (expressed as percentage).

**Source:** National Statistical Office, Ministry of Statistics and Programme Implementation, Government of India.

crops. Jharkhand has no noticeable production of commercial crops (except for vegetables). Cereals account for around 80 per cent of the total value of agricultural production in Jharkhand. Studies found that crop diversification has reduced in Jharkhand and has been mainly towards oil seeds. The major reason for low crop diversification among small and marginal farmers was lack of proper irrigation, lack of knowledge and information, and non-availability of timely credit (Haque 2010). Again, non-remunerative prices were the major reason for lack of diversification towards cash crop (Haque 2010). Rice is the most important crop in Jharkhand contributing around 71 per cent to total agricultural production, but the average yield is low due to poor irrigation and low use of fertilisers. Also, in Jharkhand

rice production is not commercial and is meant only for self-consumption.

In Jharkhand, return to cultivation was found to be very low as compared to other developed agricultural states like Punjab and Haryana. This is because of low monetary cost of cultivation and low cost of hired labour (WFP-IHD 2008).

### 2.1.6 Forest Cover

The state has a high coverage of forest — more than 30 per cent of its area whereas at all-India level the total forest coverage is 22 per cent. The area under forests varies greatly within the state. In the districts located in the north-west and north central part of the state, more than 40 per cent of the area is under

**Table 2.4: District-wise Share of Forest Area to Total Geographical Area, 2019 (%)**

District	Forest area (%)	District	Forest area (%)
Latehar	56.1	Gumla	26.9
Chatra	47.8	Ramgarh	24.5
Pashchimi Singhbhum	46.6	Ranchi	22.9
Kodarma	40.3	Saraikela-Kharsawan	21.6
Hazaribagh	38.1	Bokaro	19.9
Khunti	35.7	Godda	18.7
Garhwa	34.0	Giridih	18.1
Lohardaga	33.6	Pakur	15.9
Simdega	32.9	Dumka	15.4
Purbi Singhbhum	30.3	Dhanbad	10.5
Sahibganj	27.7	Deoghar	8.2
Palamu	27.3	Jamtara	5.6
Total	29.6		

**Source:** Computed by IHD Research team based on *State of Forest Report, 2019*, Forest Survey of India.



forests (see Table 2.4). District Latehar (56 per cent) has the highest percentage of total forest area to the total geographical area followed by the districts Chatra (48 per cent) and Pashchimi Singhbhum (47 per cent). On the other hand, the districts with low forest area to total geographical area are Dhanbad, Deoghar, and Jamtara.

Non-Timber Forest Products (NTFPs) have gained global attention due to their contribution to household's livelihood and food security, poverty reduction and biodiversity conservation (Ahenkan & Boon 2011; Opaluwa et al. 2011). Forests include a considerable wealth of edible NTFPs constituting an important source of food, nutrition and livelihood security among tribal people (Singh & Quli 2011). They are a form of common property resource as well. Availability of forest area can affect food security as access to forest products provides income and supports nutrition, depending on the type and magnitude of the produce. But there are both legal and geographical restrictions on developing production in forest areas. Thus, it can be assumed that forest area is negatively associated with food security, since it limits the extension of agricultural production.

## 2.2 Food Availability

Food production provides the base for food security as it is a key determinant of food availability. Where production is largely for subsistence and is the main source of a household's food entitlement, food grain production is of paramount significance for household food and nutritional security. Food grains are also the cheapest source of energy and proteins compared to other foods, and are indispensable for the food security of the lower income groups (Chand and Kumar 2006).

In the context of stagnant yields of food grain production, use of food crops for biofuel production, diversion of crop land to biofuel cultivation, falling carrying capacity of land, environmental and sustainability issues, and global warming directly affect agricultural production. All of this manifested in rising

international prices of food. Increasing availability of food is a matter of urgent global concern. Global climate change, in particular, could have a critical impact on agricultural production. Empirical evidence shows that an increase in temperature affects crop production both directly and indirectly. It has been estimated that cereal yields in tropical regions, such as India, are going to decline for even a marginal increase (1-2° C) in temperatures (IPCC 2007). A great deal of research is needed to understand this impact in different states of the country.

This section analyses food availability across a number of component dimensions. Broadly, the variables used in the availability dimension are rainfall variability, per capita value of cereal crop, extent of irrigation, and urbanisation rate. In each dimension, efforts have also been made to compare the state's status vis-à-vis other major states. This section also shows the position of each district with respect to the selected indicators and the composite index and map of availability.

Road density and urbanisation are two important factors which determine the smoothness of transportation of food from surplus to deficit areas, thus making food available in such areas. Urbanisation level as well as road density and its penetration to rural areas is extremely low in Jharkhand as compared to the all-India figure. As per National Survey on Road Density, which excludes national highways and rural roads, Jharkhand has 86.26 km of road per 1,000 sq. km against a national average of 182.4 km per 1000 sq. km.<sup>3</sup>

## 2.3 Dimensions and Indicators of Food Availability

The concern for food availability stems from production and related aspects that sustain a desired level of food production. Food grains are considered to be of paramount significance for household food and nutritional security, the reason being that cereals and pulses are staple foods and there are no perfect substitutes for them (Chand 2007). Food grains are

3. Hindustan Times, 26 February 2014.



also the cheapest source of energy compared to other foods and are indispensable for the food security of low-income classes (Chand and Kumar 2006).

In our analysis, the following indicators have been chosen to determine a broad picture of food availability:

1. Rainfall Variability (100-CV of Annual [1989-2018] (%)).
2. Per Capita Value of Agricultural Output (Cereal) (2018-19, 2019-20 and 2020-21).
3. Percentage of Net Irrigated Area to Net Sown Area (2017-18).
4. Urbanisation Rate, 2011.

### 2.3.1 Rainfall Variability

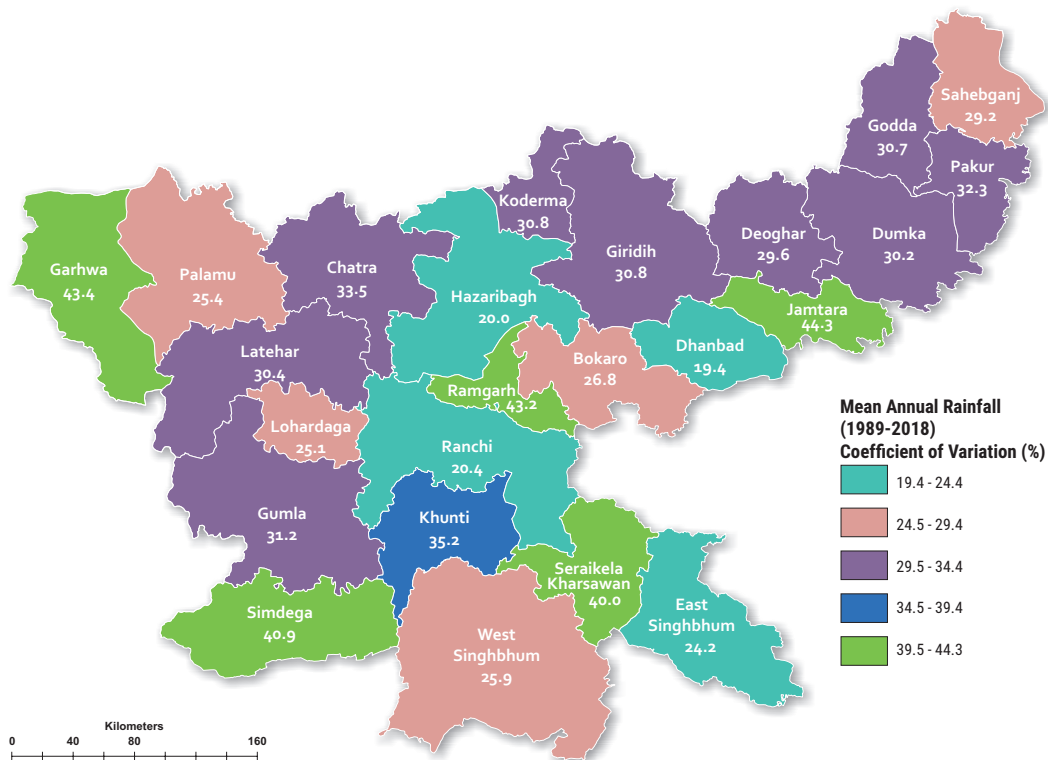
The impact of climatic variability on agriculture is a renewed interest among the researchers. Authors analysed the relation between the rainfall variability and food security. The climatic variability has a

negative impact on agriculture which in turn affects the food availability of the households. Study by Food and Agriculture Organization (FAO) shows that hunger is worse in countries which are sensitive to rainfall and temperature variability, and where a large percentage of people depend on agriculture (FAO 2018). Studies also show that climatic variability is a factor of childhood malnutrition (Ringler et al. 2010).

Rainfall variability is measured as the standard deviation of the growth rate of rainfall, which is frequently used in the economic literature. It is defined as the five-year rolling standard deviation of the growth rate of rainfall series. Rainfall variability leads to a high uncertainty of food production which in turn leads to fluctuation in agricultural production and household's income.

Map 2.1 depicts the district-wise rainfall variability which is the standard deviation of rainfall for last 3 decades. Higher the variability, lower will be the food security. The districts showing higher variability are

**Map 2.1: District-wise Rainfall Variability in Jharkhand, 1989-2018 (%)**



Source: Computed and prepared by IHD Research team based on data from Indian Metrological Department, Government of India.

Jamtara (44.3), Garhwa (43.4), and Ramgarh (43.2). On the other spectrum, districts showing lowest variability are Dhanbad (19.4), Hazaribagh (20.0), and Ranchi (20.4).

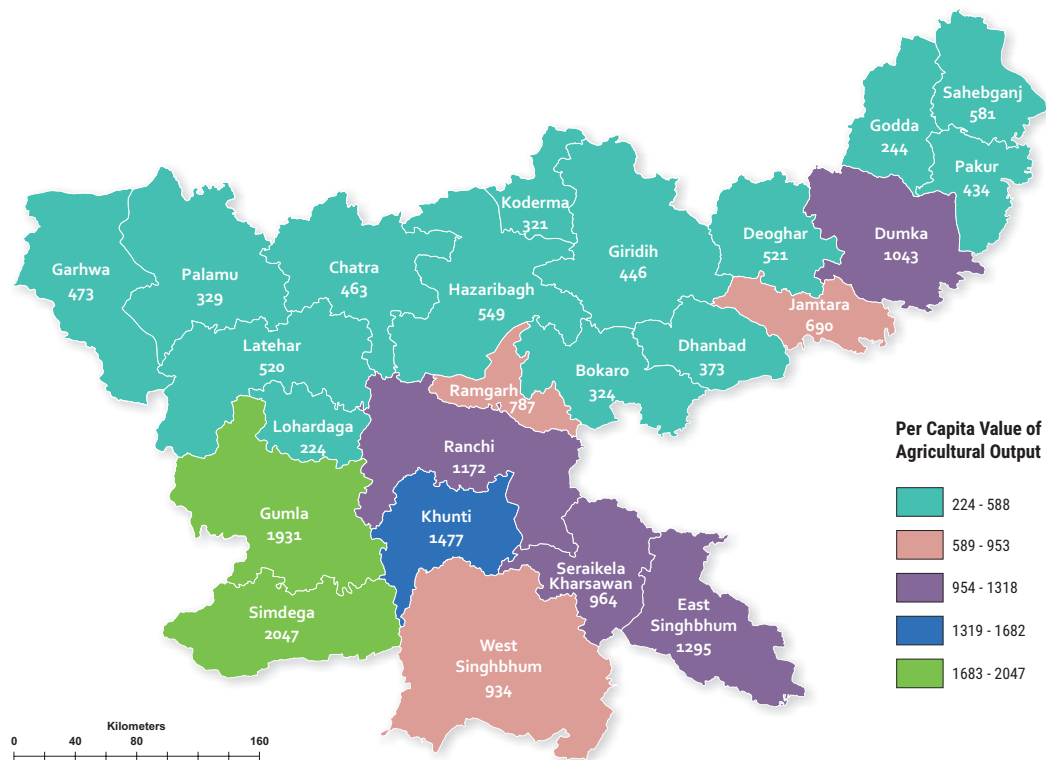
### 2.3.2 Per Capita Value of Agricultural Output (Cereal)

Agricultural output is an indicator reflecting availability of food. Since agriculture is dependent on climatic variability, it is therefore advisable to take an average of three to five years’ data of agricultural production to take into account the variability of production. For the availability index, we have taken the per capita value of cereal production at district level in Jharkhand. For representativeness, we have taken the average of three years’ production. The reason behind taking the value of cereal production is because cereal constitutes 87

per cent of total food grain production. To account for variations in population across districts, the per capita value of agricultural production has been used for three years i.e., 2018-19, 2019-20 and 2020-21. Prices of the cereals have been obtained from Bhalla and Singh (2010)<sup>4</sup>.

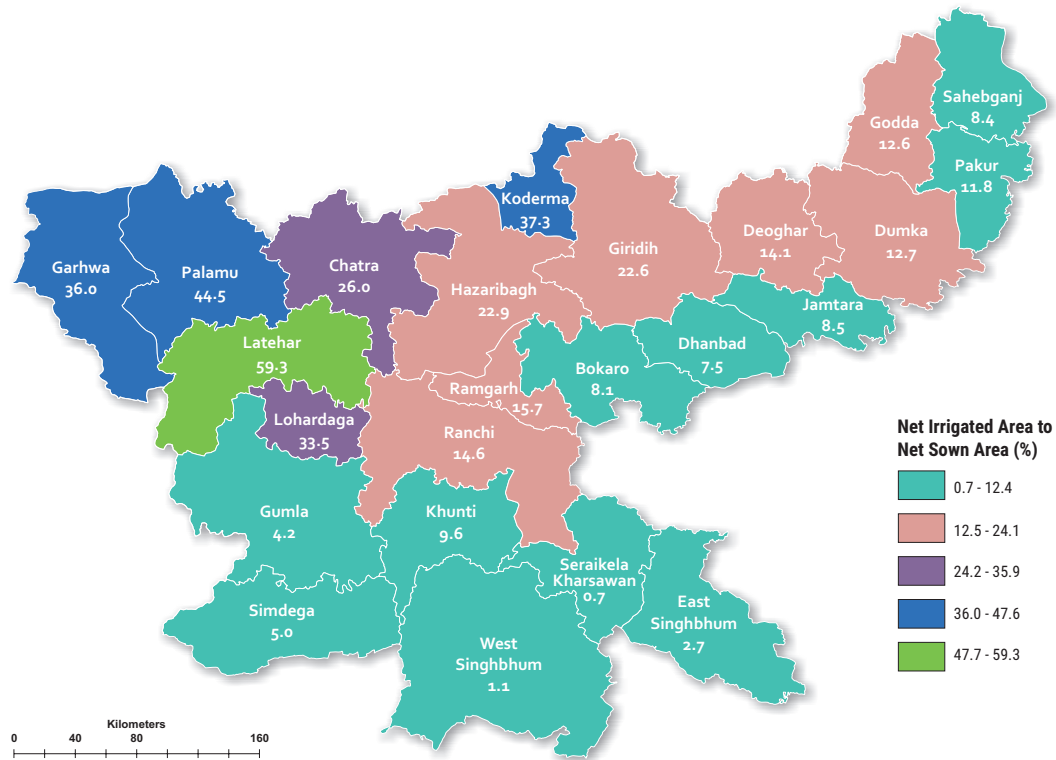
There is a wide inter-district variation in the per capita value of cereal production in Jharkhand. It varies from around ₹1931 in Gumla to around ₹224 in Lohardaga (see Map 2.2). The districts with less agricultural land (because of forest, wastelands, mines, industries or urban expansion) or low agricultural productivity have generally low per capita value of cereal output. Half of the total districts in Jharkhand have per capita value of cereal output lower than state figure.

**Map 2.2: District-wise Per Capita Value of Agricultural Output (Cereals) (in ₹) in Jharkhand, 2018-19 to 2020-21**



Source: Computed and prepared by IHD Research team from data compiled from Department of Agriculture, Animal Husbandry and Co-operative, Government of Jharkhand.

4. The price of the cereal pertains to triennium 1990-1993 average taken from Planning Commission Project conducted by Bhalla and Singh (2010).

**Map 2.3: District-wise Extent of Irrigation in Jharkhand, 2017-18**

Source: Computed and prepared by IHD Research team from data compiled from Ministry of Agriculture, Government of India.

### 2.3.3 Extent of Irrigation

Irrigation has a key role in both stabilising agricultural production through an increase in cropping intensity and an associated increase in productivity, improving a district's food security position. It would also provide a better prospect in terms of rural employment.

The extent of irrigation, represented by the percentage of the net area irrigated to the net area sown, is very low in Jharkhand – around 18 per cent. This is more than 37 percentage points below the national average. Irrigation has been grossly neglected in the state. In Jharkhand, irrigation is concentrated in small pockets of the state and there is also wide inter-district variation in irrigation coverage. It varies from less than 1 per cent in Purbi Singhbhum to around 59 per cent in Latehar (see Map 2.3). The central and north-eastern plateau zone are heavily dependent on monsoon and distribution of rainfall is uneven. The extent of irrigation in the north-west is much more than that in the central or south-west part of the state.

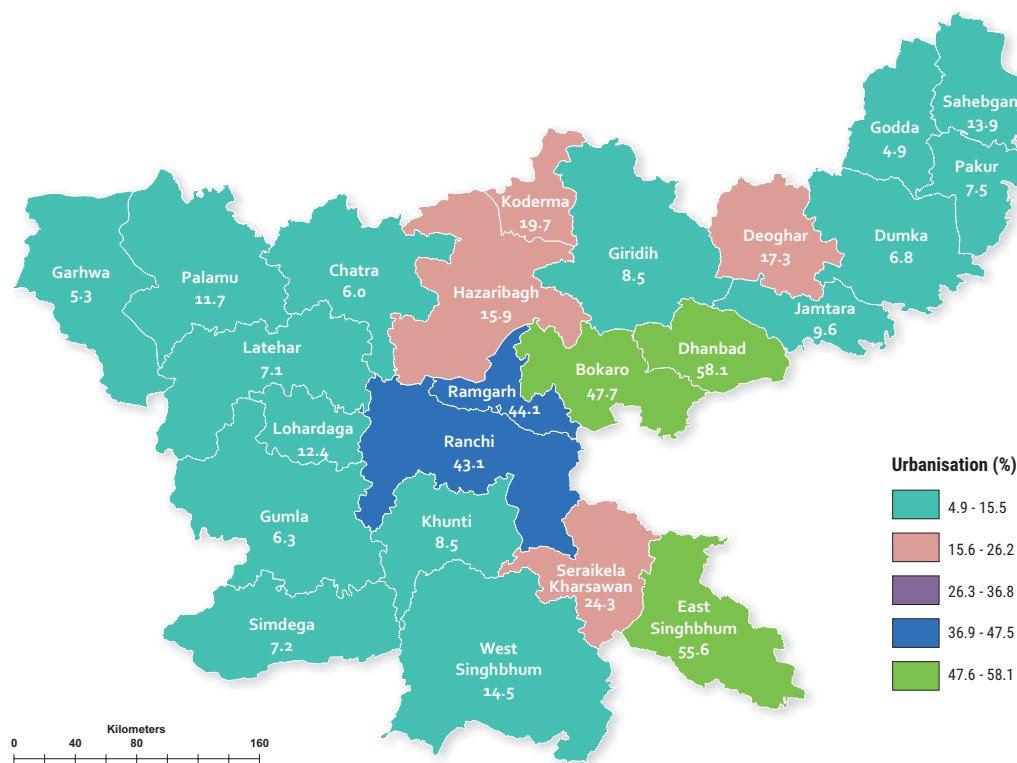
### 2.3.4 Level of Urbanisation

Linking cities with rural areas brings about improvements in food security and nutrition (Niyogi 2017). This helps the small farmers to market their products in nearby town at prevailing market rate. As per the IFPRI report, the global food security depends on the rural-urban linkages. Food remittances from rural to urban areas can be seen as 'social security' (Andersson Djurfeldt and Wambugu 2011) but also as having an important cultural dimension (Kuuire et al. 2013).

Because of the industrial and mining activities, some parts of Jharkhand are more urbanised than most of the major states. Even then the overall level of urbanisation in Jharkhand is less than the national average and almost half of that of the most urbanised states – Tamil Nadu, Kerala and Maharashtra.

Most of the districts in Jharkhand have a very low level of urbanisation. Only five of the districts of the state are highly or moderately urbanised.

**Map 2.4: District-wise Levels of Urbanisation in Jharkhand, 2011**



Source: Computed and prepared by IHD Research team from data compiled from Census of India, 2011.

Purbi Singhbhum (56 per cent), Dhanbad (58 per cent), Bokaro (48 per cent), Ramgarh (44 per cent), and Ranchi (43 per cent) are the districts with more than two-fifth population inhabiting in urban areas (see Map 2.4). However, a comparison across districts throws a startling revelation – the level of urbanisation in the highly urbanised districts is comparable to the most urbanised states, while the least urbanised is comparable to the least urbanised states of the country. Districts registering the lowest urbanisation rate are Godda (4.9 per cent), Garhwa (5.3 per cent), and Chatra (6.0 per cent). Urbanisation offers opportunities for a variety of livelihood options. Migration is also influenced by the extent of urbanisation. Households which have temporary or seasonal access to work in nearby towns have higher incomes than those who don't have access to town.

### 2.4 Food Availability Index and Identification of Cluster

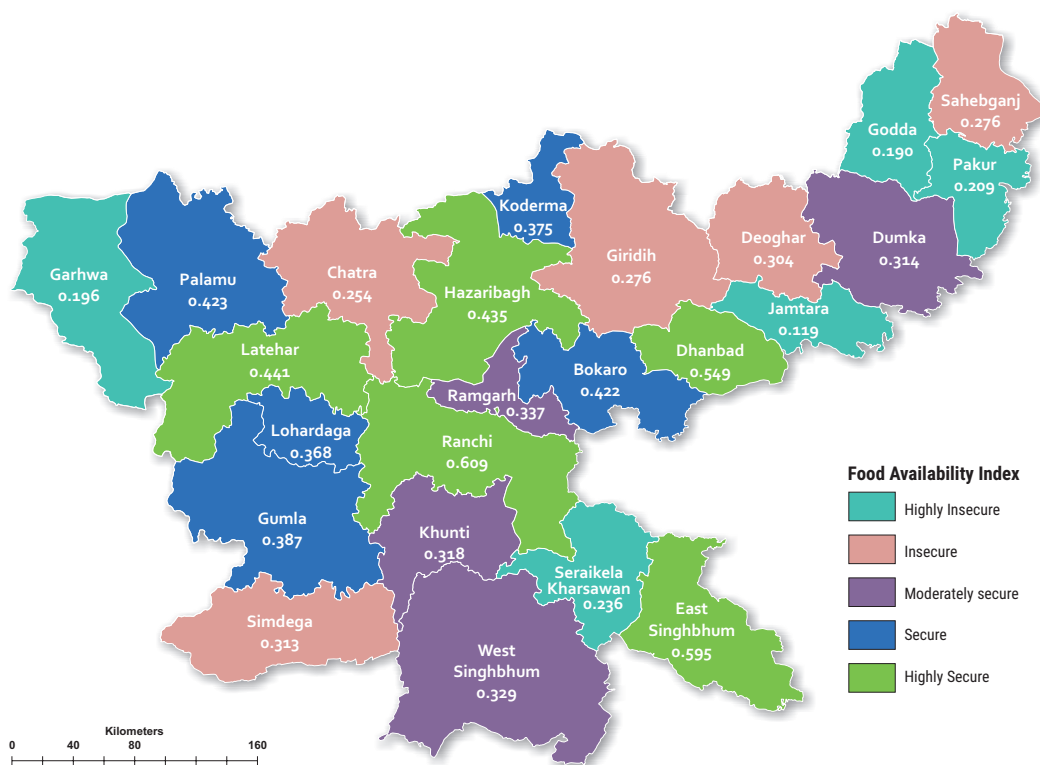
The agricultural economy in Jharkhand is at a very low level of development. As a result, the entire state

has been considered a food deficit state but at the same time inter-district variations are also found in availability indicators and Food Availability Index.

The extent of irrigation has not in all cases been translated into per capita value of cereal output. The districts Latehar, Palamu, Koderma and Garhwa, despite having high irrigation coverage, have a modest or low per capita value of cereal output while districts Khunti, Simdega, Gumla and Purbi Singhbhum despite having low irrigation (less than 10 per cent) have a high value of cereal output. Irrigation has helped more in stabilising agricultural production than in increasing it.

The districts which are extremely food secure in terms of Food Availability Index are Ranchi, Purbi Singhbhum, Dhanbad, Latehar and Hazaribagh. Districts Dhanbad, Purbi Singhbhum and Ranchi are highly urbanised and have low variability of rainfall whereas Ranchi and Purbi Singhbhum districts have registered high per capita value of cereal output. While Hazaribagh district is moderately developed in terms

**Map 2.5: District-wise Food Availability Index of Rural Jharkhand**



Source: Computed and prepared by IHD Research team from data compiled from Census of India, 2011.

**Table 2.5: Indicators Used for Food Availability Index of Rural Jharkhand**

Districts	Rainfall Variability (100-variability) (%)		Per Capita Value of Cereal Output (₹)		Percentage of Net Irrigated Area to Net Sown Area (%)		Urbanisation Rate (%)		Availability index	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Bokaro	73.2	8	324	21	8.1	18	47.7	3	0.422	7
Chatra	66.5	18	463	16	26.0	6	6.0	22	0.254	19
Deoghar	70.4	10	521	13	14.1	11	17.3	8	0.304	16
Dhanbad	80.6	1	373	19	7.5	19	58.1	1	0.549	3
Dumka	69.8	11	1043	6	12.7	12	6.8	20	0.314	14
Purbi Singhbhum	75.8	4	1295	4	2.7	22	55.6	2	0.595	2
Garhwa	56.6	23	473	15	36.0	4	5.3	23	0.196	22
Giridih	69.2	14	446	17	22.6	8	8.5	15	0.276	17
Godda	69.3	13	244	23	12.6	13	4.9	24	0.190	23
Gumla	68.8	16	1931	2	4.2	21	6.3	21	0.387	8
Hazaribagh	80.0	2	549	12	22.9	7	15.9	9	0.435	5
Jamtara	55.7	24	690	10	8.5	16	9.6	14	0.119	24
Khunti	64.8	19	1477	3	9.6	15	8.5	16	0.318	13
Kodarma	69.2	14	321	22	37.3	3	19.7	7	0.375	9
Latehar	69.6	12	520	14	59.3	1	7.1	19	0.441	4

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Districts	Rainfall Variability (100-variability) (%)		Per Capita Value of Cereal Output (₹)		Percentage of Net Irrigated Area to Net Sown Area (%)		Urbanisation Rate (%)		Availability index	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Lohardaga	74.9	5	224	24	33.5	5	12.4	12	0.368	10
Pakur	67.7	17	434	18	11.8	14	7.5	17	0.209	21
Palamu	74.6	6	329	20	44.5	2	11.7	13	0.423	6
Ramgarh	56.8	22	787	9	15.7	9	44.1	4	0.337	11
Ranchi	79.6	3	1172	5	14.6	10	43.1	5	0.609	1
Sahibganj	70.8	9	581	11	8.4	17	13.9	11	0.276	18
Saraikela-Kharsawan	60.0	20	964	7	0.7	24	24.3	6	0.236	20
Simdega	59.1	21	2047	1	5.0	20	7.2	18	0.313	15
Pashchimi Singhbhum	74.1	7	934	8	1.1	23	14.5	10	0.329	12
Total	69.0	-	670	-	18.0	-	29.7	-	0.335	-

Source: Computed by IHD Research team.

of levels of urbanisation and extent of irrigation, it has very low variability of rainfall. However, that has not translated into higher per capita value of cereal output in the district. Latehar district has the highest percentage of net irrigated area to net sown area and is moderately placed in terms of variability of rainfall and per capita value of cereal output.

Except Dumka, the entire Santhal Pargana region (north-eastern part of Jharkhand) is food insecure to highly insecure with regards to food availability (see Table 2.6 and Map 2.5). Godda and Pakur districts are placed as highly food insecure. While Godda has the lowest rate of urbanisation in the state, i.e., below 5 per cent, the per capita value of cereal output is also among the lowest. It is moderately placed in terms of

extent of irrigation. Similarly, Pakur district performs poorly in terms of per capita value of cereal output as well as rate of urbanisation (7.5 per cent). Garhwa and Jamtara districts have the highest rainfall variability and also depict low levels of urbanisation.

The availability of food, however, depends not only on its production expressed in terms of per capita value of cereal output but also on the factors which help in the growth of the food market through growth of non-agricultural income and resultant transport of food from surplus producing areas to deficit areas, and linking habitations to the market. This determines the access to food which has been discussed in details in the following chapter.

**Table 2.6: Status of Districts in Food Availability Index of Rural Jharkhand**

Highly Secure	Secure	Moderately Secure	Insecure	Highly Insecure
Ranchi	Palamu	Ramgarh	Simdega	Saraikela-Kharsawan
Purbi Singhbhum	Bokaro	Pashchimi Singhbhum	Deoghar	Pakur
Dhanbad	Gumla	Khunti	Girdih	Garhwa
Latehar	Kodarma	Dumka	Sahibganj	Godda
Hazaribagh	Lohardaga		Chatra	Jamtara

Source: Computed by IHD Research team.



## ACCESS TO FOOD

Adequate supply of food in a particular region does not guarantee food security of an individual household. The insufficiency of food access needs a policy focus on enhancing income, expenditure, access to market, and prices in achieving food security. In this chapter, we have attempted to understand whether the availability of food translated into consumption of nutritious food among the households. Many a times hunger and self-sufficiency of food coexisted independently (Sen 1981).

Poverty is defined as the lack of sufficient income to purchase a bundle of goods for survival of a person. Hence, food insecurity is assumed to be a sub-category of poverty often called 'food poverty' (Sibrian et al. 2007, Sibrian 2008). Different foods are converted into calories. If the calorie intake of a person is lower than the threshold level as defined by some parameter, he/she is called food insecure. Studies also show that there is discrimination at the intra household level in distribution of food (Berti 2012).

The Sen's (1981) capability approach challenges the Malthusian approach and there was a shift from food availability to people's food access approach. "The entitlement approach concentrates on each person's entitlements to commodity bundles including food, and views starvation as resulting from a failure to be entitled to any bundle with enough food" (Sen 1981). In his pioneer work, Amartya Sen (1981) opined in the context of Bengal famine where people

went hungry and starved, not because food was not available, but because they could not afford it. Hence, he linked the issue of access to a person's entitlement. Thus, availability of food is important to food security but it is not a sufficient condition. It should also be affordable and people should be able to access it. Access is tied up with people's capacity to buy, their earnings, livelihoods, and other socio-economic factors. Access of those who may individually lack the ability to secure enough food is often bolstered through unions, community groups, and self-help groups (SHGs). Thus, the ability to form and take action in groups is also a part of one's entitlements. Historic injustice and discrimination faced by the scheduled castes (SCs) and scheduled tribes (STs), women, and other marginalised groups are well-documented. This discrimination permeates all aspects of life including their livelihood, education, health, participation in political life, and access to food and the benefits of government programmes. The social inclusion and welfare strategy had a significant positive effect on the diet of the beneficiary population (Levy et al. 2019).

The percentage of population below poverty line across states is based on the Tendulkar method of mixed reference period, calculated by the Planning Commission, Government of India. The rural poverty line based on Mixed Recall Period (MRP) in India shows total rural poverty in 2011-12 as 26 per cent. The states that registered the lowest poverty ratio are: Punjab, Himachal Pradesh and Kerala, which is below 10 per cent. On the other hand, Chhattisgarh

registered the highest poverty ratio of 45 per cent followed by 41 per cent in Jharkhand.

As per the Planning Commission, the poverty rate of rural India was 25.7 per cent in 2011-12, which is a reduction of 16 percentage points as compared to 2004-05. Whereas in Jharkhand, the poverty rate was 40.8 per cent in 2011-12 which is a reduction of about 11 percentage points over the same period of time. The poverty rate by social category shows that the percentage of STs below poverty line in 2011-12 in Jharkhand was 52 per cent as compared to 43 per cent at all-India level. The SCs also have a high percentage of population below poverty line. Also, the gap in poverty rate between SCs and STs with the general population is high.

The percentage of expenditure incurred on different food items over two time periods i.e., 2004-05 and 2011-12 for India and Jharkhand shows that the percentage of food expenditure to total expenditure in Jharkhand has reduced from 59.9 per cent to 53.8 per cent over the two periods of time, whereas during the same period rural India registered a reduction from 53.1 per cent to 48.3 per cent. The expenditure on cereal and cereal products decreased consistently. The percentage of expenditure on milk and milk products was 5.5 per cent in Jharkhand as compared to 9.0 per cent in rural India showing a 3.5 percentage point gap.

### 3.1 Dimensions and Indicators of Access to Food

Access is determined by the collection of entitlements regarding people's initial endowment that they can acquire especially in terms of physical and economic access to food. The opportunities are open to people to attain entitlement sets with an adequate amount of food either through their own deeds or through intervention of the state or both. Access to food or food distribution has been regarded to be the most important factor determining food security. A household's access to food depends on its own production of food and the food it can acquire through sale of labour power or commodities produced by it. These are linked to endowment and exchange entitlements. In the words of Amartya Sen (1981), "A person starves either because he does not have the ability to command enough food, or because he does not use this ability to avoid starvation." The entitlement approach concentrates on the former, ignoring the latter possibility.

Access to food thus depends both on the availability of economic opportunities and the social inclusion of the population in availing those opportunities. Here, for Access to Food Index, we have taken six important variables as given below for rural Jharkhand:

**Table 3.1: Food Consumption Pattern\* of Women and Men of Age 15-49 Years in Jharkhand and India, 2019-2021**

Types of food	Women (15-49 years)			Men (15-49 years)		
	India	Jharkhand	Gap (% points)	India	Jharkhand	Gap (% points)
Milk or curd	72.2	53.3	18.9	79.8	61	18.8
Pulses or beans	92.9	94.9	-2	93.2	91.2	2
Dark green leafy vegetables	90.8	96.3	-5.5	92.4	92.3	0.1
Fruits	49.7	36.9	12.8	56.1	39.4	16.7
Eggs	45.1	48.1	-3	57.8	52.2	5.6
Fish	35.7	40.7	-5	45.8	41.5	4.3
Chicken or meat	35.9	39.5	-3.6	46.9	39.7	7.2
Fish, chicken or meat	45.1	47.7	-2.6	57.3	49.2	8.1
Fried foods	43	36.9	6.1	45.1	42.7	2.4
Aerated drinks	15.6	10.2	5.4	25.1	13.9	11.2

Note: \*—Consuming specific foods at least once a week.

Source: NFHS-5, 2019-2021



1. Percentage of agricultural labourers to total workers, 2011.
2. Percentage of SC & ST population, 2011.
3. Dependency ratio, 2011.
4. Average per capita consumption expenditure, 2018-19.
5. Casual wages, 2018-19.
6. Percentage of villages with access to paved road, 2011.

The following indicators have been considered in order to take into account the aspect of food accessibility.

### 3.1.1 Percentage of Agricultural Labourers (Rural)

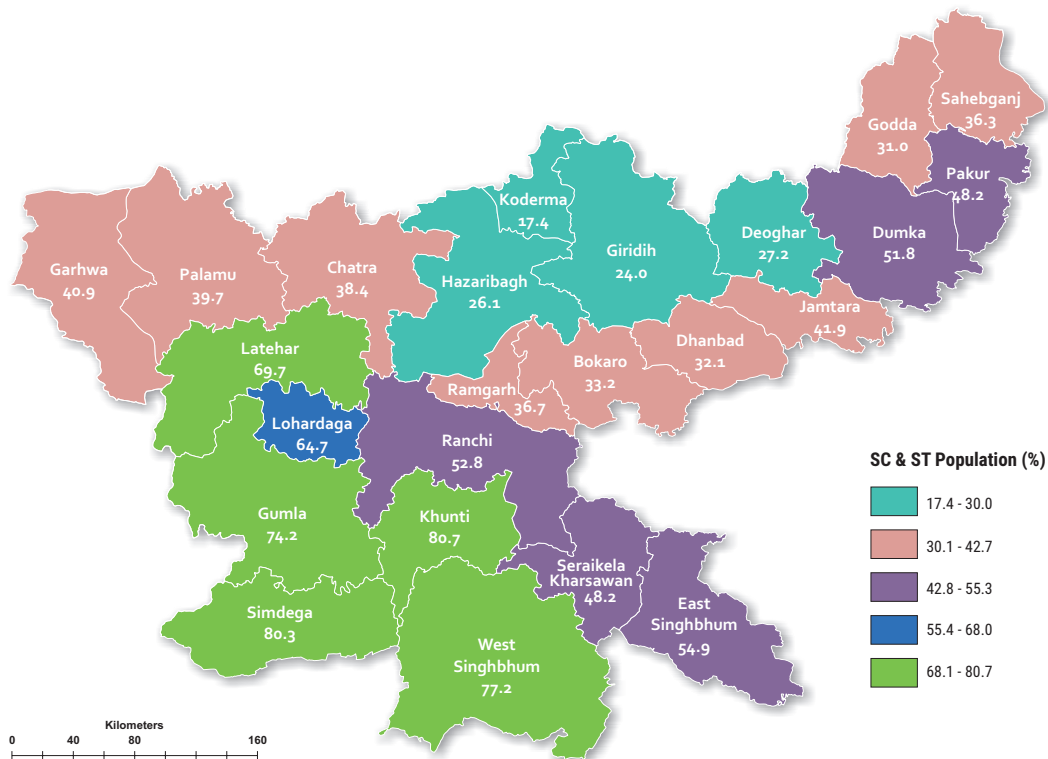
Agricultural labourers are characterised by extremely poor physical and human capital, and also by highest poverty levels (NCEUS 2007). Thus, it is expected that the percentage of agricultural labourers will be negatively related to food security, i.e., the higher the

percentage of agricultural labourers, worse will be the food security situation. Agriculture provides the major source of livelihood and income for a large number of districts, but the involvement of the household in agriculture is mostly in the form of casual labour.

The percentage of agricultural labourers in Jharkhand is almost equal to the national average. States like Assam, Kerala, Jammu & Kashmir, Uttarakhand, Delhi, and Himachal Pradesh have a much lower percentage of agricultural labourers in the total workforce as compared to all-India status. On the other hand, states having higher percentage of agricultural labourers include Bihar, Andhra Pradesh, Chhattisgarh, and Madhya Pradesh.

The percentage of agricultural labourers in the rural workforce is not uniformly high throughout the state. The districts with a presence of industries and mines have a generally low percentage of agricultural labourers. Dhanbad (23 per cent) and Ramgarh (22 per cent) have among the lowest shares of agricultural labourers in the state (Map 3.1). As landlessness is very low among the STs (partly because of the

**Map 3.1: District-wise Percentage of Agricultural Labourers to Total Workers in Rural Jharkhand, 2011**



Source: Computed and prepared by IHD Research team based on data compiled from Census of India, 2011.

restriction on transfer of tribal land), districts with a high concentration of tribal population also have a low percentage of agricultural labourers. Gumla (21 per cent) and Khunti (20 per cent) as a result have a very low percentage of agricultural labourers. Almost all the districts in the Palamu division and Santhal Pargana region have high shares of agricultural labourers (above 40 per cent). The districts in the Palamu division – Garhwa (59 per cent), Palamu (57 per cent), and Chatra (49 per cent) have among the highest shares of agricultural labourers in the state (Map 3.1). These districts are characterised by high shares of SC population, who are mostly landless in rural areas of Jharkhand, and very low shares of ST population.

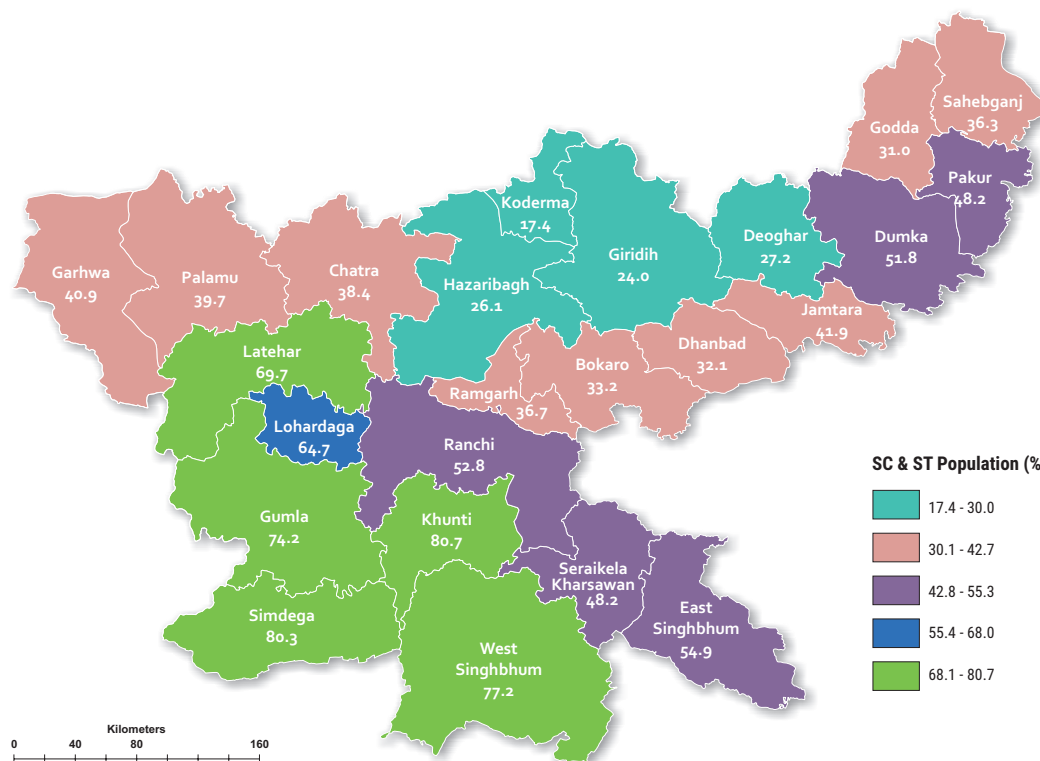
### 3.1.2 Percentage of ST and SC Population (Rural)

The ST and SC households are known to be generally more food insecure, largely on account of their economic and social deprivations – the former on account of geographical marginalisation and the latter

due to historical deprivation and exclusion from the mainstream – all resulting in political marginalisation. The percentage of ST and SC population in a district has been taken as an indicator of this marginalisation. The assumption is that greater the percentage of ST and SC population in a district, lesser will it be associated with food security. Studies show that undernutrition was relatively higher among the households belonging to ST and SC communities, and particularly higher for ST communities (Sen 1992).

In rural Jharkhand, the percentage of tribal population is as high as 31 per cent which is second highest (only to the other tribal state of Chhattisgarh with 37 per cent) in percentage of tribal to total population among the major states. The figure is almost thrice that at the national level. SCs form the other marginalised community, particularly in rural areas. While the STs get marginalised mostly on account of their location, the SCs have faced historical discrimination and social exclusion which accounts for their marginalisation and vulnerable status. SCs constitute around 13 per cent of the rural population

**Map 3.2: District-wise Percentage of Scheduled Caste and Scheduled Tribe Population in Rural Jharkhand, 2011**



Source: Computed and prepared by IHD Research team based on data compiled from Census of India, 2011.

in Jharkhand. Thus, the SCs and STs together constitute 43 per cent of the rural population in the state. This percentage is second only to Chhattisgarh (50 per cent) among the major states.

Within the state, there are wide differences across districts in the composition of population by social groups (see Map 3.2). There are 32 tribal communities including 8 particularly vulnerable tribal groups (PVTGs) in Jharkhand. These are mostly concentrated in the southern and central parts of the state. The southern part of the state extending from the south west to the extreme south is marked by an extremely high percentage of tribal population. The districts of Khunti, Simdega, and Pashchimi Singhbhum are among the 25 most tribal-dominated districts of the country, with the ST population together with the SC population constituting more than 75 per cent of the total rural population. The districts in the north of the state bordering the state of Bihar have a high percentage of SCs and low percentage of STs in their population.

### 3.1.3 Percentage of Working Age Population (Rural)

The ratio between the productive section of the population to the economically dependent part is a valid demographic indicator at the household level. A ratio higher than unity represents a positive scenario,

with more productive population compared to the dependent population. This ‘demographic dividend’, if effectively harnessed, leads to prosperity and hence food security (Chandrasekhar et al. 2006). The percentage of working age population has varied implications for the food security situation in a region. The working age ratio is the ratio between the working age population (15-59 years) and the dependent population (less than 15 years and more than 59 years of age). With development, fertility rates decline and the percentage of population in the working age group increases resulting in a ‘bulge’ in the working age group. This leads to the hypothesis that the ‘demographic dividend’ derived from this gain would accelerate economic growth with a more productive population (Chandrasekhar et al. 2006).

The situation in Jharkhand in terms of the ratio of population in the productive age is found to be worse than in many other states as well as the national average. The southern states in general have a better working age ratio than the northern states. Though it is not the worst performing state, only two of the major states namely Bihar (1.06) and Uttar Pradesh (1.18) have a ratio of working age population less than Jharkhand (1.19). The best performing state – Tamil Nadu (1.83) – is way ahead of it while the worst performing state – Bihar (1.06) – is only marginally worse than it. A low working age ratio implies a greater

**Table 3.2: District-wise Ratio of Working Age Population in Rural Jharkhand, 2011**

District	Value	Rank	District	Value	Rank
Bokaro	1.31	5	Khunti	1.27	9
Chatra	1.08	22	Kodarma	1.11	20
Deoghar	1.13	15	Latehar	1.06	23
Dhanbad	1.35	4	Lohardaga	1.12	17
Dumka	1.29	7	Pakur	1.16	13
Purbi Singhbhum	1.50	1	Palamu	1.10	21
Garhwa	1.03	24	Ramgarh	1.37	2
Giridih	1.11	18	Ranchi	1.30	6
Godda	1.15	14	Sahibganj	1.11	19
Gumla	1.13	16	Saraikela-Kharsawan	1.35	3
Hazaribagh	1.21	12	Simdega	1.28	8
Jamtara	1.26	10	Pashchimi Singhbhum	1.23	11
<b>Jharkhand</b>	1.19				

Source: Census of India, 2011.

dependence on the existing productive population, and may also be related to high out-migration.

A district-wise analysis for the state of Jharkhand shows high disparity between the developed and backward areas. Though in none of the districts is the ratio of working age population close to the best performing states like Tamil Nadu, Kerala, Himachal Pradesh or Delhi, it is high in districts developed in industrial and mining activities like Purbi Singhbhum (1.50), Ramgarh (1.37), Dhanbad (1.35), or in agriculture like Dumka (1.29) (see Table 3.2). It is less in Garwha (1.03), Latehar (1.06) Chatra (1.08), and Palamu (1.10).

The differential ratio between the developed and backward regions can probably be explained by out-migration from the latter to the former. The change in working age population is highly influenced by the movement of the population in this age group. In a developing region, young people move out in search of employment. As a result, the developing districts of the state have a lower percentage of working age population. On the other hand, movement of the working age population to the industrialised and urbanised districts seems to have caused a high ratio of working age to dependent age population in districts like Purbi Singhbhum, Dhanbad, Bokaro or Ranchi.

These people who migrate due to lack of employment opportunities have little food security in their villages but are just as vulnerable in the destination areas. Several studies have shown the situation of migrant workers within and outside the state to be quite deplorable (Jha 2005). The in-migrants in the destination area suffer from exploitation of different kinds at the hands of their employers who rarely provide anything apart from wages, and the labourers have to fend for themselves to meet their basic requirements (Srivastava & Sasikumar 2003).

### 3.1.4 Monthly Per Capita Consumption Expenditure (Rural)

The National Sample Survey (NSS) estimates of per capita consumption expenditure, adjusted for inequality, is a proxy for per capita income reflecting a significant dimension of access to food. This variable

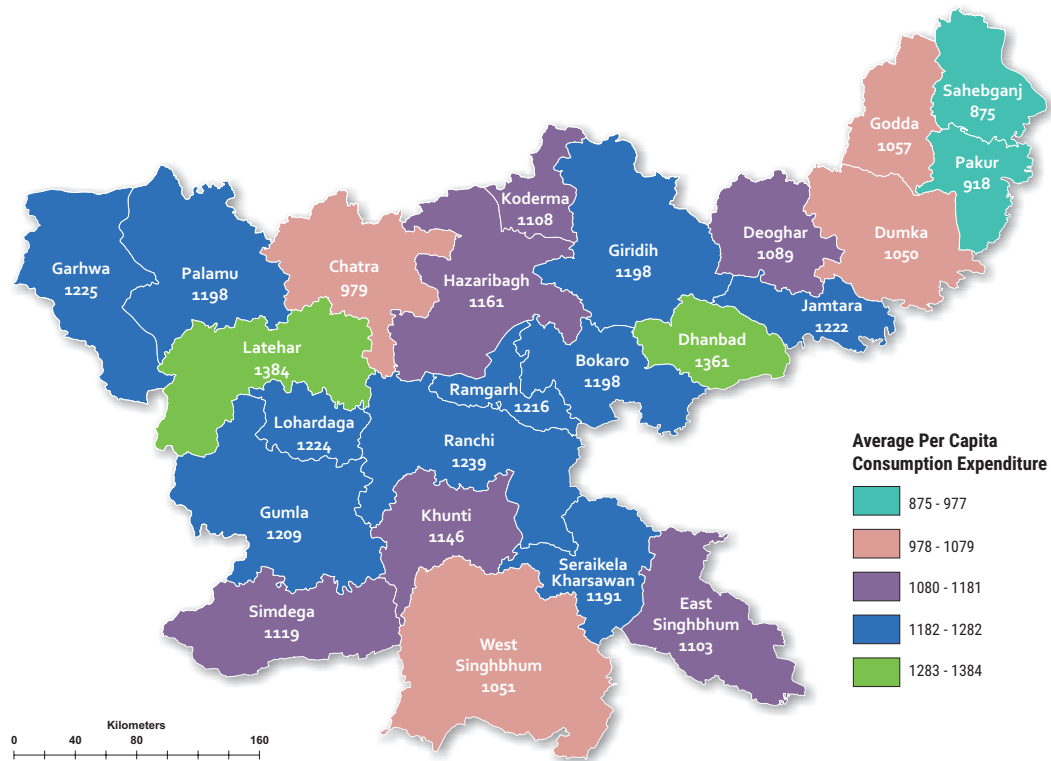
accounts for all sources of income, including those which are depicted through availability of food as measured in terms of value of agricultural output. For instance, a district with low value of agricultural output along with a high value of consumption would mean that non-agricultural income, including remittances from migrants, plays a role in enabling consumption to be higher than agricultural production. This is the only way in which we can indirectly bring migration, which is such a crucial component of households' food security strategies, into the picture.

Low wage levels directly affect consumption patterns. Per capita consumption expenditure is a good indicator of food security in rural areas. Jharkhand compares very unfavourably with other states in terms of consumption expenditure. The value of Monthly Per Capita Consumption Expenditure (MPCE) in rural Jharkhand (₹920) is substantially lower than the national average (₹1287), and less than half as compared to the states Delhi, Kerala, Punjab and Haryana. Only two states i.e., Odisha (₹905), and Chhattisgarh (₹904) have lower figures. Even Bihar (₹970), of which it was a part a few years back, is slightly better off.

Though the state as a whole has very low consumption levels, there are also stark disparities in consumption levels within the state. Map 3.3 show that districts of Latehar, Dhanbad, and Ranchi registered the three highest MPCE levels among the 24 districts of Jharkhand. On the other hand, districts like Sahibganj, Pakur, Chatra, and Dumka are at the lower end in terms of MPCE. The MPCE is lowest in Sahibganj (₹870) which is only 63 per cent of the MPCE of Latehar (₹1384).

### 3.1.5 Casual Wage Rate (Weekly) of Rural Persons

Casual wage workers constitute about one-fifth of the workers in the unorganised non-agricultural sector, while almost all agricultural labourers are casual workers (NCEUS 2007). Casual workers tend to be the least protected and have the lowest level of earnings. The understanding is that the casual workers in the unorganised non-agricultural sector as well as

**Map 3.3: District-wise MPCE (in ₹) in Rural Jharkhand, 2018-19**

Source: Computed and prepared by IHD Research team based on Unit Level NSS Data, 2018-19.

the agricultural labourers are particularly vulnerable to food insecurity without the backing of self-produced food. There is, therefore, a particular concern with the earnings of casual workers agricultural labourers.

Studies shows that wage is a direct measure of economic well-being, such as food security. Enough financial resources provide its members with adequate supplies of nutritional and safe foods.<sup>1</sup> Casual workers tend to be the least protected and have the lowest level of earnings. The NSS defines the casual wage worker as one who was casually engaged in others' farm or non-farm enterprises (both household and non-household) and, in return, received wages according to the terms of the daily or periodic work contract.

The casual wage rate depends on the availability of economic opportunities in the state. The weekly casual wage rates are high in the districts of Deoghar (₹1562), Latehar (₹1526), and Ramgarh (₹1514). On the other hand, the districts registering lowest weekly

casual wage rates are Garhwa (₹649), Bokaro (₹746), and Dhanbad (₹800) (Map 3.4).

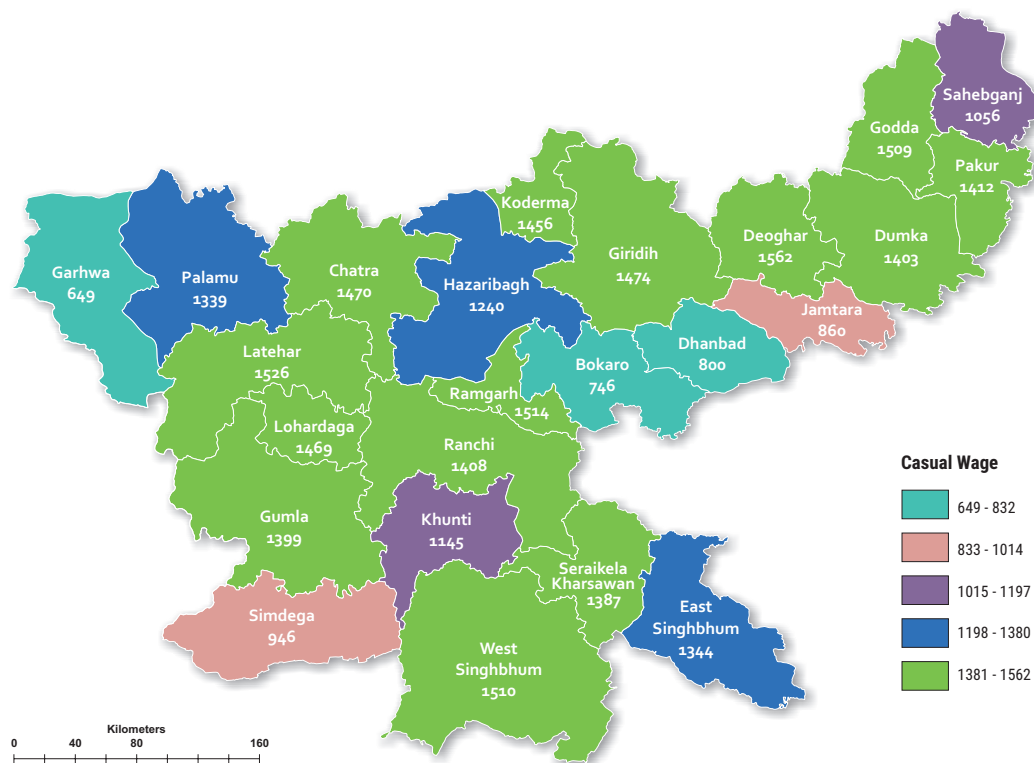
### 3.1.6 Percentage of Villages with Access to Paved Roads, 2011

Access to paved roads has a big role in development. It reduces transport costs and can reduce transaction costs, with possible positive results on the prices realised by farmers. By improving communication, roads can increase the options available to rural producers, connecting them with larger national, regional, and even international markets. Studies of rural roads have shown that they raise the productivity and value of land for poor farmers (Jacoby 2000). It has been found that government spending on rural infrastructure, besides agricultural research and development, irrigation and rural development programmes targeted to the rural poor, have all contributed to reductions in rural poverty and increases in agricultural productivity. Marginal government

1. <https://www.issuelab.org/resources/2755/2755.pdf>



**Map 3.4: District-wise Casual Wage Rates (Weekly) of Rural Persons (in ₹) in Jharkhand, 2018-19**



Source: Computed and prepared by IHD Research team based on PLFS, 2018-19.

expenditure on roads, in particular, has been found to have the largest positive impact on productivity growth (Fan et al. 1999). Roads in rural areas act as feeder roads serving such areas where agriculture is the predominant occupation, providing them with outlets to urban market centres. These roads also play a significant role in opening up backward areas and accelerating socio-economic development.

As seen from the Map 3.5, rural connectivity is good in Jharkhand. The districts of Dhanbad, Gumla, Lohardaga, and Ramgarh registered 100 per cent of villages connected to paved road as per Census 2011. Godda (79 per cent), Sahibganj (84 per cent), and Ranchi (86 per cent) have the lowest percentage of villages with access to paved road connectivity.

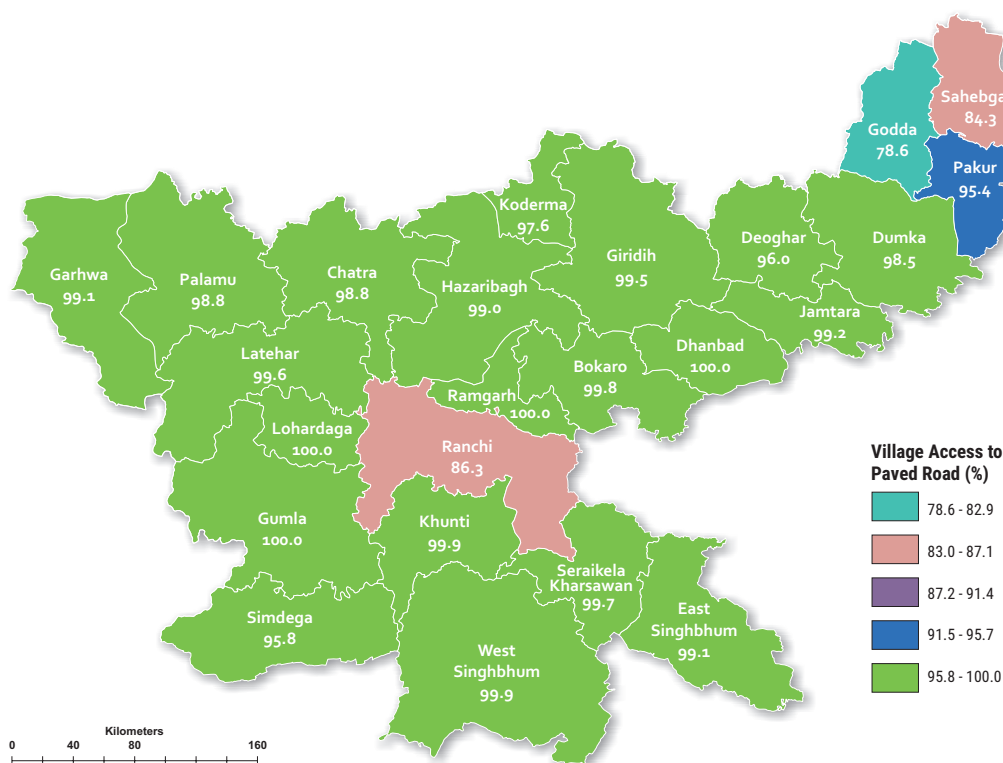
### 3.2 Access to Food Index and Identification of Cluster

Table 3.3 summarises the findings of access indicators and Access to Food Index. Ramgarh and Dhanbad districts which have emerged as highly food secure

in terms of access to food are highly urbanised and are marked by a high level of mining and industrial activities. Hence, the non-dependency rate in these districts is very high. In both the districts, mining and industrial activities associated with urban areas offer employment and income opportunities to large number of its population, as a result of which the MPCE is very high. At the same time, the percentage of villages with access to paved roads and percentage of non-agricultural workers are found to be very high in these districts (see Table 3.3). The performance of these districts across all these component indicators have made them highly secure in terms of access to food.

The other three highly secure districts namely, Giridih, Hazaribagh, and Koderma have higher casual wage rates and better rural connectivity. On the other hand, Pakur, Sindega, Godda, Garhwa, and Sahibganj are at the lower ladder of the Access to Food Index (see Tables 3.3 and 3.4).

**Map 3.5: District-wise Percentage of Villages with Access to Paved Roads in Jharkhand, 2011**



Source: Computed and prepared by IHD Research team based on data from Census of India, 2011.

**Table 3.3: Indicators Used to Compute Access to Food Index of Rural Jharkhand**

District	Percentage Agricultural Labourers to All Labourers		Percentage SC&ST Population		Non-Dependency Ratio		Average Monthly Per Capita Consumption Expenditure		Casual Wages (Weekly)		Percentage of Village Access to Paved Road		Access	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Index	Rank
Bokaro	28.5	6	33.2	7	1.31	5	1198	11	746	23	99.8	7	0.640	8
Chatra	49.4	20	38.4	10	1.08	22	979	22	1470	7	98.8	16	0.506	19
Deoghar	43.2	15	27.2	4	1.13	15	1089	18	1562	1	96.0	19	0.615	10
Dhanbad	22.8	4	32.1	6	1.35	4	1361	2	800	22	100.0	1	0.746	2
Dumka	50.3	21	51.8	16	1.29	7	1050	21	1403	12	98.5	17	0.553	16
Purbi Singhbhum	45.5	17	54.9	18	1.50	1	1103	17	1344	15	99.1	12	0.652	7
Garhwa	58.7	24	40.9	12	1.03	24	1225	4	649	24	99.1	13	0.378	23
Giridih	36.8	10	24.0	2	1.11	18	1198	10	1474	6	99.5	10	0.690	5
Godda	57.2	22	31.0	5	1.15	14	1057	19	1509	5	78.6	24	0.394	22
Gumla	20.6	2	74.2	21	1.13	16	1209	8	1399	13	100.0	1	0.628	9
Hazaribagh	29.4	7	26.1	3	1.21	12	1161	13	1240	17	99.0	14	0.692	4
Jamtara	44.3	16	41.9	13	1.26	10	1222	6	860	21	99.2	11	0.556	15
Khunti	19.8	1	80.7	24	1.27	9	1146	14	1145	18	99.9	6	0.595	11
Kodarma	28.4	5	17.4	1	1.11	20	1108	16	1456	9	97.6	18	0.694	3
Latehar	47.2	19	69.7	20	1.06	23	1384	1	1526	2	99.6	9	0.576	14
Lohardaga	39.1	11	64.7	19	1.12	17	1224	5	1469	8	100.0	1	0.586	13

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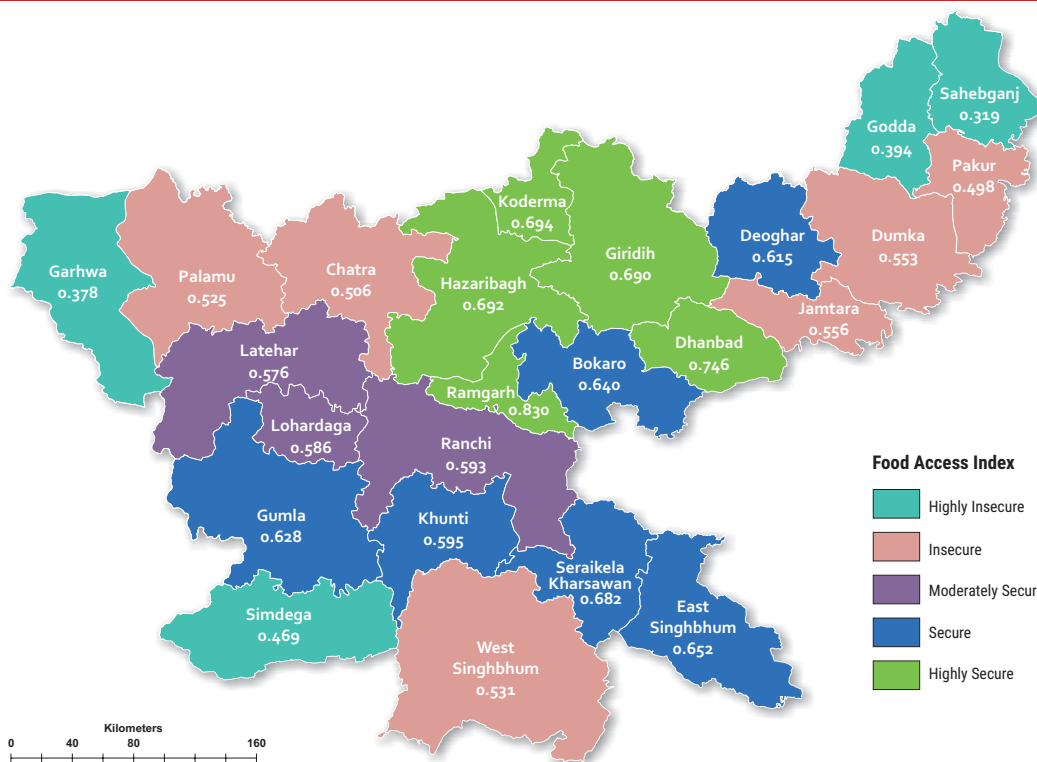
District	Percentage Agricultural Labourers to All Labourers		Percentage SC&ST Population		Non-Dependency Ratio		Average Monthly Per Capita Consumption Expenditure		Casual Wages (Weekly)		Percentage of Village Access to Paved Road		Access	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Index	Rank
Pakur	39.1	12	48.2	14	1.16	13	918	23	1412	10	95.4	21	0.498	20
Palamu	57.3	23	39.7	11	1.10	21	1198	9	1339	16	98.8	15	0.525	18
Ramgarh	21.6	3	36.7	9	1.37	2	1216	7	1514	3	100.0	1	0.830	1
Ranchi	33.5	9	52.8	17	1.30	6	1239	3	1408	11	86.3	22	0.593	12
Sahibganj	45.6	18	36.3	8	1.11	19	875	24	1056	19	84.3	23	0.319	24
Saraikela-Kharsawan	40.2	13	48.2	15	1.35	3	1191	12	1387	14	99.7	8	0.682	6
Simdega	32.0	8	80.3	23	1.28	8	1119	15	946	20	95.8	20	0.469	21
Pashchimi Singhbhum	42.1	14	77.2	22	1.23	11	1051	20	1510	4	99.9	5	0.531	17
Total	40.3		44.0		1.195		1151		1290		96.4		0.579	

Source: Computed by IHD Research team.

The districts of Santhal Pargana region – Godda, Sahibganj, Jamtara, Dumka, and Pakur – are either highly insecure or food insecure districts in terms of composite Access to Food Index. The production and productivity of the agricultural sector in these districts are low. The tribal-dominated districts are moderately

to highly insecure in terms of access to food. Simdega district, with over 80 per cent ST and SC population, fares poorly in terms of rural casual wages and rural connectivity and is therefore ranked as highly insecure in terms of access to food.

**Map 3.6: District-wise Access to Food Index of Rural Jharkhand**



Source: Computed and prepared by IHD Research team.



**Table 3.4: Status of Districts in Access to Food Index of Rural Jharkhand**

Highly Secure	Secure	Moderately Secure	Insecure	Highly Insecure
Ramgarh	Saraikela-Kharsawan	Khunti	Jamtara	Pakur
Dhanbad	Purbi Singhbhum	Ranchi	Dumka	Simdega
Kodarma	Bokaro	Lohardaga	Pashchimi Singhbhum	Godda
Hazaribagh	Gumla	Latehar	Palamu	Garhwa
Giridih	Deoghar		Chatra	Sahibganj

Source: Computed by IHD Research team.

Almost the entire North Chotanagpur division, constituting districts of Hazaribagh, Koderma, Giridih, Ramgarh, Bokaro, and Dhanbad, emerged as highly food secure in terms of access to food. This mining-industrial and highly urbanised region is characterised by higher shares of working age

population, lower shares of agricultural labourers and ST & SC population, higher casual wage rates, and better rural connectivity. An improvement in access to employment opportunities, through industrialisation and urbanisation, can go a long way in improving the access to food condition in the highly insecure regions.



## UTILISATION OF FOOD

**F**ood utilisation is defined by USAID<sup>1</sup> as a condition wherein “food is properly used; proper food processing and storage techniques are employed; adequate knowledge of nutrition and child care techniques exist and is applied; and adequate health and sanitation services exist.” Food utilisation is the process by which our body absorbs the nutrition from the food that we consume. Sufficient energy and nutrient intake by individuals are the result of good feeding practices, food preparation, diversity in the diet, and intra-household distribution of food. This, combined with good biological utilisation of food consumed, determines the nutritional status of individuals (FAO 2008). The ability of the body to translate food intake into nutritional status is mediated by a number of factors, some genetic and others related to hygiene and morbidity.

### 4.1 Dimensions and Indicators of Food Utilisation

The following five indicators have been chosen to determine a broad picture of food utilisation

1. Access to safe drinking water.
2. Access to primary health services – Primary Health Centre (PHC)/Community Health Centre (CHC).

3. Female literacy rate.
4. Disease and health behaviour.
5. Access to improved toilet facility.

#### 4.1.1 Access to Safe Drinking Water (Rural)

Water is a key determinant of food and nutrition security (FNS). It is the heart of the eco-system including forest, lake and water fall, and FNS depends on this eco-system. Water in appropriate quantity and quality is needed for three essential purposes like drinking, sanitation, food production/processing. The United Nations General Assembly (UNGA) held on 28 July 2010 in their resolution 64/292 declared access to clean drinking water and sanitation as a human right.<sup>2</sup> But right to water in the context of right to food is a complex question. While drinking and cooking water would be protected, water for food production would probably not be covered under the minimum needs in arid areas.<sup>3</sup> Lack of clean water has a negative consequence on health and hygiene of people especially of the poor (Suting 2016). Studies have shown that water and sanitation accounts for a substantial portion of the difference in infant and child mortality rates experienced by the rich and the poor (Leipziger et al. 2003). Clean and safe water supply is an essential element for achieving

1. <https://www.marketlinks.org/sites/default/files/resource/files/USAID%20Food%20Security%20Definition%201992.pdf>

2. <https://news.un.org/en/story/2010/07/346122-general-assembly-declares-access-clean-water-and-sanitation-human-right>

3. [https://www.un.org/waterforlifedecade/food\\_security.shtml](https://www.un.org/waterforlifedecade/food_security.shtml)

food security and good nutrition. Though India has taken huge strides in terms of provision of safe drinking water since Independence, the fact remains that more people in India lack this basic minimum necessity now than 50 years ago. This is besides the fact that more people are vulnerable to water-borne diseases (Gujja & Shaik 2005). The quality of drinking water conditions the effective absorption of nutrients by the human body. Empirical studies have shown that water quality is a big problem in rural areas (Krishnan et al. 2003). Almost 20 lakh children die each year because of lack of clean water and lack of sanitation (UNICEF 2007). The availability and quality of potable water is a big factor that affects food insecurity. Drinking water also provides important micronutrients particularly fluoride, and calcium (Olivares & Uauy 2005; Wenhold & Faber 2009). Poor water quality is a major cause of diarrhoea and several other waterborne diseases which also lead to food and nutrition insecurity. Intra household distribution of water is also one of the important aspects on which not much research has been done. “It is not enough to know the average

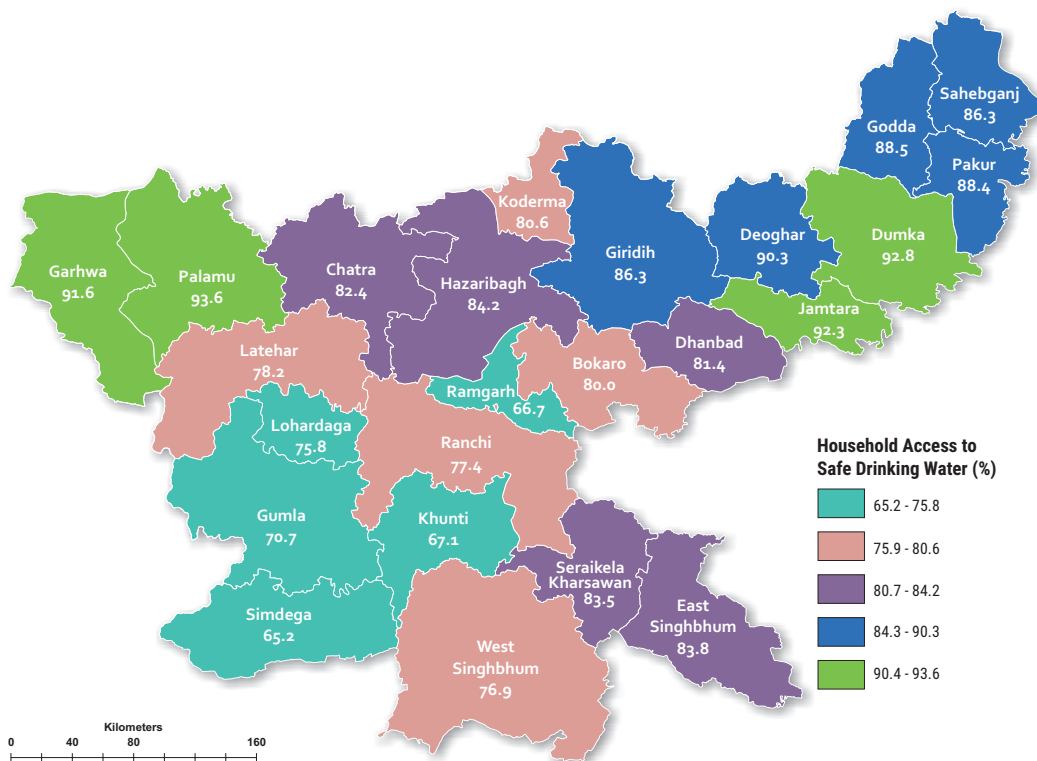
water availability: there is a need to know about water distribution and how people ‘live’ their water reality” (Mehta and Movik 2014).

Among major states except Maharashtra, Madhya Pradesh, Assam and Jharkhand, all other major states recorded above 90 per cent population having access to improved sources of drinking water in rural areas. Jharkhand stands at the lowest rank with 84 per cent of population with access to improved sources of drinking water. As compared to all-India, Jharkhand recorded 11-percentage points lesser percentage of households in terms of access to improved water.

Here for computing the composite index of utilisation, we have defined safe drinking water as water obtained from the protected sources viz., tube-well, tap, bottled water, water from covered well.

The district-level percentage of households using safe drinking water is taken from NFHS-5 (2019-2021). As per the NFHS-5, about 84 per cent of the household have access to safe drinking water in rural

**Map 4.1: District-wise Percentage of Households with Access to Safe Drinking Water in Rural Jharkhand, 2019-2021**



Source: Computed and prepared by IHD Research team based on NFHS-5, 2019-2021.

Jharkhand. There is a wide district-level variation in access to safe drinking water (Map 4.1). Palamu (94 per cent) and Garhwa (92 per cent) districts in the Palamu division account for the highest shares of rural households with access to safe drinking water. The entire Santhal Pargana region has better coverage of safe drinking water, well above the state average. Dumka (93 per cent) and Jamtara (92 per cent) registered among the highest percentages of rural households with access to safe drinking water. Almost the entire South Chotanagpur division, constituting the highly tribal dominated districts of Simdega (65 per cent), Khunti (67 per cent), Gumla (71 per cent) and Lohardaga (76 per cent), have among the lowest shares of rural households with access to safe drinking water. The main source of drinking water in these areas are open or uncovered dug wells, which are not protected and is therefore considered an unsafe source of drinking water.

#### 4.1.2 Access to Primary Health Services (Rural)

Public health services, which reduce a population's exposure to disease through such measures as sanitation and vector control, are an essential part of a country's development infrastructure. The health infrastructure prevents the local inhabitants from exposure to diseases, for instance, through assuring food safety, vector control, and health education to improve personal health behaviour (Gupta 2005). In rural areas, general delays in seeking health care for disease was also found which affects FNS (Pande 2003). Studies found that poor supply of government services like immunisation and medical care and lack of priority to primary health care in government programme contributes to morbidity (Saxena 2018).

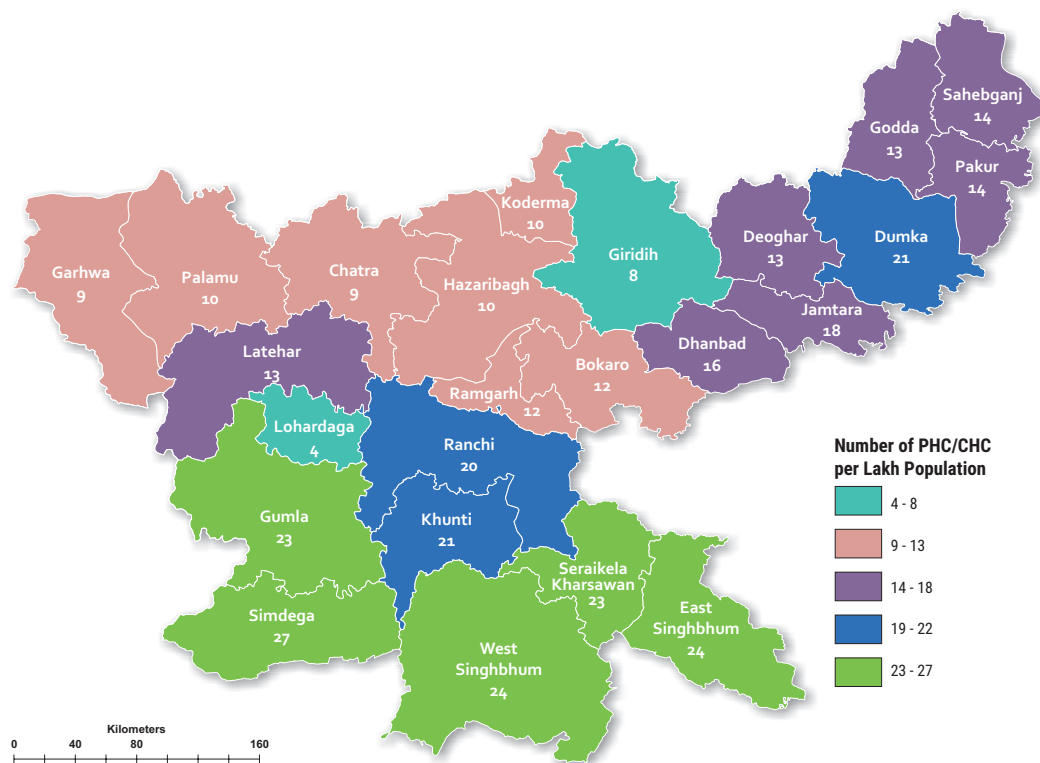
It has been estimated that in developing countries, one out of five people do not use safe water, and roughly half are without adequate sanitation (WHO 2007). Primary health services in the country as a whole is utterly inadequate, particularly in rural areas. There are persistent gaps in human resources and infrastructure, disproportionately affecting the less developed rural areas. A significant percentage of hospitals do not have adequate personnel, diagnostic,

and therapeutic services and drugs. In a state like Jharkhand, with a high burden of communicable and non-communicable diseases because of persisting poverty, primary health infrastructure at the village level assumes huge significance. However, a good number of villages in the state are not adequately covered by a PHC, the most critical health facility in rural areas. Jharkhand Economic Survey 2018-19 shows more than 10 per cent PHCs in Jharkhand and over 20 per cent in Chhattisgarh function without doctors.

Only one PHC has been provided for as many as 99 villages in Jharkhand compared to 25 for all-India level. Again, only one Sub-Centre is there for every 8 village as compared to 4 villages at all-India level. This clearly indicates the lack of health care services for the rural population in Jharkhand in the light of high pressure on limited resources. This compares poorly to a state like Kerala that has excellent health infrastructure in the rural areas (all villages have at least one PHC). Lack of primary public health facility forces the vulnerable population to depend on private health services, often leading to indebtedness in rural areas. In rural areas, all the health services are pivoted around the PHCs, hence we have taken access to them as an indicator determining food absorption. For the Food Utilisation Index, we have considered district-wise PHCs/CHCs per lakh population as a contributing variable.

All districts in the state have very poor status in terms of access to health care services (Map 4.2). Interestingly, almost the entire tribal dominated South Chotanagpur and Kolhan Divisions, constituting districts of Simdega (27), Pashchimi Singhbhum (24), Purbi Singhbhum (24), Gumla (23), Saraikela-Kharsawan (23), and Khunti (21) emerge as best performing with more than 20 PHC/CHCs per lakh population. However, some of the most industrialised and urbanised districts like Bokaro (12), Ramgarh (12), Dhanbad (16), and Hazaribagh (10), perform very poorly in rural health infrastructure. A pointer towards the inadequacy of growth poles as a development strategy in tribal areas and the need to tackle the paucity of health intervention in rural areas.

**Map 4.2: District-wise Number of PHCs/CHCs per Lakh Population in Rural Jharkhand, 2018-19**



Source: Computed and prepared by IHD Research team based on data from Ministry of Health and Family Welfare, Government of India.

### 4.1.3 Rural Female Literacy

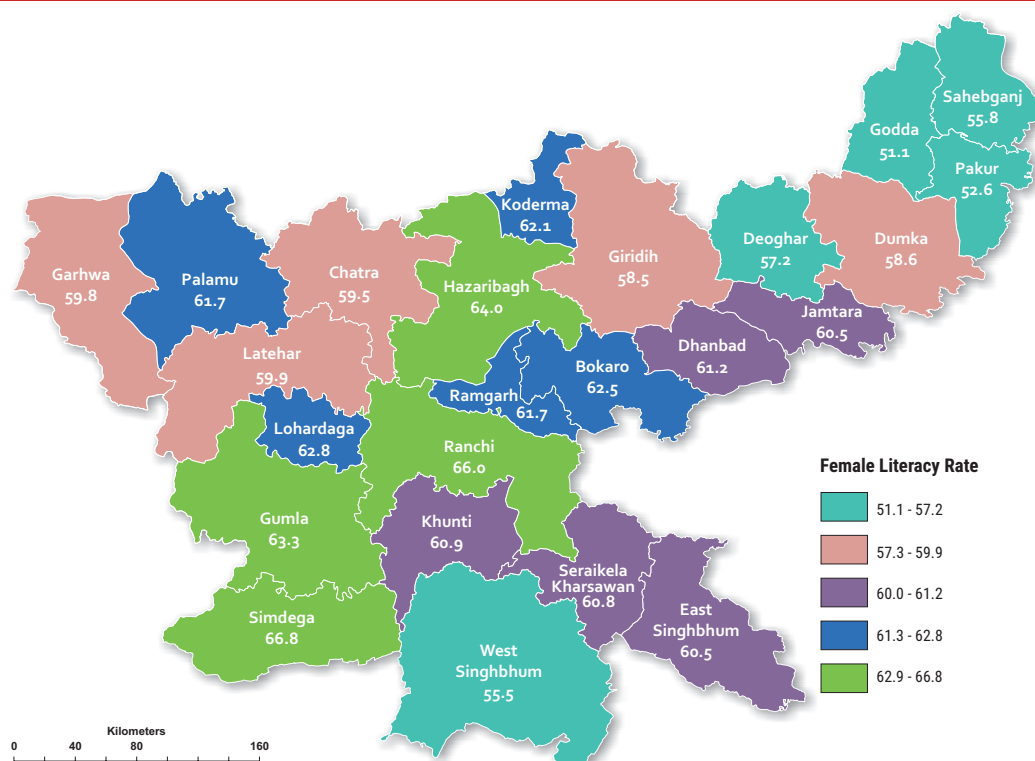
Education is considered as a human capital to measure productivity and efficiency (Mutisya et al. 2016). Education has a direct impact on enhancing income, improving health, and fostering better decision making. ((McMahon 2009; Psacharopoulos & Woodhall 1997). Education is also considered to be a key determinant of social mobility by pulling individuals out of poverty. Education also influences food security through better access to information on agricultural production, nutrition and sanitation, increased efficiency, and better decision making (De Muro & Burchi 2007; Bashir & Schilizzi 2013). The Study by Bashir and Schilizzi (2013) also shows that households with members with better education are more food secure as education increased the purchasing power.

We have used rural female literacy rate as a variable to represent gender-based inequality in household consumption. The argument is that a higher literacy rate for women is more likely to enable women to enhance their roles in family’s decision making and

increase their share of household consumption. At the same time, higher women’s literacy is also likely to lead to better knowledge of nutritional systems and improved health practices in the household. Enhancing female literacy has been recognised as the single most important factor contributing to increase in food security and decline in malnutrition and mortality levels (Save the Children 2008).

Among the major states, Jharkhand (60 per cent) and its former parent state of Bihar (58 per cent) are among the five worst performing in rural female literacy. Jharkhand is around 7 percentage points below the national average and almost 34 percentage points below the best performing state of Kerala.

There are large district-level disparities in rural female literacy rates. Rural female literacy is generally very low in the entire Santhal Pargana Division (the north eastern part of the state). Godda (51 per cent) and Pakur (53 per cent) districts of the Santhal Pargana have the lowest rural female literacy rates (see Map 4.3). Most parts of the North and South Chotanagpur

**Map 4.3: District-wise Rural Female Literacy Rates (in %) in Jharkhand, 2019-2021**

Source: Computed and prepared by IHD Research team based on NFHS-5, 2019-2021.

Divisions have rural female literacy rates above 60 per cent. Interestingly, it is highest in the tribal dominated district of Simdega (67 per cent) which is equivalent to the national average and is at par with the developed state of Karnataka. Simdega is closely followed by districts of Ranchi (66 per cent) and Hazaribagh (64 per cent) which are more developed in terms of industrialisation and urbanisation.

Though female literacy is low among tribals, all tribal districts do not have low female literacy rates. Gumla for example has a very high concentration of tribal population (as per the Census 2011, tribals constitute 69 per cent of its population) but has a high rural female literacy (63 per cent). The inter-tribe differentiation in female literacy is one of the main reasons behind it. Gumla is mainly inhabited

**Table 4.1: Female Literacy Rates of PVTGs, STs and Total Females of Jharkhand (in %)**

	2001	2011
Total Females - Jharkhand	38.9	56.2
All ST Females - Jharkhand	27.2	46.2
All Females of PVTGs - Jharkhand	11.4	30.0
Asur	14.7	35.4
Birhor	11.2	27.4
Birjia	19.0	38.4
Korwa	6.5	29.7
Mal Pahariya	12.1	30.2
Pahariya	5.5	24.3
Sauria Pahariya	11.3	30.6
Savar	10.7	24.0

Source: Calculated from Census 2001 and 2011.



by Oraon and Kharia tribes who have higher female literacy rates than the rest of the tribal communities in Jharkhand. A wide inter-tribe difference in literacy rate is clearly visible in Table 4.1. About 38 per cent of females from Birjia tribe are literate, while only 24 per cent females from Savar and Pahariya tribes are literate among the PVTGs.

#### 4.1.4 Disease and Health Behaviour (Rural)

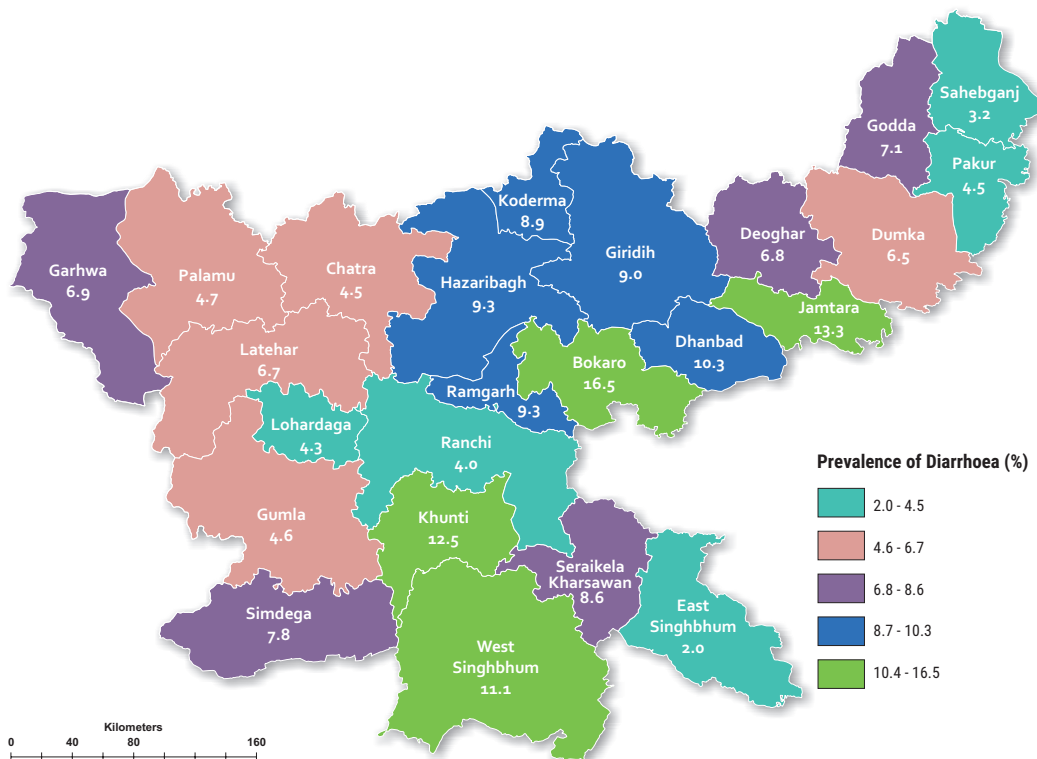
There is a clear association between morbidity and severe food insecurity. Gubert et al. (2016) found a high degree of association between severe food insecurity and the prevalence of common morbidities. They also show that severely food-insecure children had a greater likelihood of experiencing cough and being hospitalised with diarrhoea. According to WHO (2010), food- and water-borne diarrhoea kill an estimated 22 lakh people annually. Repeated bouts of diarrhoea prevent children from achieving normal physical and cognitive development, while poor nutrition weakens the immune system, leading to more frequent bouts of diarrhoea (WHO 2010). Also, infection impacts the nutritional status. It is estimated

that the provision of safe drinking water, adequate sanitation, and hygiene education could prevent at least 860,000 child deaths per annum (Prüss-Üstün et al. 2008).

Without access to proper sanitation and hygiene, food is easily contaminated. This can cause diarrhoea and other intestinal diseases and eventually, under-nutrition. It is a vicious cycle—intestinal diseases contribute to under-nutrition through decreased nutrient absorption, while under-nutrition reduces the body’s ability to fight off further infections. Due to lack of sanitation, children are at a high risk of diarrhoea.

The prevalence of diarrhoea among children aged 0–5-year in rural areas was 7.7 per cent at all-India level in 2019-2021 which has reduced by around 2 percentage points since 2015-16. The prevalence of diarrhoea in rural Jharkhand marked a slight increase from 7.1 per cent to 7.3 per cent during 2015-16 and 2019-2021. The states like Bihar, Delhi, Maharashtra, Gujarat, Telangana, Andhra Pradesh, marked higher prevalence of diarrhoea among children in rural areas

**Map 4.4: District-wise Prevalence of Diarrhoea among Children Under 5 Years in Rural Jharkhand (%), 2019-2021**



Source: Computed and prepared by IHD Research team based on NFHS-5, 2019-2021.



as compared to Jharkhand. The prevalence in rural Chhattisgarh was the lowest at 3.7 per cent which is almost less than half compared to Jharkhand’s figure.

Map 4.4 shows the prevalence of diarrhoea among children under 5 years in rural areas of Jharkhand across districts. Purbi Singhbhum (2 per cent) recorded the lowest prevalence of diarrhoea among children, followed by Sahibganj (3.2 per cent) and Ranchi (4 per cent). Most of the districts of Santhal Pargana Division and the entire Palamu Division marked lower prevalence of diarrhoea among children in rural areas which was below the state average. On the other hand, the districts of North Chotanagpur Division were marked with high prevalence as compared to the state figures. Bokaro (17 per cent) and Jamtara (13 per cent) have the highest prevalence of diarrhoea, followed by the tribal dominated districts of Khunti (13 per cent) and Pashchimi Singhbhum (11 per cent).

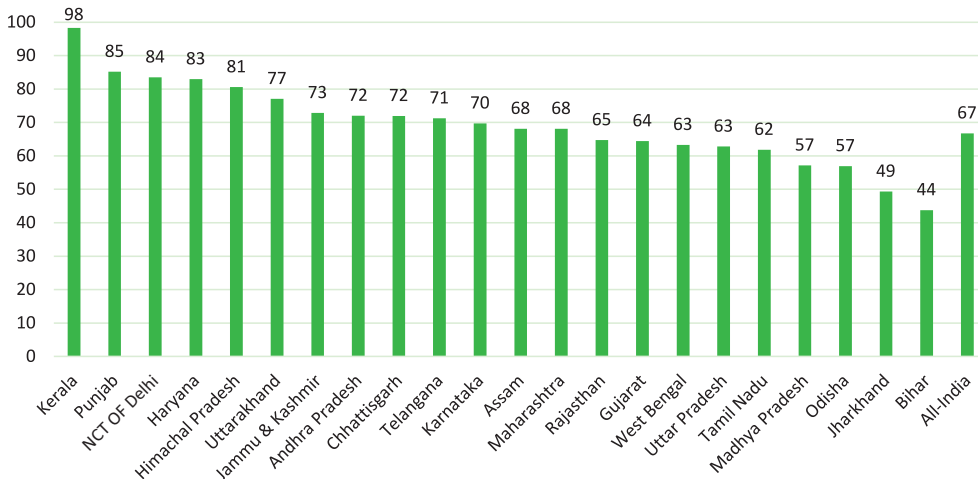
#### 4.1.5 Access to Improved Toilet Facility<sup>4</sup> (Rural)

Sanitation status, analysed here in terms of access to an improved toilet facility, is again poor in Jharkhand. As per NFHS-5, less than half of the households in

rural areas have access to an improved toilet facility, which is 18 percentage points less than the national average (Figure 4.1). Inadequate integration of public interventions in water and sanitation with public health programmes shows a failure which has a negative consequence on health attainment. A close integration to provision of toilet through different programmes with the changing behaviour is necessary. Studies done across rural Bihar, Madhya Pradesh, Rajasthan, and Uttar Pradesh show that among households having functional toilet, 40 per cent households have members who still defecate in the open (Gupta et al. 2019). The reason for open defecation despite availability of toilet are traditional mindsets wherein households perceived open defecation as healthier (Gupta et al. 2019). Studies show that a majority of households who do not have access to toilet in rural areas belong to poorer economic category (Mehta 2013).

Map 4.5 clearly shows that access to improved toilet is extremely low in Jharkhand and there is a high inter-district inequality. Only 49 per cent of households have access to improved toilet facility in rural Jharkhand. The districts showing highest percentage are Ranchi (71 per cent), Simdega (70 per cent), and Lohardaga (64

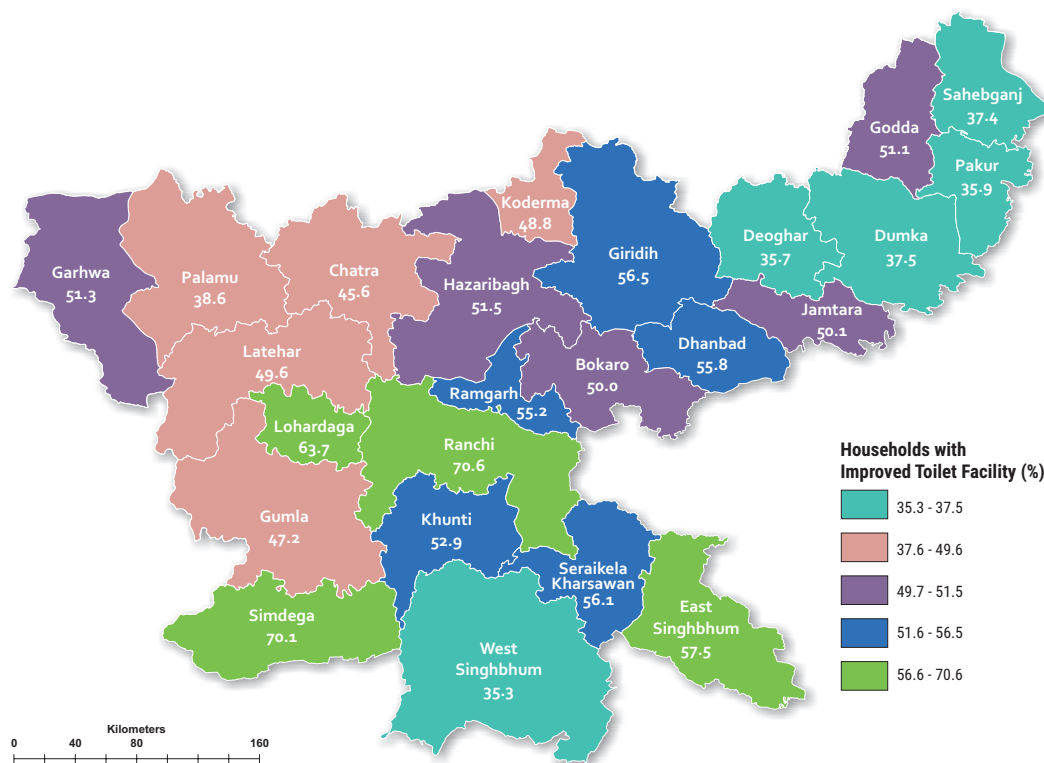
**Figure 4.1: Percentage of Households with Improved Toilet Facility in Rural Areas of Major States, 2019-2021**



Source: NFHS 5, 2019-2021.

4. As per NFHS-5, improved toilet facility includes any non-shared toilet of the following types: flush/pour flush toilets to piped sewer systems, septic tanks, pit latrines, or an unknown destination; ventilated improved pit (VIP)/biogas latrines; pit latrines with slabs; and twin pit/composting toilets.

**Map 4.5: District-wise Percentage of Households with an Improved Toilet Facility in Rural Jharkhand, 2019-2021**



Source: Computed and prepared by IHD Research team based on NFHS-5, 2019-2021.

per cent). Districts in the lower ladder are Pashchimi Singhbhum (35 per cent), Deoghar (36 per cent), and Pakur (36 per cent).

#### 4.2 Status of Districts in Food Utilisation Index

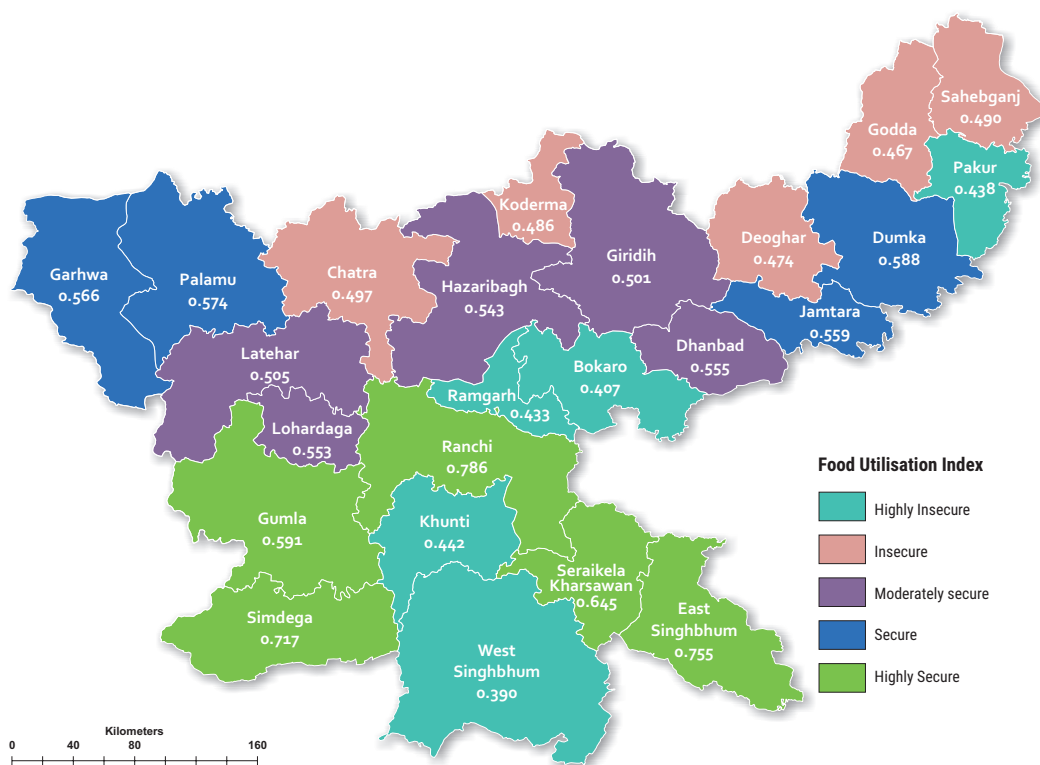
Based on the five indicators described earlier, it emerges that Ranchi, Purbi Singhbhum, Simdega, Saraikela-Kharsawan, and Gumla emerged as the most food secure in terms of utilisation or absorption of food. On the other hand, districts of Khunti, Pakur, Ramgarh, Bokaro, and Pashchimi Singhbhum are found to be highly insecure in terms of Food Utilisation Index of rural Jharkhand.

In terms of availability of rural health institutions, among the highly secure districts, all the five districts have more than 20 PHCs per lakh population. Ranchi has the highest percentage of households with access to improved toilet facility and the highest rural female literacy and also the lowest prevalence of disease in

terms of diarrhoea among children. Purbi Singhbhum has the lowest prevalence of disease and is among the highest percentages of households with access to improved toilet facility and availability of rural health institutions. Simdega has the highest rural female literacy and availability of rural health institutions and second highest percentages of households with access to improved toilet facility.

On the other hand, the highly insecure district of Khunti, in terms of food utilisation, is among the lowest percentages of households with access to safe drinking water and the highest prevalence of disease. Pakur is among the lowest rural female literacy rates and lowest percentages of households with access to improved toilet facility. Ramgarh, which is an otherwise developed district, is also among the highly food insecure district in terms of food utilisation as it is among the lowest percentages of households with access to safe drinking water.

**Map 4.6: District-wise Food Utilisation Index of Rural Jharkhand**



Source: Computed and prepared by IHD Research team.

**Table 4.2: Indicators Used to Compute Food Utilisation Index of Rural Jharkhand**

District	Percentage of Household with Access to Safe Drinking Water		Number of PHC/CHC per lakh Population		Female Literacy Rate		Disease and Health Behaviour (100-Prevalence of Diarrhoea (reported) in the Last 2 Weeks Preceding the Survey (%))		Percentage of Household with Access to Improved Toilet	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Bokaro	80.0	16	12	17	62.5	6	83.5	24	50.0	14
Chatra	82.4	13	9	22	59.5	17	95.5	6	45.6	18
Deoghar	90.3	5	13	14	57.2	20	93.2	11	35.7	23
Dhanbad	81.4	14	16	10	61.2	10	89.7	20	55.8	7
Dumka	92.8	2	21	7	58.6	18	93.5	9	37.5	20
Purbi Singhbhum	83.8	11	24	3	60.5	13	98.0	1	57.5	4
Garhwa	91.6	4	9	21	59.8	16	93.1	12	51.3	11
Giridih	86.3	8	8	23	58.5	19	91.0	17	56.5	5
Godda	88.5	6	13	15	51.1	24	92.9	13	51.1	12
Gumla	70.7	21	23	5	63.3	4	95.4	7	47.2	17
Hazaribagh	84.2	10	10	20	64.0	3	90.7	19	51.5	10
Jamtara	92.3	3	18	9	60.5	14	86.7	23	50.1	13

Contd...

District	Percentage of Household with Access to Safe Drinking Water		Number of PHC/CHC per lakh Population		Female Literacy Rate		Disease and Health Behaviour (100-Prevalence of Diarrhoea (reported) in the Last 2 Weeks Preceding the Survey (%))		Percentage of Household with Access to Improved Toilet	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Khunti	67.1	22	21	6	60.9	11	87.5	22	52.9	9
Kodarma	80.6	15	10	19	62.1	7	91.1	16	48.8	16
Latehar	78.2	17	13	13	59.9	15	93.3	10	49.6	15
Lohardaga	75.8	20	4	24	62.8	5	95.7	4	63.7	3
Pakur	88.4	7	14	12	52.6	23	95.5	5	35.9	22
Palamu	93.6	1	10	18	61.7	9	95.3	8	38.6	19
Ramgarh	66.7	23	12	16	61.7	8	90.7	18	55.2	8
Ranchi	77.4	18	20	8	66.0	2	96.0	3	70.6	1
Sahibganj	86.3	9	14	11	55.8	21	96.8	2	37.4	21
Saraikela-Kharsawan	83.5	12	23	4	60.8	12	91.4	15	56.1	6
Simdega	65.2	24	27	1	66.8	1	92.2	14	70.1	2
Pashchimi Singhbhum	76.9	19	24	2	55.5	22	88.9	21	35.3	24
Total	83.6		15		59.9		92.4		51.0	

Source: Computed by IHD Research team.

However, while analysing the basic indicators one has to keep other factors in mind and hence analyse cautiously. The very existence of a well, tube-well or a tap does not imply that they are functioning, or if they are, that the quality of water is good. Similarly, the availability of a PHC does not mean that the doctors and other staff visit them regularly and the physical

instruments are available in the institutions. High levels of malnutrition and child deaths from these regions coupled with high incidence of vector diseases are a pointer towards poor drinking water and health facilities in these villages. Secondary data is unable to reflect this reality. It, therefore, calls for further in-depth investigation and a contextualisation of terms.

**Table 4.3: Status of District in terms of Food Utilisation Index of Rural Jharkhand**

Highly Secure	Secure	Moderately Secure	Insecure	Highly Insecure
Ranchi	Dumka	Lohardaga	Chatra	Khunti
Purbi Singhbhum	Palamu	Hazaribagh	Sahibganj	Pakur
Simdega	Garhwa	Latehar	Kodarma	Ramgarh
Saraikela-Kharsawan	Jamtara	Giridih	Deoghar	Bokaro
Gumla	Dhanbad		Godda	Pashchimi Singhbhum

Source: Computed by IHD Research team.

# FOOD SECURITY OUTCOME IN RURAL JHARKHAND

The outcome of food security can be considered as the nutritional status of the individual, with the understanding that food intake is the basic, though not the only factor, that affects nutritional status. In developing countries, the rural population, particularly children, are vulnerable to malnutrition because of low dietary intake, lack of appropriate care, and inequitable distribution of food within the household.

## 5.1 Dimensions and Indicators of Food Security Outcome

For the Food Security Outcome (FSO) Index, we have taken three major variables:

1. Children under 5 years, who are underweight (weight-for-age) (%).
2. Women whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m<sup>2</sup>) (%).
3. Children age 6-59 months, who are anaemic (<11.0 g/dl) (%).

In the next sections, importance of each indicator and the link of these indicators with food security have been discussed.

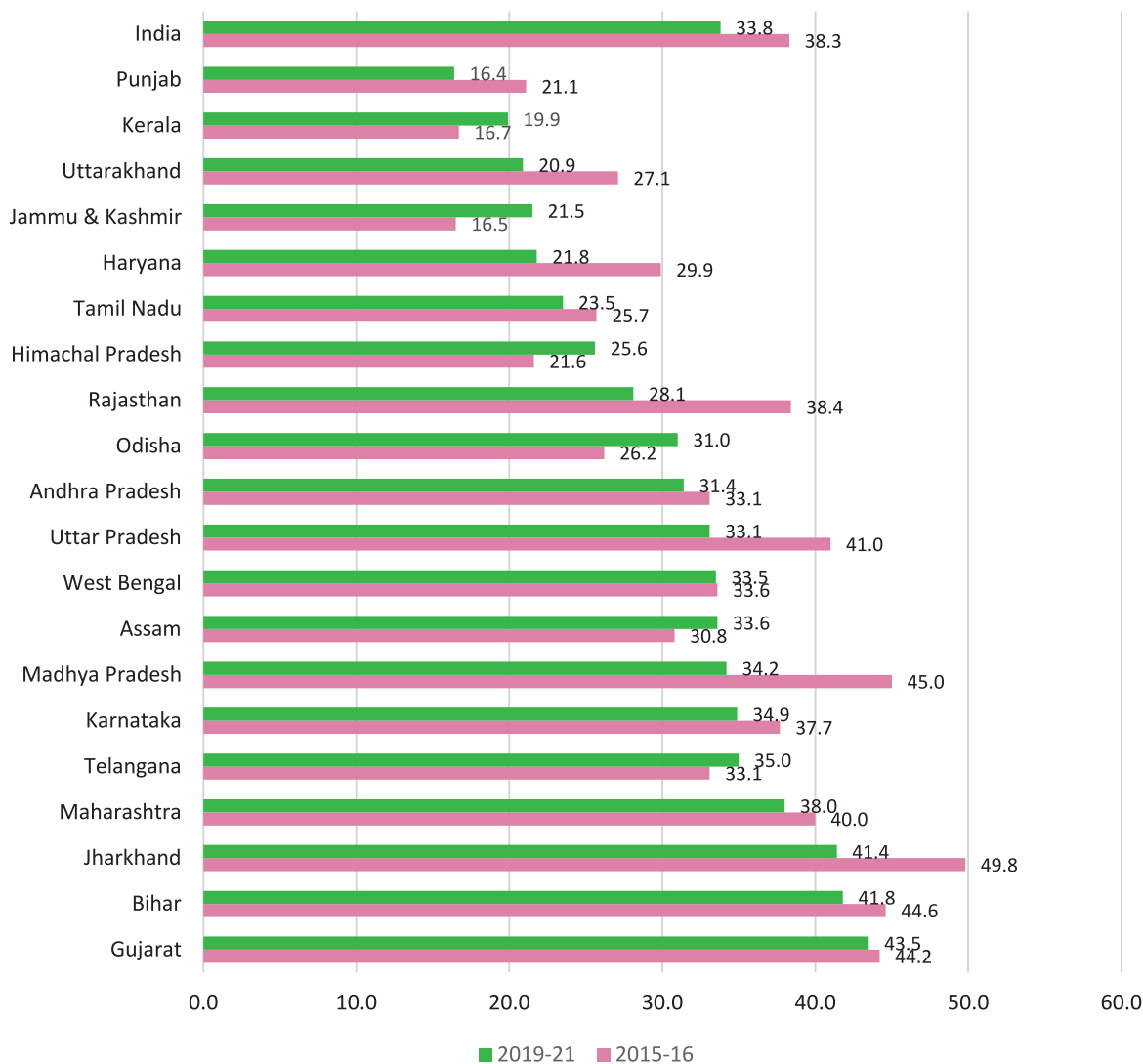
### 5.1.1 Children Under 5 Years who are Underweight (Weight-For-Age) (Rural)

Household food insecurity is associated with severe health and nutritional outcome (Gundersen et al. 2009, Abdu et al. 2018). Children who are more than two standard deviations below the reference median

on the index of weight-for-age are considered to be 'underweight'. We have opted for percentage of underweight children as the indicator for capturing malnutrition among children. The primary reason being that weight-for-age is a composite measure that takes into account both chronic and acute under-nutrition. Food insecurity increases the risk of underweight. The risk of underweight and stunting is augmented by intensification of food insecurity in food insecure households (Moradi et al. 2019). Maternal underweight is also associated with food insecurity (Abdu et al. 2018). Studies have found that incidence of underweight was 48 per cent higher among women belonging to households with moderate hunger and more than 2 times higher for women belonging to severe hunger compared to households that were food secure or insecure without hunger (Isanaka et al. 2007). Women's nutrition affects a wide range of social issues, including family care and household food security (FMoH/UNICEF/EU 2016). Household food insecurity was also associated with the nutritional status of children under 5 years (Ali Naser et al. 2014; Saha et al. 2009; Isanaka et al. 2007; Hasan et al. 2013; Motbainor et al. 2015). Therefore, we have selected percentage of children below age 5 by underweight status for measuring food insecurity outcome status.

Figure 5.1 shows that in Jharkhand (41.4 per cent), a high percentage of children are found to be underweight. More than one-third of the total districts in Jharkhand have high percentage of underweight children. In terms of lowest percentage of underweight

**Figure 5.1: Percentage of Children Under 5 Years who are Underweight in Rural Areas of Major States, 2015-16 and 2019-2021**

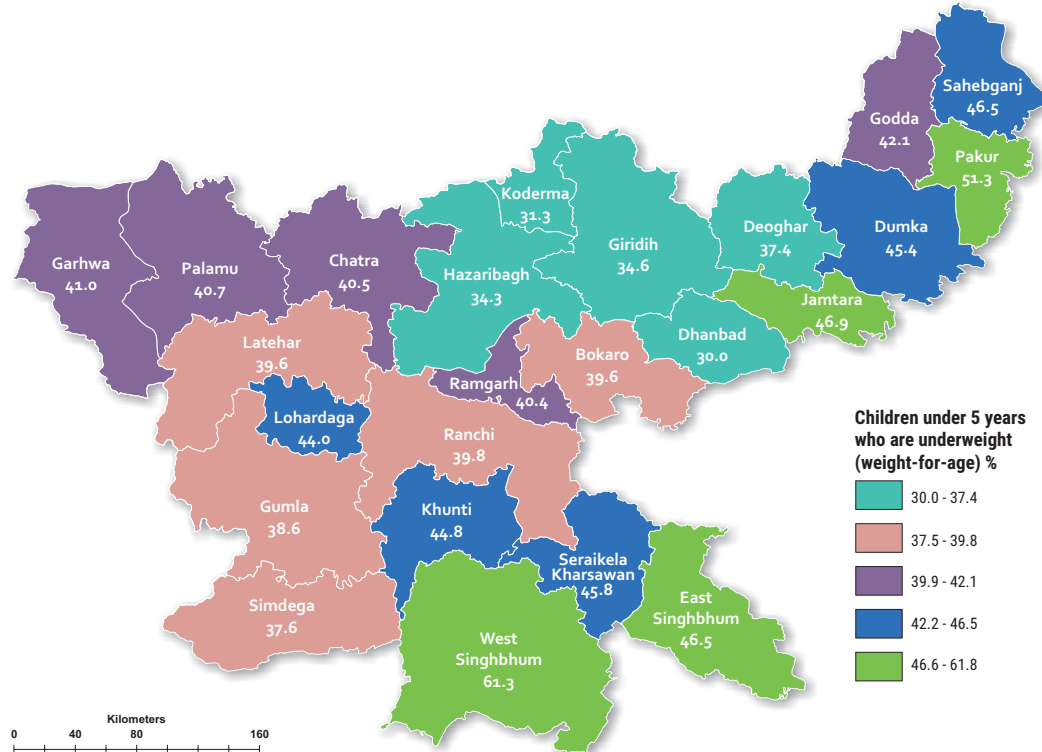


Source: NFHS-4 (2015-16) and NFHS-5 (2019-2021).

children, Punjab and Kerala top the list. Jharkhand has the third highest percentage of underweight children among the major states next to the states of Gujarat (43.5 per cent) and Bihar (41.8 per cent). In Jharkhand, the percentage of underweight children reduced to 41.4 per cent in 2019-2021 from 49.9 per cent in 2015-16. No doubt the percentage has reduced between the two periods, but the current status of percentage of underweight children is still one of the highest in the country. The prevalence of underweight children in Jharkhand is 7 percentage points higher as compared to all-India average, and it is more than double as

compared to the prevalence of underweight children in rural Punjab and Kerala. Map 5.1 shows the status of districts of Jharkhand with regards to underweight children in 2019-2021.

Districts registering highest percentage of underweight children are Pashchimi Singhbhum (62 per cent), Pakur (51.3 per cent), Jamtara (46.9 per cent), and Purbi Singhbhum (46.5 per cent). On the other hand, districts registering lowest prevalence are Dhanbad (30 per cent), Kodarma (31 per cent), Hazaribagh (34.3 per cent), and Giridih (34.6 per cent). Pashchimi Singhbhum district, which has the

**Map 5.1: District-wise Percentage of Children Under 5 Years who are Underweight (Weight-For-Age) in Rural Jharkhand, 2019-2021**

Source: Computed and prepared by IHD Research team based on NFHS-5, 2019-2021.

highest prevalence of underweight children, also recorded among the highest prevalence of diarrhoea among children under age 5 years in its rural areas. It shows a 32 percentage points higher prevalence as compared to Dhanbad district having the lowest prevalence. Then the disparity at the district level is quite wide.

### 5.1.2 Women whose Body Mass Index (BMI) is Below Normal (Rural)

Body Mass Index (BMI) and food security has a strong linkage. A BMI below 18.5 kg/m<sup>2</sup> among non-pregnant, non-lactating women indicates chronic energy deficiency or undernutrition. When BMI is above 25, women are considered overweight. Research studies show a clear link between low BMI and low dietary intake. Hence, low BMI is an indicator of food insecurity (Ramachandran 2013). Among severely food insecure households, 27 per cent of married women had BMI below 18.5 kg/m<sup>2</sup> compared with only 13 per cent of women from food-secure households (Singh

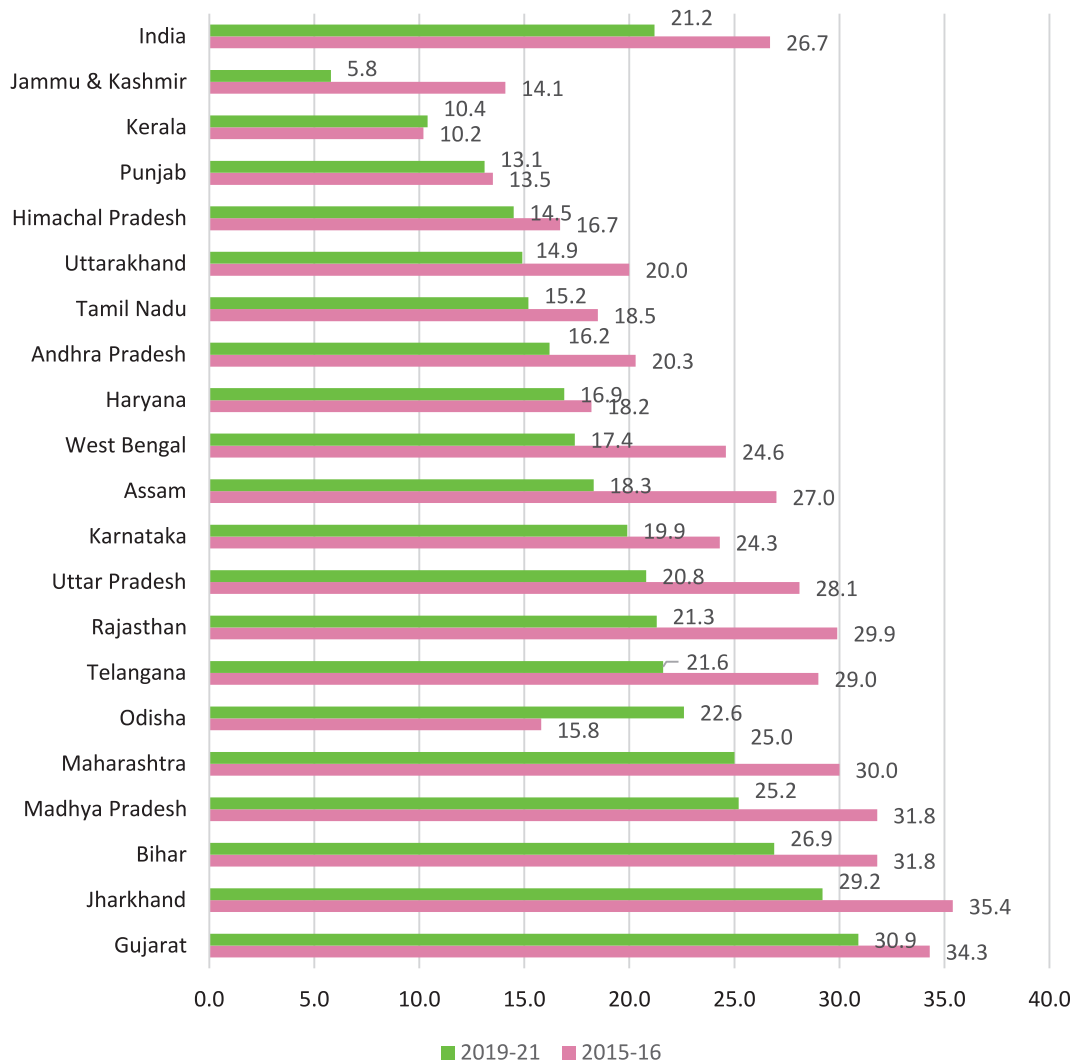
& Ram 2014). Women from severely food-insecure households were 1.5 times as likely as women from food-secure households to have a BMI below 18.5 kg/m<sup>2</sup> (Singh & Ram 2014).

Figure 5.2 shows the percentage of women whose BMI is below normal (BMI < 18.5 kg/m<sup>2</sup>) or thin women in rural areas of major states. The findings show that the percentage of women in Jharkhand having low BMI in 2019-2021 is 29.2 per cent which has reduced from 35.4 per cent in 2015-16. Jharkhand has the second highest percentage of thin women next to Gujarat (31 per cent). The percentage of thin women was 8 percentage points higher compared to all-India. Jammu & Kashmir, Kerala and Punjab registered the lowest percentage of thin women. The percentage of thin women in Jammu & Kashmir is about one sixth of the prevalence in Jharkhand.

Map 5.2 shows the percentage of thin women at district level in rural Jharkhand in 2019-2021. The district registering the highest percentage of thin



**Figure 5.2: Percentage of Women whose BMI is Below Normal (BMI < 18.5 kg/m<sup>2</sup>) in Rural Areas of Major States, 2015-16 and 2019-2021**



Source: NFHS-4 (2015-16) and NFHS-5 (2019-2021).

women was Pakur (36 per cent) followed by Deoghar (35.4 per cent), Bokaro (35 per cent), and Pashchimi Singhbhum (34 per cent). On the other hand, the districts which registered the lowest percentage of thin women were Khunti (22 per cent), Ranchi (23 per cent), Purbi Singhbhum (24 per cent), and Saraikela-Kharsawan (24 per cent).

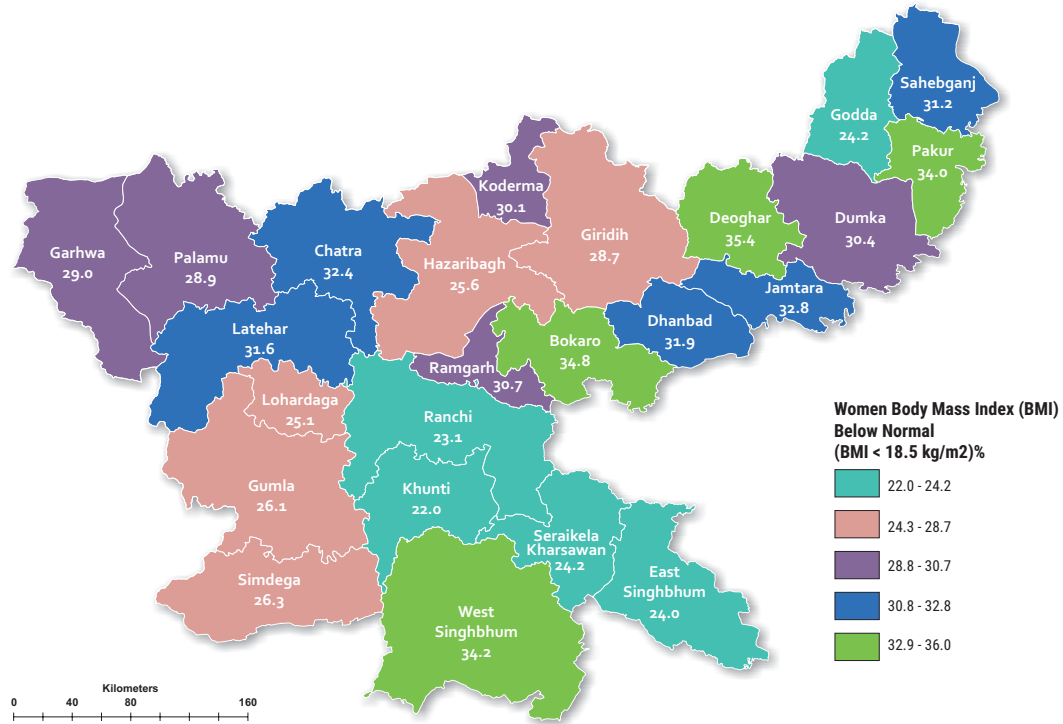
### 5.1.3 Children Age 6-59 Months who are Anaemic (<11.0 g/dl) (Rural)

Anaemia is one of the outcome indicators taken for comparison and validates with the food security index. It has been well-researched and found out by

many researchers that there is a close link between the anaemia level and food security of households. Anaemia is also reported to be the most prevalent nutritional deficiency that affects pregnancy outcome and threatens life of both the mother and the foetus (Osion 2010). Household food insecurity has a depressing impact on food consumption and eventually it has an adverse impact on health (Miller et al. 2009). There will be less chances of iron deficiency and anaemia when households are in better living condition (Zang et al. 2008).

It has also been found out that women who reported food insecurity were about 1.6 times more



**Map 5.2: District-wise Percentage of Women whose BMI is Below Normal (BMI < 18.5 kg/m<sup>2</sup>) in Rural Jharkhand, 2019-2021**

Source: Computed and prepared by IHD Research team based on NFHS-5, 2019-2021.

likely to suffer from anaemia as compared to their food secure counterparts. The relation between food security and anaemia is also pronounced among women of reproductive age and especially pregnant women (School 2005). A study among women in Bangladesh found that apart from high burden of anaemia, they also suffer from under-nutrition (Ahmed et al. 2012).

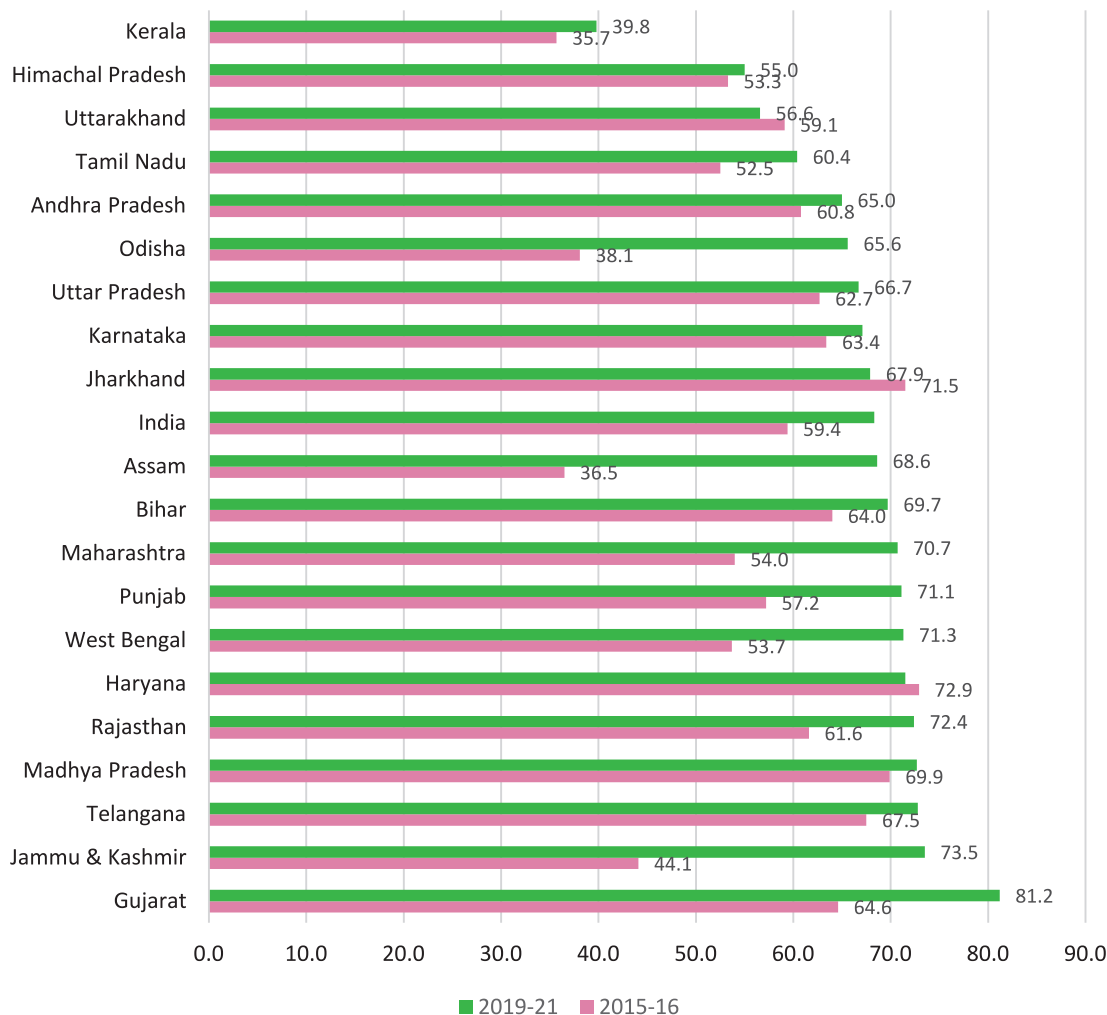
Here, for FSO Index, we have taken anaemia among children age 6-59 months. Figure 5.3 shows the status of anaemia among children in the age group 6-59 months in major states at two time periods in rural areas. The states showing a higher degree of anaemia among children are Gujarat, Jammu & Kashmir and Telangana, whereas states showing the lowest percentage were Kerala, Himachal Pradesh and Uttarakhand in the year 2019-2021. In Jharkhand, 68 per cent of children are anaemic as of 2019-2021 which has reduced by only 3 percentage points as compared to 2015-16.

Map 5.3 shows the percentage of anaemic children at the district level in rural Jharkhand in the year 2019-2021. The districts with the highest percentage of anaemic children are Saraikela-Kharsawan (80 per cent), Dumka (78 per cent), Simdega (77.5 per cent) and Deoghar (77 per cent), which have more than three-fourth of the children age 6-59 months as anaemic. On the other hand, the districts showing the lowest percentage were Koderma (58 per cent), Hazaribagh (63 per cent), and Chatra (63 per cent), and Ranchi (63 per cent). Almost all the districts of the Santhal Pargana division have very high percentage of anaemic children i.e., above 75 per cent.

## 5.2 Status of Districts in Food Security Outcome Index

The FSO Index has been arrived at by adding the average of all three indicators. Tables 5.1 and 5.2 indicate the status of the districts in terms of the outcome indicators and FSO Index. The FSO Index computed through Range Equalization Method (REM)

**Figure 5.3: Percentage of Children Age 6-59 Months who are Anaemic (<11.0 g/dl) in Rural Areas of Major States, 2015-16 and 2019-2021**



Source: NFHS 4 (2015-16) and NFHS 5 (2019-2021).

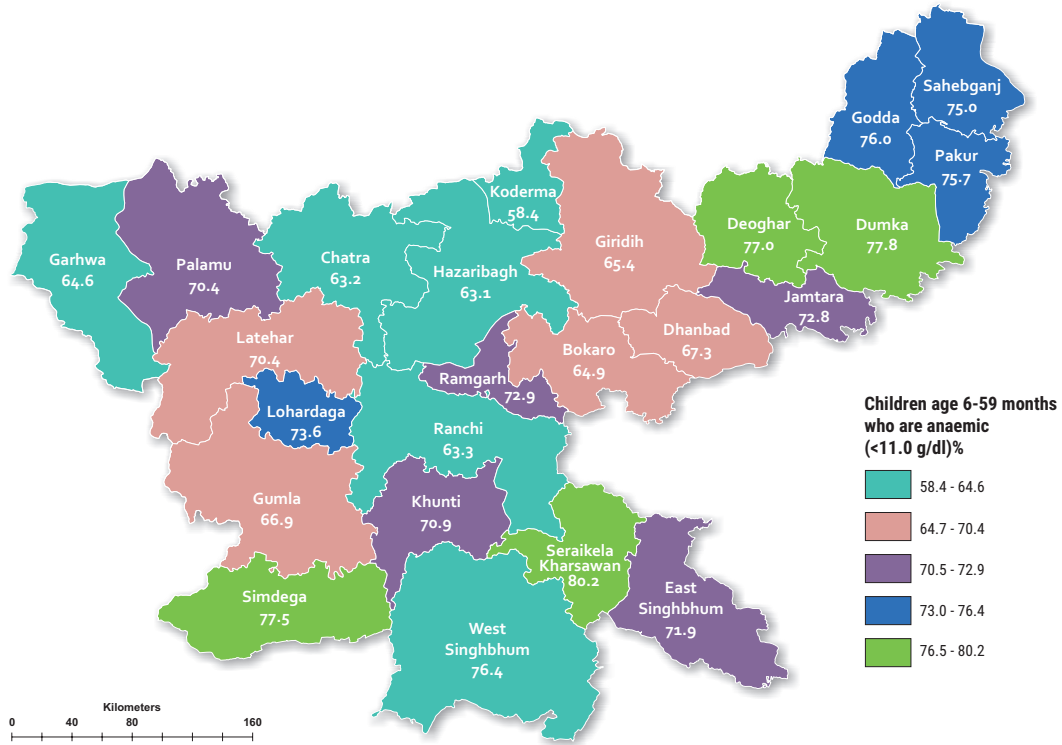
is shown in Map 5.4. Based on the three component indicators, districts of Hazaribagh, Ranchi, Kodarma, Giridih, and Gumla emerged as highly secure in terms of outcome of food security. On the other hand, districts of Jamtara, Dumka, Deoghar, Pakur, and Pashchimi Singhbhum are found to be highly insecure in terms of Food Security Outcome Index of rural Jharkhand (Map 5.4).

Almost all the districts of the Santhal Pargana division are insecure or highly insecure in terms of outcome of food security owing to very high percentage of anaemic as well as underweight children. Jamtara district has the highest percentage

of underweight children while Dumka has the second highest percentage of anaemic children. Deoghar has the highest percentage of women whose BMI is below normal as well as anaemic children. On the other end of the spectrum, Ranchi district has the second lowest percentage of thin women while Hazaribagh has the second lowest percentage of anaemic as well as underweight children. Koderma has the lowest percentage of children age 6-59 months who are anaemic.

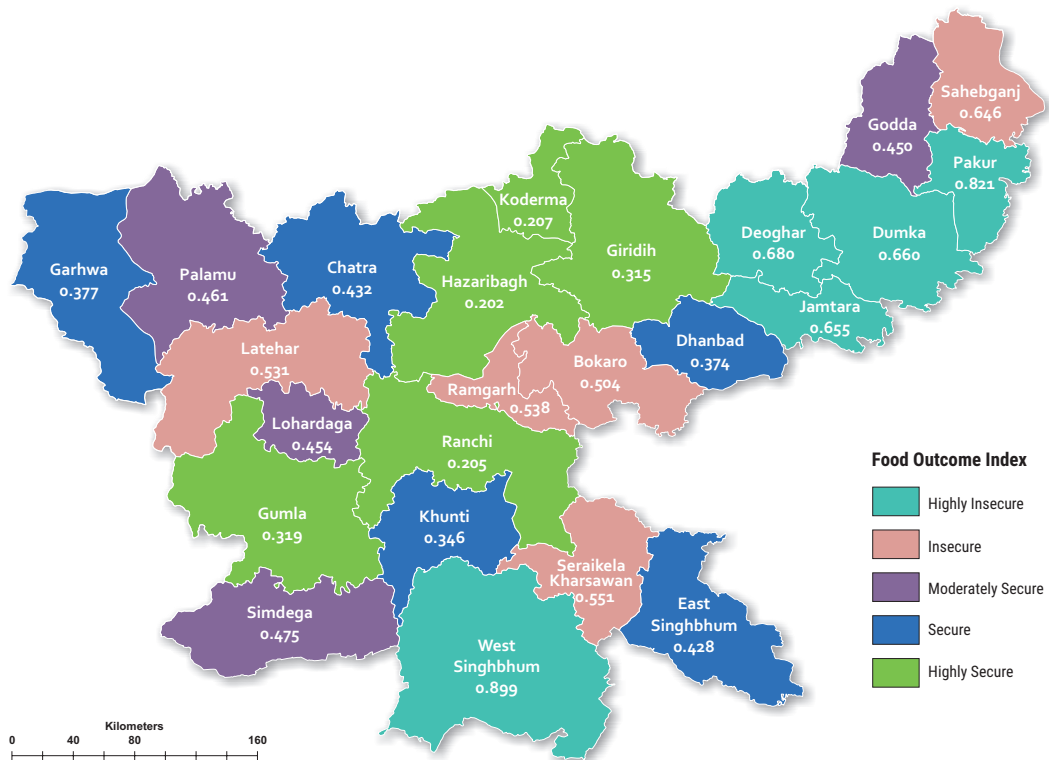
The results underline the fact that children in Jharkhand are at substantially higher risk of chronic and current malnutrition, and child malnutrition

**Map 5.3: District-wise Percentage of Children Age 6-59 Months who are Anaemic (<11.0 g/dl) in Rural Jharkhand, 2019-2021**



Source: Computed and prepared by IHD Research team based on NFHS-5, 2019-2021.

**Map 5.4: District-wise Food Security Outcome Index of Rural Jharkhand**



Source: Computed and prepared by IHD Research team.

**Table 5.1: Indicators Used to Compute Food Security Outcome Index of Rural Jharkhand**

District	Children under 5 years who are underweight (weight-for-age) (%) NFHS-5		Women whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m <sup>2</sup> ) (%) NFHS-5		Children age 6-59 months who are anaemic (<11.0 g/dl) (%) NFHS-5		Outcome Index	
	Value	Rank	Value	Rank	Value	Rank	Index	Rank
Bokaro	39.6	9	34.8	22	64.9	6	0.504	15
Chatra	40.5	12	32.4	19	63.2	3	0.432	10
Deoghar	37.4	5	35.4	23	77.0	21	0.680	22
Dhanbad	30.0	1	31.9	18	67.3	9	0.374	7
Dumka	45.4	18	30.4	14	77.8	23	0.660	21
East Singhbhum	46.5	21	24.0	3	71.9	13	0.428	9
Garhwa	41.0	14	29.0	12	64.6	5	0.377	8
Giridih	34.6	4	28.7	10	65.4	7	0.315	4
Godda	42.1	15	24.2	5	76.0	19	0.450	11
Gumla	38.6	7	26.1	8	66.9	8	0.319	5
Hazaribagh	34.3	3	25.6	7	63.1	2	0.202	1
Jamtara	46.9	22	32.8	20	72.8	14	0.655	20
Khunti	44.8	17	22.0	1	70.9	12	0.346	6
Kodarma	31.3	2	30.1	13	58.4	1	0.207	3
Latehar	39.6	8	31.6	17	70.4	10	0.513	16
Lohardaga	44.0	16	25.1	6	73.6	16	0.454	12
Pakur	51.3	23	36.0	24	75.7	18	0.821	23
Palamu	40.7	13	28.9	11	70.4	11	0.461	13
Ramgarh	40.4	11	30.7	15	72.9	15	0.538	17
Ranchi	39.8	10	23.1	2	63.3	4	0.205	2
Sahibganj	46.5	20	31.2	16	75.0	17	0.646	19
Saraikela-Kharsawan	45.8	19	24.2	4	80.2	24	0.551	18
Simdega	37.6	6	26.3	9	77.5	22	0.475	14
West Singhbhum	61.8	24	34.2	21	76.4	20	0.899	24
Jharkhand	41.4	#N/A	29.1		70.1			

Source: Computed by IHD Research team.

**Table 5.2: Status of Districts in Terms of Food Security Outcome Index of Rural Jharkhand**

Highly Secure	Secure	Moderately Secure	Insecure	Highly insecure
Hazaribagh	Khunti	Godda	Bokaro	Jamtara
Ranchi	Dhanbad	Lohardaga	Latehar	Dumka
Kodarma	Garhwa	Palamu	Ramgarh	Deoghar
Giridih	Purbi Singhbhum	Simdega	Saraikela-Kharsawan	Pakur
Gumla	Chatra		Sahibganj	Pashchimi Singhbhum

Source: Computed by IHD Research team.

is almost a universal challenge across the state of Jharkhand with certain pockets of severe malnutrition. Nearly 40 per cent of children under the age of five in Jharkhand suffered from chronic malnutrition (stunting), approximately 39 per cent were underweight, and 22 per cent suffered from wasting as of 2019-2021 (NFHS-5). The prevalence of such levels of food insecurity and malnutrition is a stern reminder

that the various government-sponsored measures to alleviate food deficiency in the poverty-ridden pockets of the region have not desirably reached the targeted population. To be nutrition secure, all people should be free from chronic malnutrition and diseases so that the human body can absorb and utilise the food more effectively.



## ADDRESSING FOOD SECURITY IN RURAL JHARKHAND

The preceding chapters have analysed the three dimensions of food security index i.e., availability, access, utilisation, as well as food security outcome. In this chapter, the three-dimensional indices, overall food security index, Food Security Outcome (FSO) Index and the related factors have all been taken together to analyse the food security situation across the districts of rural Jharkhand. Table 6.1 shows the status of the districts in terms of the Food Security Index (FSI). In this chapter, we have analysed the overlap between FSI and FSO among different districts. We have explained the interlinkages between the dimensions, FSI and FSO. As can be seen, the factors or indicators that have been included in the composite FSI do indeed contribute to food insecurity, and therefore, any strategy to improve the food security status must address these factors. Besides, this chapter also identifies the policy variables which have been worked out through Principal Component Analysis (PCA) that determine the strategy variable for an effective implementation.

### 6.1 Status of Districts in Food Security Index

The FSI is a composite index covering three dimensions, i.e., availability, access, and utilisation factors. Districts having higher index value are considered relatively more food secure compared to districts with lower index values. All variables included in the index are for rural areas, unless otherwise specified. In the analysis, we have also explained the public entitlement which

is an important factor explaining the FSI and FSO. However, public entitlement has not been used as a dimension either in FSI or FSO. The reason behind not including this as an index is that the FSI and entitlement index may not have a positive relation. For example, public intervention/entitlement may extensively be implemented in the district having low FSI.

For each of the dimensions, as discussed earlier, some relevant variables have been chosen. All indicators used to calculate the composite index should be positively related to the index. In order to do that, some of the variables have been reversed. The indicators, source of information and the reference year have been detailed in Table 1.10 in chapter 1.

Ranking district-level FSI for Jharkhand on the basis of averaging index value of the three dimensions reveal that Purbi Singhbhum, Ranchi, Dhanbad, Hazaribagh, and Ramgarh districts are highly food secure districts whereas Jamtara, Garhwa, Pakur, Sahibganj, and Godda are found to be the most food insecure. Purbi Singhbhum and Ranchi, which are highly industrialised and urbanised districts, have emerged as the most food secure among all the 24 districts of Jharkhand owing to their second position and first position respectively in Food Availability Index and Food Utilisation Index. Dhanbad, again one of the industrially advanced and the most urbanised district, is placed at the third position in FSI as it occupies the second and third position respectively

**Table 6.1: Ranks of Districts on Composite Food Security Index and its Components**

District	Availability		Access		Utilisation		FSI		FSO	
	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank
Bokaro	0.422	7	0.640	8	0.407	23	0.490	14	0.504	15
Chatra	0.254	19	0.506	19	0.497	15	0.420	18	0.432	10
Deoghar	0.304	16	0.615	10	0.474	18	0.470	16	0.680	22
Dhanbad	0.549	3	0.746	2	0.555	10	0.617	3	0.374	7
Dumka	0.314	14	0.553	16	0.588	6	0.481	15	0.660	21
Purbi Singhbhum	0.595	2	0.652	7	0.755	2	0.664	1	0.428	9
Garhwa	0.196	22	0.378	23	0.566	8	0.382	21	0.377	8
Giridih	0.276	17	0.690	5	0.501	14	0.490	13	0.315	4
Godda	0.190	23	0.394	22	0.467	19	0.346	24	0.450	11
Gumla	0.387	8	0.628	9	0.591	5	0.532	6	0.319	5
Hazaribagh	0.435	5	0.692	4	0.543	12	0.558	4	0.202	1
Jamtara	0.119	24	0.556	15	0.559	9	0.412	20	0.655	20
Khunti	0.318	13	0.595	11	0.442	20	0.448	17	0.346	6
Kodarma	0.375	9	0.694	3	0.486	17	0.527	7	0.207	3
Latehar	0.441	4	0.576	14	0.505	13	0.500	11	0.513	16
Lohardaga	0.368	10	0.586	13	0.553	11	0.509	9	0.454	12
Pakur	0.209	21	0.498	20	0.438	21	0.382	22	0.821	23
Palamu	0.423	6	0.525	18	0.574	7	0.507	10	0.461	13
Ramgarh	0.337	11	0.830	1	0.433	22	0.544	5	0.538	17
Ranchi	0.609	1	0.593	12	0.786	1	0.663	2	0.205	2
Sahibganj	0.276	18	0.319	24	0.490	16	0.371	23	0.646	19
Saraike-la-Kharsawan	0.236	20	0.682	6	0.645	4	0.517	8	0.551	18
Simdega	0.313	15	0.469	21	0.717	3	0.496	12	0.475	14
Pashchimi Singhbhum	0.329	12	0.531	17	0.390	24	0.418	19	0.899	24

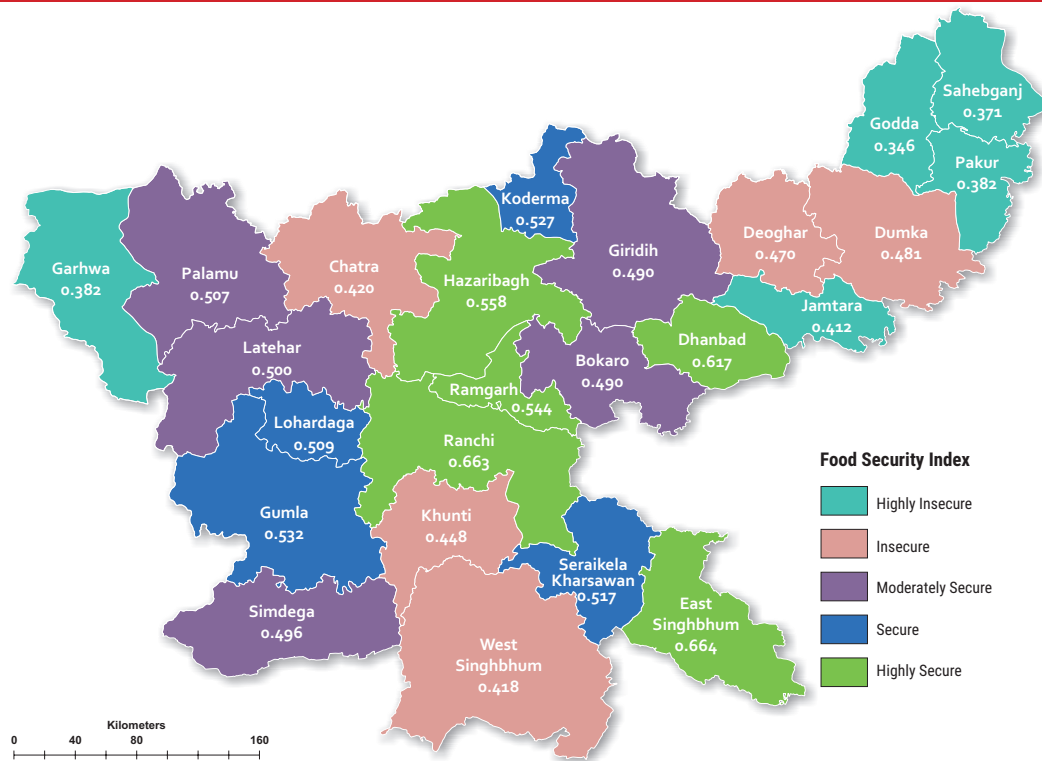
Source: Computed by IHD Research team.

**Table 6.2: Status of Districts in Terms of Food Security Index of Rural Jharkhand**

Highly Secure	Secure	Moderately Secure	Insecure	Highly Insecure
Purbi Singhbhum	Gumla	Latehar	Dumka	Jamtara
Ranchi	Kodarma	Simdega	Deoghar	Garhwa
Dhanbad	Saraike-la-Kharsawan	Giridih	Khunti	Pakur
Hazaribagh	Lohardaga	Bokaro	Chatra	Sahibganj
Ramgarh	Palamu		Pashchimi Singhbhum	Godda

Source: Computed by IHD Research team.



**Map 6.1: District-wise Food Security Index of Rural Jharkhand**

Source: Computed and prepared by IHD Research team.

in Access to Food Index and Food Availability Index. Similarly, Ramgarh, yet another industrialised and urbanised district, occupied the fifth position in terms of being most food secure district owing to it being placed at the first position in Access to Food Index.

On the other hand, Godda, Sahibganj, and Pakur districts in the Santhal Pargana region collectively form the zone of high food insecurity. Godda district is the most food insecure district and is placed at the last position in FSI. This district is placed at the third lowest position in terms of Access to Food Index and second lowest in Food Availability Index. Sahibganj, which is among the most insecure group of districts, recorded the lowest Access to Food. Pakur, which is one of the five most insecure FSI districts, is ranked fourth lowest in Food Availability Index and Food Utilisation Index.

Principal Component Analysis was used to compute the district level index as well as to identify the key determinant variables which are crucial for policy purpose.

## 6.2 Identifying the Priority Indicators

In analysing the FSI, we have used 15 variables in three dimensions i.e., availability, access, and utilisation. The PCA technique is applied to identify the priority variables which is important in explaining the food insecurity/security among districts. The variables are given in Figure 6.1 and Table 6.3 shows the most important indicators that explain FNS.

The findings reveal that Per Capita Value of Agricultural Output in terms of cereal crops in the rural areas is one of the most important indicators that determined the food and nutrition security (FNS) status of the districts. The second important indicator or policy variable for FNS is the percentage of workers other than agricultural labourers. The reason is that there is higher disguised unemployment. If the agricultural labour shifted from agricultural sector to non-agricultural sector without reducing the productivity, this would indicate a higher food security status. Again, the processing of agricultural products will be high if there is a higher scope of non-agricultural employment in rural areas.

**Table 6.3: Eigen Vectors**

Variable	Component
Per Capita Value of Agricultural Output (Cereal)	0.744
Other than Agricultural Labourers to All Workers	0.715
Female Literacy Rate	0.664
Number of PHC/CHC per Lakh Population	0.659
Percentage of Household with Access to Improved Toilet	0.607
Urbanisation Rate	0.482
Average Per Capita Consumption Expenditure	0.391
Percentage of Village Access to Paved Road	0.324
Rainfall Variability (100-CV of Annual)	-0.068
Casual Wage	-0.252
Disease and Health Behaviour	-0.307
Net Irrigated Area to Net Sown Area	-0.504
Percentage Non-SC & ST Population	-0.521
Non-Dependency Ratio	-0.521
Percentage Household Access to Safe Drinking Water	-0.748

**Note:** Extraction Method–Principal Component Analysis.

**Source:** Computed by IHD Research team.

The third important factor determining FNS is female literacy rate. This is an important determinant because as discussed in the previous chapters more aware the mother is, better will be the decision making and care practices as well as involvement in job market. This directly or indirectly ensures more food security among household. This is followed by availability of health institutions in the locality as the next in rank of importance. It shows that higher the access to Primary Health Centres (PHCs)/Community Health Centres (CHCs), higher will be the food security of the household. The access to improved toilet and

urbanisation are the other determining factors. Higher the level of urbanisation, higher will be the access to basic services, marketing and farmers can more easily access different agricultural inputs.

Based on the factor loadings, the above-mentioned variables are identified as priority variables which need further intervention in food insecure areas/districts. It is also necessary to explore how food-based schemes can be linked with development.

The district-level FSI has also been computed by using PCA. The standardised value of each variable

**Figure 6.1: Priority Indicators for Food and Nutrition Security**



**Source:** Computed by IHD Research team.

**Table 6.4: District-level FSI through Principal Component Analysis**

District	Index PCA	Rank	District	Index PCA	Rank
Simdega	3.7	1	Jamtara	1.5	13
Gumla	3.2	2	Hazaribagh	1.3	14
Khunti	3.1	3	Kodarma	1.0	15
Ranchi	2.6	4	Giridih	0.9	16
Dhanbad	2.6	5	Garhwa	0.8	17
Ramgarh	2.4	6	Dumka	0.6	18
Bokaro	2.1	7	Deoghar	0.3	19
Saraikela-Kharsawan	2.0	8	Chatra	0.3	20
Purbi Singhbhum	1.9	9	Palamu	0.1	21
Pashchimi Singhbhum	1.6	10	Sahibganj	0.0	22
Latehar	1.5	11	Pakur	-0.1	23
Lohardaga	1.5	12	Godda	-0.4	24

Source: Computed by IHD Research team.

of all districts is multiplied by the weight. This value will be the overall FSI by PCA method.

It is interesting to note that the correlation of FSI computed through Range Equalization Method (REM) and Principal Component Analysis (PCA) method is 0.880.

### 6.3 Identifying the Priority Districts

The FSI described earlier provides the option of prioritising the developmental efforts in the most food insecure districts. The priority districts are those districts which fall in insecure or highly insecure categories in both FSI (through REM) and FSO. The districts termed as alarming are those which are highly insecure either in FSO or FSI. Three districts namely, Dumka, Deoghar, and Pashchimi Singhbhum fall in

the alarming category. The details of the second group of 13 districts which fall in the ‘need high attention’ group are given in Table 6.5.

A correlation between different dimensions of food security and the outcome indicators was also worked out to know the relation between dimensional index, FSI and FSO Index.

### 6.4 Comparative Significance of Food Security Policy Variables

Table 6.6 presents the comparative analysis of the findings obtained from the FSI and FSO through REM, FSI through PCA method, and their relation. The correlation of FSO with the FSI dimensional index and overall FSI was found to be very low.

The correlation between the Food Utilisation

**Table 6.5: Priority Districts for Food Security Intervention**

Alarming (Both FSI and FSO)	Need High attention (Highly insecure in FSI)	Need High attention (Highly insecure in FSO)
Dumka	Khunti	Bokaro
Deoghar	Chatra	Latehar
West Singhbhum	Garhwa	Ramgarh
Jamtara	Godda	Saraikela-Kharsawan
Pakur		
Sahibganj		

Source: Computed by IHD Research team.

**Table 6.6: Inter-correlation Matrix of Input and Output Components of Food Security with MPI**

	Availability	Access	Utilisation	FSI RE	Outcome	FSI PCA	MPI Rural
Availability	1						
Access	.451*	1					
Utilisation	.434*	0.010	1				
FSI REM	.874**	.689**	.622**	1			
Outcome	-.443*	-0.311	-0.382	-.516**	1		
FSI PCA	.422*	.462*	0.372	.573**	-0.321	1	
MPI Rural	-.472*	-.608**	-.497*	-.714**	.752**	-.474*	1

Note: \*–Correlation is significant at the 0.05 level (2-tailed);  
\*\*– Correlation is significant at the 0.01 level (2-tailed).

Source: Computed by IHD Research team.

Index and FSO is 0.108, which is low. The correlation between FSI (REM) and Food Availability Index is high (0.874) at 1 per cent level of significance. Again, the correlation between FSI (REM) and Access to Food Index is high (0.689) at 1 per cent level of significance. The FSI (REM) is also highly correlated to Utilisation Index (0.622) at 1 per cent level of significance. The FSI computed through PCA is also fairly correlated with FSI computed through REM at 1 per cent degree of significance. The correlation

between Access to Food Index and Food Availability Index has a positive relation at 5 per cent degree of significance (0.451). The correlation between Access to Food Index and Food Utilisation Index is found to be very low.

#### 6.4.1 Food Availability Index

The variables which have been used to develop this index are rainfall variability, per capita value of cereal output, percentage of net irrigated area to net sown

**Table 6.7: Correlation Matrix of the Food Security Index and Indicators**

	Availability	Access	Utilisation	Overall
Rainfall variability	.732**	0.163	0.098	.473*
Per capita value of agricultural output (Cereal)	0.162	0.032	.503*	0.299
Net irrigated area to net sown area	0.071	-0.063	-0.119	-0.044
Urbanisation	.689**	.576**	0.242	.703**
Percentage of agricultural labourers to total workers	0.348	.666**	-0.077	.450*
Percentage of SC and ST populations	-0.100	0.184	-0.228	-0.057
Non-dependency rate	0.401	.487*	0.373	.574**
Monthly per capita consumption expenditure	.409*	.516**	0.233	.534**
Casual wage rate	0.065	0.213	-0.097	0.090
Villages having access to paved road	0.108	.557**	-0.083	0.278
Percentage of households with access to safe drinking water	-0.288	-0.332	-0.029	-0.308
Number of PHC/CHCs per lakh population	0.159	0.005	.423*	0.253
Female literacy rate	.520**	.433*	.556**	.681**
Disease and health behaviour	0.187	-0.332	.462*	0.123
Percentage of households with access to improved toilet facility	0.348	0.280	.599**	.544**

Note: \*\*, Correlation is significant at the 0.01 level (2-tailed);  
\*, Correlation is significant at the 0.05 level (2-tailed).

Source: Computed by IHD Research team.

area, and urbanisation. Rainfall variability (0.732) and urbanisation (0.689) have a very strong correlation with the Food Availability Index. Female literacy rate has a strong correlation with Food Availability Index. Again, the indicators dependency ratio and monthly per capita consumption expenditure (MPCE) taken for access dimension have a strong correlation with Food Availability Index.

#### **6.4.2 Access to Food Index**

Urbanisation among the availability dimension shows a strong correlation with Access to Food Index. Among the six indicators used for this index, percentage of agricultural labourers, has a strong correlation with Access to Food Index. Among the variables taken for food utilisation, only one variable i.e., female literacy rate has a strong correlation with Access to Food Index.

#### **6.4.3 Food Utilisation Index**

The Food Utilisation Index has a strong correlation with the percentage of households with access to improved toilet facility. It has a fairly high correlation with female literacy rate, per capita value of agricultural output (cereal), disease and health behaviour, and availability of PHC/CHCs.

#### **6.4.4 FSI and FSO**

The variables found to have a high correlation with the FSI are urbanisation, female literacy, dependency ratio, percentage of households with improved toilet facility and MPCE. Disease behaviour has a strong correlation with the FSO indicators.

#### **6.4.5 MPI and Food Security**

The MPI for rural areas at district level has significant correlation with the dimensional indices, overall food security and outcome indices. The MPI has a strong negative correlation with Access to Food Index and FSI index at 1 per cent level of significance. On the other hand, MPI has a strong positive correlation with the FSO at 1 per cent degree of significance. It also has negative correlation with Food Availability Index, Food Utilisation Index and FSI computed through PCA method at 5 per cent degree of significance. Hence, as shown in Table 6.6, a clear relation of MPI was found with the food security dimensional, overall and outcome index.

Thus, the statistical robustness of the component indicators used as well as the component indices and overall FSI and FSO computed have been well established.



## CONCLUSIONS AND POLICY IMPLICATIONS

**T**he Food Security Atlas of rural areas is important for mapping and understanding the geographical variability of factors and dimensions affecting food security in order to design evolving targeted policies and programmes for insecure areas. The atlas not only maps and ranks the districts based on their food security situation through a composite index of food security but also analyses its correlates and identifies the policy variables as well as priority districts for better targeting of appropriate policies in vulnerable areas.

This study has used disaggregate-level data to examine the extent and dimensions of food security at the district level in Jharkhand using various indicators from secondary data sources. The Food Security Index (FSI) has been computed through a composite of its main dimensions i.e., Food Availability Index, Access to Food Index, and Food Utilisation Index. The findings from this study revealed that there are large inter-district inequalities across all the three dimensions of food security, i.e., availability, accessibility, and utilization, and such disparities are also visible in case of food security outcomes. Multidimensional Poverty Index (MPI) has also been computed for rural Jharkhand for 2019-2021 to map the status of the districts and to analyse its relationship with FSI and Food Security Outcome (FSO).

### **7.1 Dimensions of Food Security and Key Policy Variables**

The FSI is a composite index covering three dimensions, i.e., availability, access, and utilisation

factors. Food production provides the base for food security as it is a key determinant of food availability. The agricultural economy in Jharkhand is at a very low level of development. Low productivity, lesser use of high yielding variety seeds, low and unequal distribution of irrigation potential are all evident. As a result, the entire state has been considered a food deficit state.

In Jharkhand, agriculture is mainly rainfed. Rainfall is quite erratic and unevenly distributed leading to crop failures. The extent of irrigation is also found to be very low – less than 20 per cent – which is concentrated in a few pockets of the state. This has resulted in low cropping intensity in the state. Along with low irrigation coverage, the state has high instability in food grain production. The average yield of food grains (1805 kg/ha) is also very low in Jharkhand. Beside low productivity growth, there has been little diversification of crops in Jharkhand away from food grains towards possibly higher value, non-food grain crops. The state is by and large single-cropped and has no noticeable production of commercial crops.

Irrigation has a key role in both stabilising agricultural production through an increase in cropping intensity and an associated increase in productivity, improving a district's food security position. It would also provide better prospects in terms of rural employment. However, higher extent of irrigation has not in all cases been translated into higher per capita value of cereal output. Irrigation has helped more in stabilising agricultural production



than in increasing it. There is a wide inter-district variation in the per capita value of cereal production in Jharkhand. The districts with less agricultural land (because of forest, wastelands, mines, industries or urban expansion) or low agricultural productivity have generally low per capita value of cereal output.

The availability of food depends not only on its production expressed in terms of per capita value of cereal output but also on the factors which help in the growth of the food market through growth of non-agricultural income and resultant transport of food from surplus producing areas to deficit areas, and linking habitations to the market. This determines the access to food. Most of the districts in Jharkhand have a very low level of urbanisation. However, owing to the industrial and mining activities, some parts of Jharkhand are more urbanised than most of the major states. Linking such cities with rural areas will bring about improvements in food security and nutrition. Access to paved roads, therefore, has a big role in opening up backward areas, connecting rural producers with larger markets, and in turn reducing rural poverty and food insecurity.

Agriculture provides the major source of livelihood and income for a large number of districts, but the involvement of the household in agriculture is mostly in the form of casual labour. As landlessness is very low among the Schedules Tribes (STs) (partly because of the restriction on transfer of tribal land), districts with a high concentration of tribal population also have a low percentage of agricultural labourers. The districts with a presence of industries and mines also have a generally low percentage of agricultural labourers. The districts which are characterised by high shares of Scheduled Caste (SC) population, who are mostly landless in rural areas of Jharkhand, and very low shares of ST population have high shares of agricultural labourers. Agricultural labourers are characterised by extremely poor physical and human capital, and also by highest poverty levels. Thus, the percentage of agricultural labourers is negatively related to food security.

The ST and SC households are generally more food insecure, largely on account of their economic and social deprivations. The situation in Jharkhand in terms of the ratio of population in the productive age

is found to be worse than in many other states. A low working age ratio implies a greater dependence on the existing productive population. The ratio of working age population in Jharkhand is high in districts with industrial and mining activities due to migration of the working age population to the industrialised and urbanised districts. These people who migrate due to lack of employment opportunities have little food security in their villages but are just as vulnerable in the destination areas.

Per capita consumption expenditure is a good indicator of food security in rural areas. Jharkhand compares very unfavourably with other states in terms of consumption expenditure. Though the state as a whole has very low consumption levels, there are also stark disparities in consumption levels within the state. Casual workers tend to be the least protected and have the lowest level of earnings. The casual wage rate depends on the availability of economic opportunities in the state. Low wage levels directly affect consumption patterns. The casual workers in the unorganised non-agricultural sector as well as the agricultural labourers are particularly vulnerable to food insecurity without the backing of self-produced food.

On the other end of the spectrum, regions with mining and industrial activities along with urbanisation offer employment and income opportunities to a large population, as a result of which the monthly per capita consumption expenditure (MPCE) is high in such areas which make them highly secure in terms of access to food. An improvement in access to employment opportunities, through industrialisation and urbanisation, can go a long way in improving the access to food condition in the highly insecure regions.

Enhancing female literacy has been recognised as the single most important factor contributing to increase in food security and decline in malnutrition and mortality levels through better knowledge of nutritional systems and improved health practices in the household. Jharkhand (60 per cent) is among the five worst performing states in terms of rural female literacy. Though female literacy is low among tribals, all tribal districts do not have low female literacy rates. Interestingly, it is higher in most tribal dominated districts. There is also wide inter-tribe differentiation in female literacy.

Clean and safe water supply is an essential element for achieving food security and good nutrition. Lack of access to clean water has a negative consequence on health and hygiene of people, especially of the poor. The quality of drinking water conditions the effective absorption of nutrients by the human body. Jharkhand stands at the lowest rank with 84 per cent of population with access to improved sources of drinking water. Almost the entire South Chotanagpur division, constituting the highly tribal dominated districts, have among the lowest shares of rural households with access to safe drinking water. The main source of drinking water in these areas are open or uncovered dug wells, which are not protected and is therefore considered as an unsafe source of drinking water.

Primary health services in the state are utterly inadequate, particularly in rural areas. In a state like Jharkhand, with a high burden of communicable and non-communicable diseases because of persisting poverty, primary health infrastructure at the village level assumes huge significance. However, a good number of villages in the state are not adequately covered by a Primary Health Centre (PHC), the most critical health facility in rural areas. Only one PHC has been provided for as many as 99 villages in Jharkhand compared to 25 for all-India level. Lack of primary public health facility forces the vulnerable population to depend on private health services, often leading to indebtedness in rural areas.

Sanitation status, analysed here in terms of access to an improved toilet facility, is again poor in Jharkhand. As per the National Family Health Survey (NFHS)-5, less than half of the households in rural areas have access to an improved toilet facility. Due to lack of sanitation, children are at a high risk of diarrhoea. The prevalence of diarrhoea in rural Jharkhand marked a slight increase from 7.1 per cent to 7.3 per cent during 2015-16 and 2019-2021. There is a clear association between morbidity and severe food insecurity. The children in Jharkhand are at substantially higher risk of chronic and current malnutrition. As of 2019-2021, nearly 40 per cent of children under the age of five in Jharkhand suffered from chronic malnutrition (stunting), approximately 39 per cent were underweight, and 22 per cent suffered

from wasting (NFHS-5). Jharkhand has the third highest percentage of underweight children among the major states. It has the second highest percentage of thin women whose Body Mass Index (BMI) is below normal (BMI < 18.5 kg/m<sup>2</sup>). In Jharkhand, 68 per cent of children are anaemic as of 2019-2021. High levels of malnutrition and child deaths from these regions coupled with high incidence of vector diseases are a pointer towards poor drinking water and health facilities in these villages.

The Atlas also identifies the critical variables which need utmost attention for ensuring food security in rural areas of Jharkhand. The findings reveal that in Jharkhand, per capita value of agricultural output in terms of cereals, percentage of casual labourers in non-agricultural pursuits, female literacy rate, availability of basic health infrastructure in rural areas measured here in terms of number of PHCs/Community Health Centres (CHCs) per lakh population, and access to improved and non-shared toilet facility are crucial indicators that determine the food security status in the rural parts of the districts.

## **7.2 Status of Food Security in the Districts of Jharkhand and Identification of Priority Districts**

The entire Santhal Pargana region (north-eastern part of Jharkhand), except Dumka district, is food insecure to highly insecure with regards to food availability. Jamtara, Godda, Garhwa, Pakur, and Saraikela-Kharsawan districts are placed as highly food insecure with regards to food availability. The districts of Jamtara, Godda, and Pakur suffer from poor food availability with per capita value of agricultural output (cereals) being low due to high rainfall variability coupled with low intensity of irrigation available. The urbanisation rates in these districts are also very low. The districts which are extremely food secure in terms of Food Availability Index are Ranchi, Purbi Singhbhum, Dhanbad, Latehar, and Hazaribagh.

Almost the entire North Chotanagpur division, constituting districts of Hazaribagh, Koderma, Giridih, Ramgarh, Bokaro, and Dhanbad, emerged as highly food secure in terms of access to food. The districts of Santhal Pargana region – Godda, Sahibganj, Jamtara, Dumka, and Pakur – are either

highly insecure or food insecure districts in terms of composite Access to Food Index. Simdega and Garhwa districts have also ranked as highly insecure in terms of access to food. The districts of Sahibganj, Dumka, Godda, Pakur, and Pashchimi Singhbhum suffer from poor access to food with MPCE being very low owing to high percentage of agricultural labourers in Dumka, Godda, and Sahibganj, weekly casual wages being low and dependency ratio being high in Sahibganj, and percentage of STs being high in Pashchimi Singhbhum which has an overall lower socio-economic condition. Lower percentage of villages have access to paved roads in Godda and Pakur.

Ranchi, Purbi Singhbhum, Simdega, Saraikela-Kharsawan, and Gumla emerged as the most food secure in terms of utilisation or absorption of food. On the other hand, districts of Khunti, Pakur, Ramgarh, Bokaro, and Pashchimi Singhbhum are found to be highly insecure in terms of Food Utilisation Index of rural Jharkhand. The districts of Deoghar, Godda, Pakur, and Pashchimi Singhbhum suffer from poor utilisation of food with female literacy rates being low in Deoghar, Godda, Pashchimi Singhbhum, and Pakur, and access to improved toilet facility being poor in Pashchimi Singhbhum, Deoghar, and Pakur. Pashchimi Singhbhum additionally suffers from lack of access to safe drinking water and as a result exhibit high prevalence of diseases like diarrhoea which result in poor utilisation or absorption of food.

Almost all the districts of the Santhal Pargana division are insecure or highly insecure in terms of outcome of food security owing to very high percentage of anaemic as well as underweight children. Districts of Jamtara, Dumka, Deoghar, Pakur, and Pashchimi Singhbhum are found to be highly insecure in terms of Food Security Outcome (FSO) Index of rural Jharkhand. On the other hand, districts of Hazaribagh, Ranchi, Kodarma, Giridih, and Gumla emerged as highly secure in terms of outcome of food security.

In terms of overall food security, the most food-secure districts of Jharkhand are Purbi Singhbhum, Ranchi, Dhanbad, Hazaribagh, and Ramgarh. All these districts are mining-industrial, highly urbanised and developed districts. Together, they form the

development corridor of Jharkhand. Whereas Jamtara, Garhwa, Pakur, Sahibganj, and Godda are found to be the most food insecure. Godda, Sahibganj, and Pakur districts in the Santhal Pargana region collectively form the zone of high food insecurity.

The priority districts are those districts which fall in 'insecure' or 'highly insecure' categories in both FSI (through Range Equalization Method-REM) and FSO. The districts termed as 'alarming' are those which are 'highly insecure' either in FSO or FSI. The food insecurity situation of Dumka, Deoghar, Jamtara, Pakur, and Sahibganj from the Santhal Pargana region and Pashchimi Singhbhum district belonging to the Kolhan region have been marked as 'alarming'.

Among the 24 districts of Jharkhand, 14 districts are on the priority list. Region-wise, the entire belt of the Santhal Pargana region has been marked as 'alarming' in terms of its food insecurity situation. All the districts of the Santhal Pargana region, except Godda, have been flagged off as exhibiting alarming levels of food insecurity based on both input and outcome indicators. Even Godda district from the Santhal Pargana region has been categorised among the districts 'needing high attention' in terms of food security input variables.

### 7.3 Multidimensional Poverty and Food Security Indices

According to the National Multidimensional Poverty Index Baseline Report, 2021 by NITI Aayog on multidimensional poverty, Jharkhand (42.16 per cent) has the second-highest multidimensional poverty among the Indian states. Jharkhand reports significant progress in reducing multidimensional poverty. The Multidimensional Poverty Index (MPI) for rural Jharkhand decreased from 0.246 in 2015-16 to 0.183 in 2019-2021. However, the MPI for the state is still higher than that for rural part of Chhattisgarh (0.12), Odisha (0.11), and the national average (0.10).

As per NFHS-5, more than 50 per cent of the rural population is multidimensionally poor in Sahibganj (59 per cent), Pashchimi Singhbhum (62 per cent), and Pakur (58 per cent), whereas less than 30 per cent of the rural population is multidimensionally poor in Ranchi (26 per cent) during 2019-2021. The districts of Ranchi (0.100), Bokaro (0.130), Purbi

Singhbhum (0.130), Saraikela-Kharsawan (0.130) show the lowest MPI, while the less developed districts such as Paschimi Singhbhum (0.300), Sahibganj (0.290), Pakur (0.270), Dumka (0.220), and Deoghar (0.220) have the highest MPI figures as per NFHS-5, 2019-2021.

The MPI for rural areas at district level has significant correlation with the dimensional indices of food security, overall food security, and outcome indices. The MPI has a strong negative correlation with Access to Food Index and FSI at 1 per cent level of significance. On the other hand, MPI has a strong positive correlation with the FSO at 1 per cent degree of significance.

#### 7.4 Policy Implications

Overall, the policy focusses the state should be to expand availability of food through better irrigation facilities in this otherwise rainfed region which suffers from high rainfall variability year-on-year, increasing access to food through provision of employment opportunities in non-farm sector which in turn will better the economic dependency ratio, increase the casual wages which will eventually augment the MPCE. The focus should also be on improving the utilisation or absorption of food through enhancing the provision of basic health infrastructure, safe drinking water, and access to improved toilet facilities which will reduce the prevalence of diseases like diarrhoea. Improvement of female literacy rates is crucial for the entire region which will go a long way in enriching the households' nutritional intakes owing to better exposure and knowledge about healthy diet, sanitation and hygiene practices, and health behaviour. It can also improve the purchasing power of the household and in turn enhance their MPCE. Literacy and adult literacy programmes should be undertaken in priority districts to begin with.

Some important policy measures are as follows:

##### Reduce the Impact of Rainfall Variability

Rainfall variability leads to instability into the yield of all crops including food crops. This leads to fluctuations in availability of food. The households who are at the margins in the state are the most affected due to such fluctuations. The metrological

droughts are few but agricultural droughts are most frequent. So, the key intervention would be storage of rainwater and its usage for irrigation. Even the areas which have high irrigation intensity are dependent on the monsoons. Rain harvesting is very important for the priority districts. Constructing check dams including gullying, trenching, renovation of ponds, and improvement in recharge can be undertaken. These programmes can be initiated on a large scale under Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) and Integrated Watershed Programmes. These will create both short-term and long-term employment opportunities in the state. This will also provide water for drinking and other purposes.

The Government of Jharkhand has been conscious of the water requirements and has been working towards the storage and harvesting of rainwater through various programmes such as construction of farm ponds or *Dobbas*. This study recommends that the 10 most insecure districts be given priority in water related management which is vertical for food security.

##### Diversification of Crops, Food Basket, and Promotion of Kitchen Gardens

Agriculture in Jharkhand is mostly mono-cropped and rainfed with paddy being the main crop grown as well as consumed in these areas. Therefore, increasing productivity of paddy, increasing irrigation facilities, increasing cropping intensity, and crop diversification by including cultivation of vegetables and pulses are the best bet to ensure food security in these areas. Increasing storage facility is also imperative as there is high storage wastage due to lack of proper facility for the same.

Kitchen Gardens, both at individual as well as at community levels at Anganwadi centres etc., as being introduced as *Poshan Vatikas* should be extensively implemented to diversify the food basket. Apart from vegetables, locally grown greens (*saag*) can be grown in these Kitchen Gardens to ensure a micro-nutrient secure diet. Kitchen Garden in Anganwadi centres will provide easy access to fresh and nutritious fruits and vegetables which can be used in the preparation of food in Anganwadi centres for the children. Further,



it will also help other households to access fresh vegetables from the Anganwadi centre. This will also motivate the household particularly the women to start or maintain the kitchen garden in their homestead land. This will ultimately improve the health, nutrition, and environmental aspect of the village.

### **Provision of Employment and Investment in Non-Farm Sectors**

Household's food diversity depends on the availability of money and affordability. The rural people are vulnerable due to the lack of employment opportunities available within their village. Expanding jobs under MGNREGA is one such way of providing employment opportunities in rural areas. Also, there is a need to increase the number of days of availability of jobs under MGNREGA to increase the effectiveness of the programme.

Expanding investment in allied sectors i.e., fishing, livestock rearing, food processing, and processing of non-timber forest products (NTFPs) in rural Jharkhand can further increase employment opportunities. For example, fishing activity in community ponds, rural enterprise based on local food, processing of NTFPs and linking them to the market, dairy cooperative among others. Such an investment will also lead to employment in service sectors such as storage and transport.

### **Promotion of Millets**

The millet mission under the National Food Security Mission (NFSM) encourages millet production in tribal areas. Millets, being a drought-resistant crop, is most suited for cultivation in these rainfed regions with limited irrigation facilities. They can grow in poor soil conditions with less use of water, fertiliser and pesticide. They can withstand higher temperatures too. Despite its high level of protein content, Millet is generally considered a neglected crop. The universal acceptability of millet will increase the availability of the product not only in the tribal areas but also in other parts.

Jharkhand Government has launched the Millets Mission on priority basis. For the most food insecure areas, there should be procurement of millets for distribution through the Public Distribution System (PDS). Millets should also be included in the PDS to increase nutritional security rather than just

carbohydrate-based ration distribution, as PDS is a major source of ensuring food security. Distribution of millets through PDS can further enhance the nutritional outcomes of the households.

There is also increasing demands for millets in the urban areas, the packaging and processing of which gives additional employment and income opportunities in the food insecure areas of the state. A group approach (Self-Help Group [SHG], farmers association, or any other local groups) can play an important role in the production, processing, and marketing of millet-based traditional and modern food like laddu, kheer, cookies, cupcakes, chips etc.

### **Promote Access to Water, Sanitation, and Hygiene (WASH)**

Food security and nutritional challenges cannot be met until adequate and diverse food as well as safe drinking water, sanitation, and hygiene (WASH) are available at the household level. Without proper access to safe drinking water and sanitation, households face the problem of diarrhoea, and other intestinal diseases and eventually end up being undernourished. It is a vicious cycle: intestinal diseases contribute to undernutrition through decreased nutrient absorption, while undernutrition reduces the body's ability to fight off further infections. Hence, for the long-term impact of the nutritional programme, water facility, as well as sanitation facility for the people in the rural areas, needs to be ensured. To improve the accessibility of the water, technology needs to be updated by introducing solar power, electric hand pump would help access water easily. There is a need for proper monitoring of the Swachh Bharat Mission (SBM) to accelerate the sanitation coverage in rural areas.

Lastly, poverty and multidimensional deprivation influence the food and nutrition security outcomes. Hence, there is a need for multi-sectoral convergent intervention to reduce food insecurity and malnutrition rather than any stand-alone programme. Further, there is a need to improve the livelihood opportunity by providing better education, health infrastructure as well as basic amenities which are very critical to augment the impact of food and nutrition security outcomes.

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