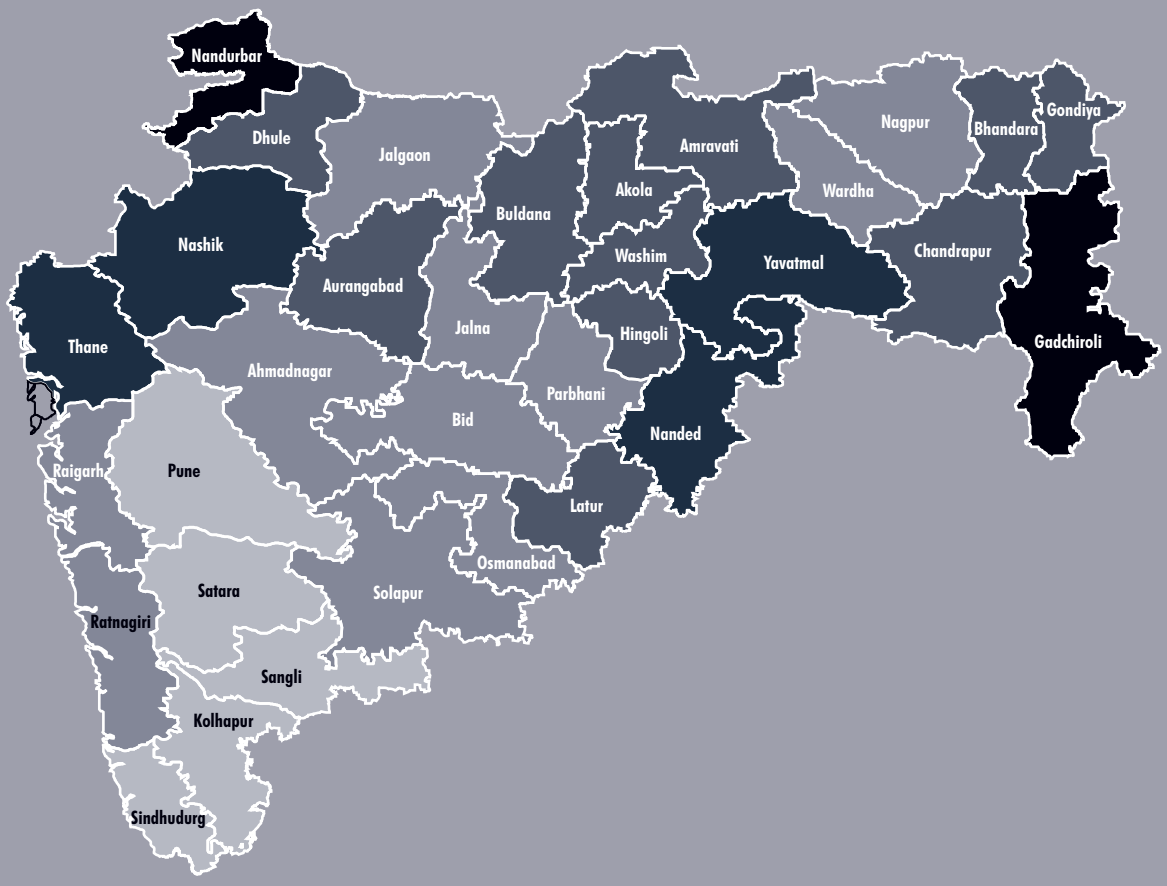
Food Security Atlas
Of RURAL MAHARASHTRA



The UN World Food Programme

Institute for Human Development

Food Security Atlas
Of RURAL MAHARASHTRA

WFP
World Food Programme
wfp.org

The UN World Food Programme
2 Poorvi Marg, Vasant Vihar
New Delhi 110057
www.wfp.org

Institute for Human Development
NIDM Building, IIPA Campus
New Delhi 110002
www.ihdindia.org

The UN World Food Programme (WFP)
2, Poorvi Marg
Vasant Vihar
New Delhi - 110057

Maps not to scale

Published by:
Institute for Human Development
NIDM Building, IIPA Campus, 3rd Floor, IP Estate
Mahatma Gandhi Marg, New Delhi – 110002
Website: www.ihdindia.org; Email: ihd@vsnl.com

Design by:
CELLULOID
C-45, Ground Floor, Pandav Nagar, Delhi 110 092
Tel.: 98737 98727, 011-22487531
e-mail: celluloid@gmail.com

Layout, Typesetting and Printed by:
PRINT-WAYS
G-19, IInd Floor, Vijay Chowk, Laxmi Nagar, Delhi - 110 092
Tel.: 011-22514076, 9990563789, 9899094076
e-mail: printways@gmail.com; printways@rediffmail.com

RESEARCH TEAM

Institute for Human Development

Dev Nathan

Preet Rustagi

Sandip Sarkar

Sunil Kumar Mishra

Abhay Kumar

Payel Dutta Majumder

The UN World Food Programme (WFP)

Pradnya Paithankar

Bal Paritosh Dash

TECHNICAL ADVISORY GROUP

Chairperson

Prof. Abhijit Sen, Member, Planning Commission

Members

Dr. Indu Agnihotri, Centre for Womens' Development Studies, New Delhi

Dr. V. Athreya, M.S. Swaminathan Research Foundation, Chennai

Prof. Ramesh Chand, National Professor, National Centre for Agricultural Policy, New Delhi

Ms. Anita Chaudhuri, Joint Secretary, Department of Food and Public Distribution

Prof. R. S. Deshpande, Institute for Social and Economic Change, Bangalore

Prof. Mahendra Dev, Centre for Economic and Social Studies, Hyderabad

Dr. Amaresh Dubey, National Council for Applied Economic Research

Mr. N. D. George, Director, Planning Commission

Prof. S. R. Hashim, Director, Institute for Studies in Industrial Development, New Delhi

Dr. P. K. Joshi, Director, National Centre for Agricultural Policy, New Delhi

Prof. K. P. Kannan, National Commission for Enterprises in the Unorganised Sector

Prof. Amitabh Kundu, Jawaharlal Nehru University

Dr. Minnie Mathew, World Food Programme

Mr. A. K. Mathur, Director, National Sample Survey Organisation

Prof. Aasha Kapur Mehta, Chronic Poverty Research Centre, Indian Institute for Public Administration, New Delhi

Prof. T. S. Papola, Delhi Government Chair in Human Development, Institute for Human Development

Prof. R. Radhakrishna, Indira Gandhi Institute for Development Research, Mumbai

Dr. D. Narsimha Reddy, Former Professor, University of Hyderabad

Dr. Rukmini, M. S. Swaminathan Research Foundation, Chennai

Prof. Vidya Sagar, Institute for Development Studies, Jaipur

Dr. Abusaleh Shariff, National Council for Applied Economic Research

Prof. A. K. Singh, Giri Institute for Development Studies, Lucknow

Prof. R. S. Srivastava, National Commission for Enterprises in the Unorganised Sector

Prof. Prem Vashishtha, Institute for Human Development

ik- vfHkthr lu
Prof. ABHIJIT SEN

सत्यमेव जयते

InL;
;ktuk vk;kx
;ktuk Hkou
ub fnYyh&110 001
MEMBER
PLANNING COMMISSION
YOJANA BHAWAN
NEW DELHI-110 001

FOREWORD

Food Security has now taken centre stage in policy discussions around the world. Along with issues of food production there are also clearly issues of access of the poor to food. In India, despite high GDP growth rates over the past decade or so, the record in reducing hunger is not so impressive. This brings to the fore the question of inclusive growth, particularly the inclusion of the most deprived sections of our society and regions of our country into benefiting from the growth process. Increased access to food comes forward as a basic component of inclusive growth.

It is apt that at such a time the Institute for Human Development (IHD) and the UN's World Food Programme (WFP) have produced this set of Rural Food Security Atlases for 8 States of India.

Constructing a Food Security Index (FSI) the authors have tried to identify the districts that fare particularly badly and the factors behind the poor performance of these districts in each of the States. The identification of regions and social groups that are most food insecure should help to draw attention to the regions and social groups that require most attention in order to reduce food insecurity. At the same time, analysis of factors behind poor food security should help direct district-level interventions towards dealing with the factors that seem to be behind poor food security in these districts.

The authors argue while paying attention to increasing food supply, it is critical to pay attention to improving the access of the poor to adequate food. They identify improvements in infrastructure and in the position of women as central to improving food security.

I hope the Atlases will stimulate discussion among policy makers and social analysts on ways of designing district-level interventions that would enable India to reduce hunger as part of inclusive growth.

Abhijit Sen

[ABHIJIT SEN]

njHkk"k % 23096564 VyhQDl % 23096565
Telephone: 23096564 Telefax : 23096565 e-mail: abhijitsen@yojana.nic.in

Preface

India is home to more than a quarter of the hungry people in the world. The effect of climate change on agriculture will adversely affect Indian agriculture, thereby making food availability scarce. The existing production levels barely manage to keep pace with the growing population, a problem that is aggravated by high disparities in resources and purchasing power.

The changing scenario of rising food prices has raised new concerns about food security. It has been estimated that globally 130 million more people have become food insecure due to high food prices, in addition to the existing 850 million. Soaring prices would require providing top priority to ensuring access to food by the most vulnerable, which can be achieved through expanded safety net programmes such as the PDS, and those programmes which address the nutritional status of pregnant and lactating women, and children of less than five years of age.

The prevalence of underweight children in India is among the highest in the world. Over 50 million children under five years are malnourished. There are multiple causes of this phenomenon. Looking at the problem spatially, a relatively small number of states, districts, and villages account for a large share of the problem – 5 states and 50 percent of villages account for about 80 percent of the malnutrition cases.

Therefore, the need of the hour is a comprehensive strategy to tackle the growing menace of food and nutritional insecurity. In a country of continental dimensions with vast disparities, it is pertinent that developmental efforts be directed in specific directions and in specific areas for optimum utilization of resources.

To map food insecurity in the country, the World Food Programme had come out with a series of food insecurity atlases in collaboration with the M.S. Swaminathan Research Foundation. The most significant contribution of these atlases was to mainstream the issue of food security, besides identifying their incidence among the major states.

As a corollary to these atlases, on behalf of the WFP, the Institute for Human Development has prepared state-specific atlases with comprehensive analysis at district and regional levels. Looking through the child nutrition lens in view of prevalence of underweight children, and under-five mortality, these atlases help in identifying the districts at various levels of food security within the most food insecure states. This will help in convergence of complementary programmes of the government in addressing undernutrition and child mortality in the country.

We are deeply indebted to all the members of the Technical Advisory Group (TAG), constituted to provide direction and technical inputs to the report. We would like to express our sincere gratitude to the TAG chairperson Prof. Abhijit Sen, Member, Planning Commission for his encouragement and deep involvement in this project. We wish to thank DFID for providing support to develop these food security atlases.

Much of the credit for bringing out this publication goes to Dr. Dev Nathan, Professor, and Dr. Preet Rustagi, Senior Fellow, who coordinated the study from IHD; Dr. Sandip Sarkar, who provided the technical advice, especially the construction of the indices; and Dr. Sunil Mishra and Ms. Payel Dutta Majumder who executed the work of calculation of indices and analyzing the data. Dr. Abhay Kumar put the report together and saw them through the press. We would also like to express our gratitude to Dr. Minnie Mathew, Head of Programme Unit, WFP-India for providing her guidance to the study; Dr. Nisha Srivastava, who led the project in WFP; and Mr. Bal Paritosh Dash, Ms. Pradnya Paithankar and Mr. Animesh Kumar for providing their critical inputs.

We hope that the atlases will serve as a tool for the government and policymakers to target interventions more effectively and fine-tune assistance strategies to target the most vulnerable groups and areas. An important outcome of this exercise is a systematic and integrated food security information system located within the state governments. Finally, it will enhance advocacy at the state level so as to direct policy focus, resources and initiatives to the most food insecure.

Alakh N. Sharma
Director,
Institute for Human Development

Mihoko Tamamura
Representative & Country Director,
World Food Programme – India

Acknowledgements

The preparation of food security atlases for eight states would not have been possible without the joint efforts of various organizations, individuals and government officials. The primary input for construction of the indices as well as formulation of appropriate indicators is reliable disaggregated sub-state level data, which was collected, collated and mined from secondary sources as well as based on information made available by various state departments and ministries. We wish to thank all of them for their support and assistance. We are grateful to the Department for International Development (DFID) for funding the project through the Global Institutional Support Grant to WFP.

The Chairperson of the Technical Advisory Group (TAG), Prof. Abhijit Sen, Member, Planning Commission and other members of the TAG deserve a special mention for all the deliberations in the meetings held and their expert advice to the research team from time to time. Many of them were also available at short notice to help us resolve problems, provide solutions and show the way forward. We wish to thank them all for their cooperation and support.

We would like to thank Mr. Michael Sheinkman, WFP Senior Regional Programme Adviser for Vulnerability Analysis and Mapping in WFP's Regional Bureau at Bangkok for his presentation and participation at some of the state consultations.

The smooth execution of this project would not have been feasible without constant support and inspiration from Prof. Alakh N. Sharma, Director, IHD. We wish to thank him for his cooperation, ideas and discussions held during the entire period of the project.

We would like to thank Ms. Mihoko Tamamura, the current Representative and Country Director of WFP – India, Mr. Dominique Frankefort, Former Deputy Country Director and Mr. GianPietro Bordignon, Former Representative and Country Director and for their encouragement at every stage.

We wish to also acknowledge the research and data support received from many individuals in the course of the project period. These include Ms. Piyali Das, who undertook the literature review during the initial phase of the project; and Mr. Pinaki Joddar and Mr. Balwant Singh Mehta, who very ably mined large data sets of the NSSO for extracting relevant information and provided additional research inputs. Dr. Ramashray Singh collected district-level data for Maharashtra from the government offices at Mumbai.

The support received from IHD administration needs to be acknowledged, especially Mr. Prem Chandra, Ms. Jyoti Girish, Ms. Madhavi Chauhan, Ms. Nidhi Sharma, Mr. Sanjay Kumar and Mr. Phalguni Singh. Mr. S.P. Sharma undertook all the typing and pagesetting work and Ms. Shashikala Menon did the copyediting. We wish to thank all of them. We thank Mr. Yatinder Bisht for designing, Mr. Nitin Chauhan for formatting, and S P Printech for printing support.

– IHD and WFP Research Team

Contents

List of Tables, Figures, Maps and Boxes

List of Abbreviations

ADAPT	Area Development Approach for Poverty Termination
AIDIS	All-India Debt and Investment Survey
APL	Above Poverty Line
ARWSP	Accelerated Rural Water Supply Programme
BMI	Body Mass Index
BPL	Below Poverty Line
CMR	Child Mortality Rate
CSO	Central Statistical Organization
DLHS	District-level Household Survey
DPAP	Drought Prone Area Programme
FAO	Food and Agriculture Organization
FCI	Food Corporation of India
FFS	Farmers' Field School
FSI	Food Security Index
FSO	Food Security Outcome
FSOI	Food Security Outcome Index
GSDP	Gross State Domestic Product
HYV	High Yielding Variety
ICDS	Integrated Child Development Services
ICT	Information and Communication Technology
IFAD	International Fund for Agricultural Development
IHD	Institute for Human Development
IIPS	International Institute for Population Sciences
IMR	Infant Mortality Rate
LTAP	Long Term Action Plan
MDGs	Millennium Development Goals
MDM	Mid-Day Meal
MHDR	Maharashtra Human Development Report
MMS	Mid-Day Meal Scheme
MPCE	Monthly Per Capita Expenditure
MSSRF	M S Swaminathan Research Foundation
NCEUS	National Commission for Enterprises in the Unorganized Sector
NCRL	National Commission on Rural Labour
NFHS	National Family Health Survey
NFSM	National Food Security Mission
NREGA	National Rural Employment Guarantee Act
NREGS	National Rural Employment Guarantee Scheme
NSDP	Net State Domestic Product
NSS	National Sample Survey
NTFP	Non-Timber Forest Product

OBC	Other Backward Class
PDS	Public Distribution System
PESA	The Panchayats (Extension to Scheduled Areas) Act
PHC	Primary Health Centre
PMGSY	Pradhan Mantri Gram Sadak Yojana
RLTAP	Revised Long Term Action Plan
RTI	Right to Information Act
SC	Scheduled Caste
SCA	Special Central Assistance
SCP	Special Component Plan
SHG	Self-Help Group
ST	Scheduled Tribe
TE	Triennium Ending
TSP	Tribal Sub Plan
UNICEF	United Nations Childrens' Fund
WFP	World Food Programme
WFS	World Food Summit
WHO	World Health Organization

Executive Summary

Executive Summary

Food security is not just a matter of the availability of food, but even more of the access of households and individuals to sufficient nutritious food. The nutritional status of an individual is also influenced by access to safe drinking water, facilities for hygiene and sanitation. Consequently, food security is analyzed along the axes of availability, access and absorption. The importance of entitlements in food security is further underlined by the Supreme Court's judgments validating the Right to Food. As a signatory to the UN's Millennium Development Goals (MDGs), the Government of India and all state governments have an obligation to reduce by half the proportion of people suffering from hunger by 2015.

As a step towards the above goals, the Institute for Human Development (IHD) on behalf of the UN's World Food Programme (WFP) has undertaken an analysis of the dimensions of food security at the sub-state or district level for 8 states of India – Orissa, Jharkhand, Chhatisgarh, Madhya Pradesh, Rajasthan, Bihar, Uttar Pradesh and Maharashtra. The purpose of this exercise is to:

- Identify the districts/regions and social groups most affected by food insecurity; and
- Suggest policy interventions for improving food security among food insecure regions and social groups.

Recognizing that reduction of acute poverty is the key to reducing hunger, the analysis began by choosing the likely variables that affect food security along the three axes of availability, access and absorption. A composite index is based on twelve identified indicators which reflect these three dimensions. The availability-related variables considered here are agricultural production in per capita value terms, proportion of forest area, extent of irrigation and rural connectivity in terms of villages with access to paved roads. The six variables considered for the access-to-food dimension include proportion of agricultural labourers, ratio of working age population, monthly per capita consumption expenditure, casual wage rate of rural persons and female literacy rate. Access to safe drinking water and primary health services are the two variables considered for the absorption index.

The values of districts on each of these twelve variables were combined to develop a Food Security Index (FSI), on the basis of which each district was ranked. Districts were also ranked by their performance in food security outcome (FSO) measures, under-five mortality and proportion of underweight children.

The most food insecure districts in Maharashtra are located in:

The more food insecure districts of Maharashtra fall into two groups. One is of the hill-forest districts, such as Nandurbar and Gadchiroli. The other and larger group of districts is in the semi-arid plains of the Deccan Plateau, i.e the districts of the regions of Vidarbha and Marathwada. The district of Thane

Priority Districts for Food Security Intervention

Coastal	Inland Northern	Inland Central	Eastern	Inland Eastern
Thane	Nandurbar	Nanded	Gadchiroli	Yavatmal
	Nashik		Bhandara	Nagpur
			Chandrapur	Wardha
			Gondiya	

does fall within the category of those performing the worst, but it has two clear regions. One is the urban and industrial area of Thane and the adjoining areas, and the other is the hill-forest region of the Western Ghats lying within the district. NSS region wise one district namely Thane falls in Coastal region, two districts fall in Inland Northern region which is adjoining Thane. Nanded from the Inland central region, Gadchiroli, Bhandara, Chandrapur and Gondiya from the Eastern region and three districts namely Yavatmal, Nagpur and Wardha from the Inland Eastern region has been identified as priority districts.

In general, however, the districts of Maharashtra fare poorly on nutritional outcomes, with only the more urbanized and industrialized districts and the irrigated districts of Western Maharashtra, including the coastal belt, doing better. Thus, ensuring food security and improving the nutritional status is a challenge for the rest of the state of Maharashtra as a whole. The identification of certain districts for priority action does not mean that either resources or efforts to bring up all districts can slacken, but only draws attention to the need for more inclusive growth efforts and the special efforts needed to bridge the divides between different regions and districts of the state.

Access to roads and irrigation are two areas in which the hill-forest districts of the state considerably lag behind the country. Rural connectivity and small-scale irrigation in a manner appropriate to hill regions, along with improvement in female literacy**,** should form the core of efforts to reduce extreme poverty, and thus hunger, in the hill-forest districts of Maharashtra.

Along with this, special efforts are needed for development of livelihoods of forest-based populations. This itself comprises a number of measures, including:

- Implementation of the Forest Rights Protection Act so as to provide security of tenure
- Investment to enable a shift to production of high value crops
- Shortening the chain of intermediaries and promoting value-added processing in non-timber forest products (NTFP).

The changes in production that would reduce food insecurity require not just improved access, but also enhanced capabilities, through extension and technological development, building on local

capacities and knowledge.

Measures to increase household and individual incomes need to be supplemented by Community Forest Management (CFM), which can enable communities to balance production and local environmental concerns.

Complementary steps need to be taken to enhance women's agency in the household and community, through

- literacy and education
- women's land rights.

Enhancing women's capabilities could, among other benefits, also lead to the adoption of improved nutritional practices, such as exclusive breast-feeding of infants till six months of age.

Micro-finance, through self-help groups (SHGs) supported by NGOs, could help

- reduce the incidence of inter-linked transactions, which result in very low net income
- improve the food security situation by enabling borrowing for critical needs, and
- also increase the share of household income under the control of women.

In Maharashtra there are four issues of land reform that need to be tackled in order to improve food security:

- Restoration of illegally-acquired tribal lands
- Distribution of land to landless, largely Scheduled Castes (SCs) and Scheduled Tribes (STs)
- Provision of security of tenure of Scheduled Tribes (STs) in forest areas
- Women's land rights

Maharashtra has a large proportion of agricultural labourers in the rural workforce. Schemes of distribution of agricultural land to the landless, including women, would help in improving access of the rural poor to food and thus reduce food insecurity. Increasing productivity in common lands, often unmanaged pastoral or otherwise degraded lands, would also increase food security.

Maharashtra, however, also has a large semi-arid belt in the Marathwada and Vidarbha regions. The agricultural production here is largely rainfed. It is also the area which has seen large numbers of

farmers' suicides. Revitalizing this agriculture is a necessary step to reduce food insecurity, as that would increase both employment of labour and wage rates. Employment-based programmes (e.g. NREGA schemes) can themselves be planned to improve infrastructure to provide needed public goods (roads), or quasi-public goods (irrigation) for the area.

Improvement in the implementation of these government schemes depends, at one level, on improvement in administration and governance systems. But more important is the role of the people who are to benefit from the schemes, whether organized through CBOs, NGOs or traditional tribal bodies – in both **demanding and monitoring implementation** of the numerous schemes.

Enhancing capabilities, through rights, access to resources and training, will clear the road for building the **capacity** to aspire – the aspirations for a better life exist, but the means or capacity to realize those aspirations are lacking.

Finally, enhancing rural food security is not only a matter of increasing agricultural productivity. In arid, semi-arid hill-forest regions, with existing technology, the agricultural potential is quite limited and there is a narrow limit to the extent to which agricultural productivity can be increased, In order to substantially increase per capita incomes in these rural areas, it would then be necessary to shift a large number of the workers in agriculture and thus increase per capita rural areas. Thus, improving food security in the semi-arid and hill-forest regions crucially depends on the extent to which rural workers from the problem of rural food insecurity does not lie within the rural economy alone, but on the transformation of the structure of the whole economy. Finally, enhancing rural food security is not only a matter of increasing agricultural productivity. In arid, semi-arid hill forest regions, with existing technologies, the agricultural potential is quite limited and there is a narrow limit to the extent to which agricultural productivity can be increased. In order to substantially increase per capita incomes in these rural areas, it would be necessary to shift a large proportion of workers out of agriculture through generation of non-farm employment avenues. Thus, improving the ford security in the semi-arid and hill-forest regions crucially depends on the transformation of the structure of the economy.

*****

1. Introduction

India has seen an impressive growth rate in the last decade with the GDP averaging more than 7 per cent per annum. Despite this rapid growth, India is still home to more than a quarter of the hungry people in the world. Rapid growth has not translated into a commensurate reduction in poverty and hunger. The current turmoil in world food markets, with sharp rises in food prices, and the recent global economic downturn together threaten to make the food security situation in India even worse. Despite significant achievements in food grain production, high incidence of hunger and under-nutrition continue to plague the country.

These vicissitudes bring home the stark truth that food security is a critical and continuing challenge and there is no place for complacency on this front. In 1996, the World Food Summit (WFS) and subsequently the Millennium Development Goals (MDGs) adopted at the UN recognized the importance of achieving food security and reducing hunger by half by the year 2015.

As a follow-up to the WFS, a 2002 assessment called "World Food Summit - Five Years Later", pointed out that there has been a decrease in hunger at the rate of 8 million people per year across the world. But in order to even achieve the goal of reducing world hunger by half by 2015, it is necessary to reduce the incidence of malnutrition by 15 million per year. Continuing to implement the economic, political and social policies now in place will not enable the world to reach the goal by 2015. A mid-course correction in economic, political and social policies is needed in order to achieve the above stated goals.

Despite India recording a high rate of economic growth in recent years, there is a major concern with the failure of that growth to translate into a somewhat proportionate reduction in poverty and malnutrition. The problem of large-scale famine-related starvation deaths seems to have been largely resolved partly, due to combined efforts from vigilant civil society and media. Nonetheless, there are periodic reports of malnutrition and starvation from different parts of the country; particularly from the politically marginal social groups, the Scheduled Tribes (STs) and Scheduled Castes (SCs). Besides this problem of starvation among the STs, there is the pervasive incidence of malnutrition, particularly of children and women. Even sustained increases in income have not resulted in commensurate improvements in nutritional status.

The persistence of malnutrition and the reported occurrence of starvation deaths together define the nature of the current problem of food insecurity within a situation of overall adequate availability of foodgrains. The fact that they occur within a situation of adequate foodgrain availability (domestic foodgrain production plus amounts released from government stocks plus imports made possible by India's burgeoning foreign exchange reserves), serves to underline the importance of framing adequate policies and interventions to ensure food security, or access to food, for not just households, but also individuals. It also provides the rationale for this report, prepared by the Institute for Human Development (IHD), on behalf of the United Nations' World Food Programme (WFP).

The UN World Food Programme and the M S Swaminathan Research Foundation (MSSRF) earlier collaborated in analyzing the food insecurity situation in different states in the country. Using chosen indicators to map the relative standing of states with regard to food security, MSSRF and WFP prepared the *Food Insecurity Atlas of Rural India* in 2001. This was followed by the *Food Insecurity Atlas of Urban India* in 2002. The third in the series, the *Atlas of Sustainability of Food Security* was launched in 2004. The Atlases raised the bar in the analysis and understanding of food security across states, while also posing the fresh challenges at the same time. They brought into focus the need for analysis at the sub-state level. States in India are typically large and diverse. Intra-state disparities in socio-economic development impact on the food security status of households. For effective policy and focused intervention, identifying and mapping the worst-off areas is important. Following the path-breaking national-level atlases, it was decided to extend the analysis to the district level, the level at which food security interventions should be planned and implemented.

The need for such disaggregated analysis is only matched by the dearth of data at such levels. To take just one example, we do not have estimates of an important indicator like poverty for a district. Strengthening planning and performance requires that more data is available at the district level. In this regard, the District Level Household Surveys (DLHS) and planned annual health surveys show welcome progress. These surveys provide valuable demographic data and information relating to reproductive and child health.

The main objectives of this report are to analyze the nature and dynamics of the food security situation at the sub-state level and suggest location-specific strategies. It is hoped that this Atlas will stimulate strategic action and further desired analysis. Food security must be brought to the forefront of the development and political agenda not only at the Centre, but in a vibrant federal structure like India, in the states as well.

1.1 What is Food Security?

What constitutes food security has gone through two phases of understanding or definition. In the 1970s, food security was understood as the 'availability at all times of adequate world food supply of basic foodstuffs..'. (UN, 1975). But the 1981 publication of Amartya Sen's *Poverty and Famines: An Essay on Entitlement and Deprivation* brought forward a new understanding of the problem of hunger or food security. Rather than just the 'availability' of food, Sen emphasized 'access' to food through what he called 'entitlements' – a combination of what one can produce, exchange in the market plus state or other socially provided supplies. What Sen posited is that availability or supply of food does not itself create entitlements for food. In a sense, Sen's emphasis on entitlements is similar to Keynes' notion of 'effective demand'. Both entitlement and effective demand are quite different from need. Since Keynes was dealing with a fully capitalist market economy, with only two classes, employers and workers, all effective demand was related to monetary income. But Sen is dealing with a 'mixed economy' with at least three classes, employers, workers and peasants or other own-account producers. For those who produce food, part, if not all, of their entitlement is due to their own

production. This portion of the consumption of food is not mediated by the market. Consequently, this is not captured by the market-based notion of effective demand.

What an individual or household can consume or access depends on the individual's or household's entitlements. Entitlements draw attention to the conditions under which people access food, whether from direct production (or exchange with nature), market exchange (income from either goods produced or wage labour) and social security measures. Entitlements also draw attention to the rules that govern intra-household allocation, as a result of which women and girls may face hunger or deprivation even though they are part of households whose general entitlements are sufficient.

Food, of course, is not an end in itself. Food is consumed for nutrition. Instead of focusing attention on the commodity, one can look at the objective for which food is consumed, that is providing nutrition for the body. The purpose of nutrition itself is not just to survive, but to lead a healthy and meaningful life – to be in the state one wants to be (well-being) and to do various things one wants to do.

At one level, some health questions, like the prevalence of intestinal parasites, affect the very ability of the human body to absorb nutrients. Thus, health concerns, focused on the availability of clean water and access to health facilities, are very much part of the very concept of food security itself. At another level, some health issues, like AIDS most dramatically but also endemic malaria, affect the ability of the individual/household to engage in those livelihood activities that could ensure food security. Consequently, in order to deal with food security, it is not sufficient to pay attention to food alone, but also access to, at least, clean water and sanitation, which affect the ability to absorb food, or turn consumption of food into nutrition. It may thus be seen that all these factors affect food security in one way or the other. Hence they can be used as components of elementary well-being needed to lead a healthy and meaningful life.

Entitlements point to the fact that hunger is situated within poverty, rather associated with extreme poverty, as a result of which households and individuals do not have adequate entitlements to food. Thus, the elimination of hunger is the first landmark in reducing poverty.

Capabilities are a combination of two factors – states of well-being (like being well nourished, being healthy, and so on) and activities (achieving self-respect, or being socially integrated). Self-respect and social integration are in themselves goals of a meaningful life. But they are also instrumentally important, in that those without self-respect or the socially marginalized may not be able to achieve food security. Consequently, achieving self-respect or playing a meaningful part in social life may both be necessary to achieve food security.

Given women's general responsibility for food security in rural areas of developing countries, and given the pervasive gender bias in these societies, reduction of poverty translates into the empowerment of poor women. Consequently, food security approaches have been increasingly paying attention to the elimination of gender inequality and women's empowerment as important preconditions for food security.

Empowerment of poor women, or of the poor as a whole, is not only a matter of individual agency (which itself might be dependent on collective mobilization) but also of the poor putting their stamp on economic policies. This is necessary in order to bring about the much-needed political will that is often lacking, to focus adequate attention to food security policies. Without adequate political pressure for reform, proper food security policies are unlikely to be adopted. There can be no question that the political mobilization of the poor is required for such a food security policy to be implemented.

All these changes in the understanding and context meant that 20 years after the 1975 World Food Summit, there was a substantial shift in understanding the meaning of food security. From the 1975 emphasis on adequate food supply, the 1995 World Food Summit declared '…food security, at the individual, household, national, regional and global levels …exists 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.' (FAO, 1996, 3, emphasis added). The declaration further recognizes that 'poverty eradication is essential to improve access to food.'

The international discourse on food security has further developed along the lines of the right to food. This right to food (as discussed in greater detail in the Appendix on Right to Food) derives from the 1948 UN Declaration on Universal Human Rights. Through subsequent instruments, the meaning of the right to food has been spelt out. In particular, the 1999 International Covenant on Economic, Social and Cultural Rights clarified the obligations of states in the context of the realization of the right to food. As put forward in General Comment 12, the right to food identifies three kinds of obligations of states: not to adopt measures that would prevent access to food; to adopt measures to ensure that no individuals are deprived of access to adequate food; and to proactively engage in activities that strengthen people's access to food, including means to ensure their livelihood and food security. There is also an obligation of states to fulfil that right directly, when people cannot obtain adequate food through the means at their disposal (or, normal entitlements) (Charlotte McClain Nhalpo, 2004).

In India, following the case filed by the People's Union for Civil Liberties (PUCL), the Supreme Court has passed a number of judgments and orders on realizing the right to food (see Appendix on Right to Food for details). These include orders to implement the Mid-Day Meals Scheme (MDMS) in primary schools in all states, the provision of work, etc. Consequently, it is in the context of the international and national obligations, following the acceptance of the right to food, that this Report looks at the ways to realize food security.

1.2 Structure of the Report

This report is an effort to provide a district level profile of food security in Maharashtra. As the country moves towards greater devolution and decentralization, data at disaggregated levels remains a stumbling block. District level data is notoriously inadequate and this report urges that greater attention be paid to data collection and dissemination at sub-state levels. While Chapter 1 introduces the concept of food security, Chapter 2 provides an overview of the state and places it in the context of

other states in the country. In line with the current and correct approach that emphasizes outcomes rather than inputs, Chapter 3 derives a composite index of food security outcomes and provides a brief methodological note. It draws a distinction between the Food Security Outcome Index (FSOI) that is based on outcome measures on the one hand, and the Food Security Index (FSI) that is a composite index of the factors that are critical to food security on the other hand. Chapters 4 to 6 analyze the food security situation along the dimensions of availability, access and absorption. The most food insecure districts both in terms of outcomes and in terms of the factors that contribute to it are discussed in Chapter 7. This chapter also discusses strategies for action that emerge from our analysis, in the context of the broader state and national strategic interventions already in place. This is most significant from the perspective of policy. Chapter 8 wraps up with the final conclusions.

*****

2. A Profile of the State of Maharashtra

An overview of the socio-economic profile of the state and the important changes that have taken place in its economy are important to understand and map the multiple dimensions of food security in Maharashtra. This chapter highlights the geographical features of the state, and discusses its relative position in key areas of the economy.

2.1 Agro-Ecological and NSS Regions

Maharashtra is India's third largest state in area and second largest in population. As per the Census Projection 2006, Maharashtra has a population of more than 111 million in 2010, with a density of 361 persons per square kilometers. Maharashtra is divided into thirty-five districts, which are grouped into six official revenue divisions of the state government: Aurangabad, Amravati, Konkan, Nagpur, Nashik and Pune (Map 2.1).

Maharashtra forms 6 NSS regions, thus making it possible to utilize region-wise data, as is possible with most other states (see Map 2.2).

The NSS regions largely coincide with agro-ecological regions in Maharashtra. However, some districts contain more than one agro-ecological region, for instance, Thane, which includes both a coastal belt and a hill region which is part of the Western Ghats.

The state can be divided into four agro-ecological regions:

- **The Coastal Region**, in the districts of Thane, Raigarh, Ratnagiri and Sindhudurg. This is a region of plains with plentiful monsoon rain and hot and humid climate. These are part of the NSS Coastal Region.

- **The Western Ghat region** of high hills and high rainfall. This adjoins the Coastal Region in the same districts. These are also part of the NSS Coastal Region.

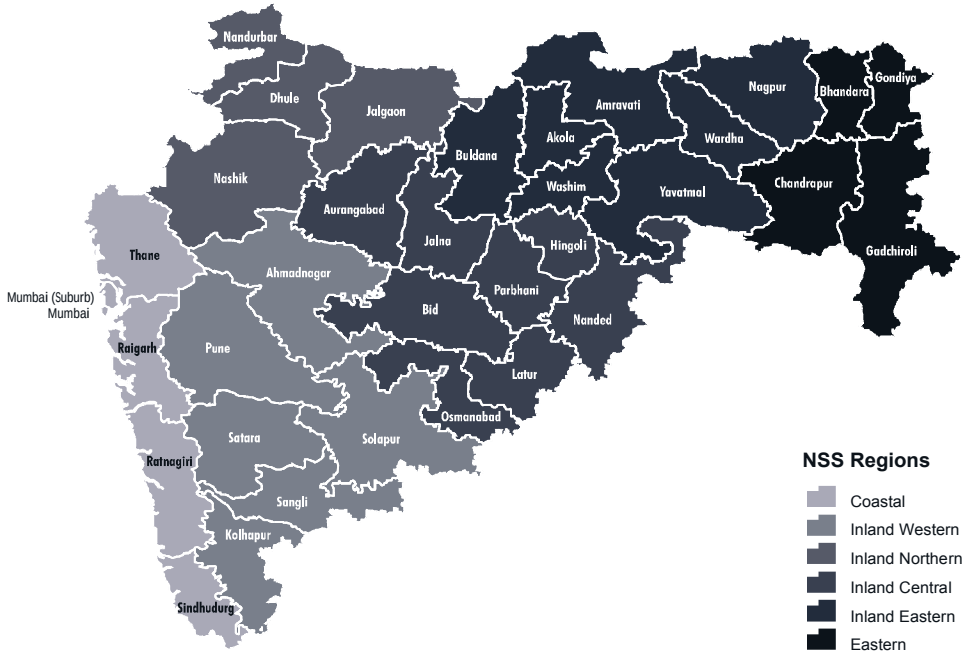
- **The Deccan Plateau,** a hot and semi-arid eco-region. This largely falls in the rain-shadow of the South-west monsoon, consequently receiving little and variable rainfall. Much of the area has black soil. The Deccan Plateau itself is sub-divided into the South-west, Central, Southern and Eastern Plateaus. These largely correspond with the Inland Western, part of the Inland Northern, the Inland Central and most of the Inland Eastern NSS regions.

- **The Central Highlands,** hills, hot and sub-humid. This is sub-divided into the Satpura and Eastern Maharashtra Plateau, the Vindhyan Scarpland and the Satpura and Wainganga Valley. This includes part of the Inland Northern and most of the Eastern NSS regions.

The Inland Central NSS Region is known as Marathwada, and was part of the pre-1947 Hyderabad State; while the Inland Eastern NSS Region is known as Vidarbha, and was part of Madhya Pradesh erstwhile central province. The northern part of the Inland Northern, the Western Ghat of the Coastal

Map 2.1: Maharashtra: Administrative Divisions

Map 2.2: Districts by NSS Regions in Maharashtra



Region and the districts of Gadchiroli and Chandrapur in the Eastern Region, are the areas of concentrated *adivasi* (tribal) populations. They are, as pointed out earlier, largely hill-forest regions. The Inland Western and Coastal NSS Regions are together called Western Maharashtra, and were part of the erstwhile Bombay Province.

2.2 Poverty

Maharashtra is one of the developed states in India. At more than Rs. 15,000 a year, the per capita income of the state is the second highest in the country, (Table 2.1) after Punjab, among the 17 major states.[1] In terms of NSDP, Maharashtra ranks first across all the states. Almost 30 percent of the state's rural population lives below the poverty line, which is marginally higher than the all-India figure (28.3 percent).

However for the Scheduled Tribes (STs) and *dalits* (SCs), the incidence of poverty in Maharashtra is

Table 2.1: Net State Domestic Product (NSDP) and Rural Poverty Status

State	NSDP (TE 2004-05)		Per Capita Income (TE 2004-05)		Poverty Ratio (2004-05)	
	('000 Million Rs.)	Rank	(Rs.)	Rank		Rank
Andhra Pradesh	911	5	11080	8	11.2	2
Assam	181	17	6281	15	22.3	8
Bihar	320	14	3609	17	42.1	15
Chhattisgarh	309	15	7678	12	40.8	14
Gujarat	835	7	14850	4	19.1	6
Haryana	349	13	14897	3	13.6	4
Jharkhand	218	16	7273	14	46.3	1
Karnataka	703	11	12563	6	20.8	7
Kerala	811	9	11565	7	13.2	3
Madhya Pradesh	835	7	7666	13	36.9	13
Maharashtra	2,951	1	15567	2	29.6	11
Orissa	461	12	5985	16	46.8	17
Punjab	723	10	15611	1	9.1	1
Rajasthan	888	6	8788	11	18.7	5
Tamil Nadu	1,511	4	12719	5	22.8	9
Uttar Pradesh	1,876	2	8809	10	33.4	12
W. Bengal	1,705	3	10992	9	28.6	10

Source: NSDP and Per capita Income: Computed from CSO, Various years; Poverty Ratio – Planning Commission Poverty Estimates, Computed from NSS 61st Round, 2004-05.

1. Major states have been defined as those states with a total population of 20 million or above. In all analyses only the major states with this criterion have been discussed, unless otherwise specified.

Table 2.2: Percentage Poverty Rates by Social Group for Rural Maharashtra (2004-05)

Region	ST	SC	OBC	Others	All*
Maharashtra	56.3	44.8	24.1	18.6	29.6
All-India	44.7	37.1	25.8	17.5	28.1

Source: Calculated from unit level data, NSS 61st Round, 2004-05, based on URP.

substantially higher, at 56.3 percent and 44.8 percent respectively, compared to the all-India figures of 44.7 percent and 37.1 percent, respectively (Table 2.2). Rural STs and SCs, constitute 28.4 percent of the rural population, which account for almost half (48.8 percent) of the rural poor in the state. The higher figure for poverty among Scheduled Castes in Maharashtra is somewhat surprising, given the high level of political assertion by them in Maharashtra, which has a history stretching back to Ambedkar, and the Republican Party right to the Dalit Panthers of the 1970s and 80s.

Literacy in Maharashtra is consistently higher than the all-India average (Table 2.3). This is so even for the poor and poor women; for the latter literacy is 55.4 percent as against the all-India figure of 42.2 percent. However, the literacy for poor women (55.4 percent) is almost 20 percentage points below than that for poor men (74.7 percent).

Table 2.3: Literacy Rate for Individuals from Poor and All Categories by Gender for Rural Maharashtra 2004-05

Region	Male		Female		Person	
	Poor	All	Poor	All	Poor	All
Maharashtra	74.7	84.0	55.4	63.2	64.7	73.7
All-India	65.3	76.4	42.2	53.2	53.7	65.1

Source: Calculated from NSS 61st round, 2004-05.

For agricultural labourers, their share in the rural poor is much higher than their share of the population. For all other occupational categories it is less than their respective shares in the population. Labourers, both agricultural and non-agricultural, together account for almost 70 percent of the rural poor, while they are less than 50 percent of the rural population (Table 2.4). The bulk of the rural poor is concentrated among the labourers. Given the renowned success of Maharashtra's Employment Guarantee Scheme (EGS), what this could mean is that this state-provided employment while beneficial, has perhaps not been sufficient to pull agricultural labourers out of poverty.

What is interesting is that the proportion of agriculturists cultivating more than 0.41 hectares of land is more than at the All-India level and, at the same time, the incidence of poverty among these larger land cultivating agriculturists is also higher than at the All-India level (Table 2.5). This points to the lower productivity of agriculture in Maharashtra compared to the All-India productivity.

Table 2.4: Percentage Share of Poor and All Households by Household Type for Rural Maharashtra (2004-05)

Region	Self-employed in Non-agriculture	Agricultural labour	Other labour	Self-employed in agriculture	Others	Total
Poor Households						
Maharashtra	7.2	60.4	9.4	19.2	3.8	100.0
All-India	12.8	41.5	12.1	26.5	7.1	100.0
All Households						
Maharashtra	10.0	37.8	9.5	31.1	10.9	100.0
All-India	15.6	26.7	10.7	35.5	11.4	100.0

Source: NSS 61st Round, 2004-05.

Table 2.5: Percentage Share of Poor and All Households by Land Cultivation Categories for Rural Maharashtra (2004-05) (Ha)

Regions	0.000-0.004	0.005-0.40	0.41-1.00	1.01-2.00	2.01-4.00	4.01 & above	Total
Poor Households							
Maharashtra	52.3	10.5	17.1	11.4	6.3	2.5	100.0
All-India	46.1	23.7	16.9	8.6	3.8	0.9	100.0
All Households							
Maharashtra	45.7	10.6	14.8	14.3	9.6	5.0	100.0
All-India	41.7	19.4	17.7	11.6	6.7	2.9	100.0

Source: Calculated from NSS 61st round, 2004-05.

2.3 Economy

The sectoral composition of the economy is a good indicator of the level of economic development of the state. The performance of the tertiary sector of Maharashtra is quite fair and it draws more than half of its income from this sector, which is seven percent points higher than the national average. The performance of the state in the secondary sector is also better that the national average. The tertiary and secondary sectors together contribute more than 85 per cent of the NSDP. However, it lags behind in the primary sector and ranks last among the major states of the country (Table 2.6).

2.3.1. Role of Agriculture in Maharashtra Economy

In line with the trends in other states, there has been a decline in the contribution of the primary sector, mainly agriculture including fisheries and forestry, to GSDP, from 42.14 percent in 1960-61, to 29.86 percent in 1970-71 to just 17.44 percent in 1999-2000 (Govt. of Maharashtra, 2002, p. 38).

Table 2.6: Sectoral Composition of NSDP* (TE 2004-05)

State	Primary	Rank	Secondary	Rank	Tertiary	Rank
India	**23.33**		**23.61**		**53.06**	
Andhra Pradesh	28.31	11	20.3	11	51.39	6
Assam	39.27	3	12.57	16	48.16	7
Bihar	43.19	1	9.55	17	47.26	8
Chhattisgarh	35.37	7	24.97	8	39.66	15
Gujarat	20.45	14	34.15	1	45.41	12
Haryana	28.96	10	25.04	7	46.01	10
Jharkhand	39.67	2	32.26	2	28.07	17
Karnataka	21.11	13	25.56	4	53.33	5
Kerala	17.55	15	19.44	13	63.01	1
Madhya Pradesh	34.23	8	23.25	9	42.52	14
Maharashtra	14.27	17	25.31	6	60.42	2
Orissa	38.8	5	14.01	15	47.19	9
Punjab	39.01	4	21.5	10	39.49	16
Rajasthan	29.11	9	25.4	5	45.49	11
Tamil Nadu	14.85	16	28.64	3	56.51	3
Uttar Pradesh	36.86	6	19.56	12	43.59	13
West Bengal	25.36	12	19.09	14	55.55	4

** Net State Domestic Product (NSDP) at Factor Cost at 1993-94 prices.*
Source: Computed from Central Statistical Organization (Various Years).

But the proportion of work force in the primary sector has declined much less: It was 72.07 percent in 1960-61, but still remained as high as 61.51 percent in 1999-2000. As a result, the relative product per worker (share of sector in output to share in workforce) in the primary sector declined from 0.58 in 1960-61 to just 0.37 in 1990-91.

Workers are defined as those in Principal Status. Taking both Principal and Subsidiary Status, as done in Table 2.7 does not make any difference to the picture. Agriculture accounts for just 11 percent of GSDP but engages 55 percent of the workforce. This, as is the case with most other states, is a key aspect of the problem of food security for the rural poor. The growth rate of agriculture in Maharashtra only reiterates this story of stagnation in primary sector production. In the period 1994-2005, agriculture grew at just 1.27 percent (see Table 4.1)

Thus, there has been little structural change in the rural economy. The population dependant on agriculture has decreased very slightly. Further, there is a social dimension to this transition. There is a lower proportion of rural persons from the SCs and STs, particularly the STs, with non-agricultural sources of income.

Table 2.7: Percentage Share of Workforce and GSDP by Sub-Sector in Maharashtra, 2004-05 (at 1993-94 Prices)

Sector	Workers %		GSDP %
	UPS	UPSS	GSDP
Agriculture, etc.	55.17	55.74	11.14
Mining & Quarrying	0.42	0.41	0.79
Primary	**55.60**	**56.15**	**11.93**
Manufacturing	11.67	11.78	22.17
Electricity, Gas & Water supply	0.30	0.28	2.44
Construction	4.98	4.87	4.61
Secondary	**16.95**	**16.93**	**29.22**
Trade, Hotel & Restaurants	11.01	10.80	14.53
Transport, Storage & Communication	4.71	4.51	14.44
Finance, Business, Real Estate, etc	2.82	2.80	17.74
Public Admn., Health, Education, etc.	8.92	8.81	12.15
Tertiary	**27.46**	**26.92**	**58.85**
Total	100.00	100.00	100.00

Source: Computed from CSO.

2.4 Health and Nutritional Status

It is a well known fact that a healthy person has a higher capacity to work. The goal of any economic activity is human well-being, an important. component of which is health. Health and nutritional status can be measured through a number of indicators. While mortality under age one [infant mortality] is an indicator of poor reproductive health facilities, antenatal care and post-natal care, mortality under age five is closely linked with immunization and overall poverty levels. The latter is also useful for assessing both social practices and public policy and can be taken as a comprehensive indicator for the overall quality of life.

In terms of nutritional indicators, Maharashtra has a better picture in case of proportion of underweight children (37 percent) in comparison to the other states and the national average. The other mortality and nutritional indicators for children also show a better position in comparison to the national average and to the other major states. However, the nutritional indicator in case of women in Maharashtra is an indicator which invites attention. The proportion of thin women in Maharashtra is higher than the national average and also higher than other states like Uttar Pradesh (Table 2.8).

While infant mortality can be reduced with improvements in access to healthcare, the presence of trained birth attendants etc., reduction in child mortality is more related to improvements in food security

Table 2.8: Mortality and Nutritional Status of Children and Women[2] (2005-06)

	Under-five mortality	Infant Mortality	Under-weight Children	Wasted Children	Stunted Children	Anemic Children	Thin Women
India	74.3	57	42.5	19.8	48.0	69.5	35.6
Uttar Pradesh	96.4	72.7	42.4	14.8	56.8	73.9	36.0
Madhya Pradesh	94.2	69.5	60.0	35.0	50.0	74.1	41.7
Jharkhand	93.0	68.7	56.5	32.3	49.8	70.3	43.0
Orissa	90.6	64.7	40.7	19.5	45.0	65.0	41.4
Chhattisgarh	90.3	70.8	47.1	19.5	52.9	71.2	43.4
Rajasthan	85.4	65.3	39.9	20.4	43.7	69.7	36.7
Assam	85.0	66.1	36.4	13.7	46.5	69.6	36.5
Bihar	84.8	61.7	55.9	27.1	55.6	78.0	45.1
Maharashtra	46.7	37.5	37.0	16.5	46.3	63.4	36.2
Best State	*16.3 (Kerala)*	*15.3 (Kerala)*	*22.9 (Kerala)*	*9.2 (Punjab)*	*24.5 (Kerala)*	*44.5 (Kerala)*	*18.0 (Kerala)*
Worst State	*96.4 (UP)*	*72.7 (UP)*	*60 (MP)*	*35.0 (MP)*	*56.8 (UP)*	*78.0 (Bihar)*	*45.1 (Bihar)*

Source: National Family Health Survey III, 2005-06.

and nutritional status specially of women. Social and economic factors determining the access to food, food entitlements, safe drinking water, and so on, all come into play. Consequently, for an analysis of food security, child mortality is a more relevant indicator than infant mortality.

In nutritional status of children (Table 2.9), rural Maharashtra is more or less at the par with all-India level. The proportion of stunted children under 3 years is about the same as the national average, but the proportions of children under 3 years who are underweight or wasted are both much lower for rural Maharashtra. This would mean that there has been some improvement in children's nutrition. This has not affected stunting, which, however, is a long-term, even inter-generational issue.

While rural children in Maharashtra are more or less at the all-India nutritional levels, the same is not the case for rural women in Maharashtra. Of adult rural women in Maharashtra, as many as 43 percent have an incidence of low BMI. This is more than four percentage points of all-India incidence. On the other hand, adult rural men in Maharashtra perform better than adult rural men at the all-India level (See Table 2.10).

2. Only those states have been selected that have under five mortality higher than 80 per thousand live births.

Table 2.9: Nutritional Status of Children (NFHS III)

Variable	NFHS III		
	Total	Urban	Rural
Maharashtra			
Children under 3 years who are			
Stunted (%)	44.0	40.9	46.9
Wasted (%)	17.2	14.9	18.8
Underweight (%)	32.7	27.1	36.8
India			
Stunted (%)	44.9	37.4	47.2
Wasted (%)	22.9	19.0	24.1
Underweight (%)	40.4	30.1	43.7
Point Gap			
Stunted (%)	-0.9	3.5	-0.3
Wasted (%)	-5.7	-4.1	-5.3
Underweight (%)	-7.7	-3.0	-6.9

Source: National Family Health Survey - III, 2005-06.

In overall per capita calorie intake (see Table 2.11) Maharashtra with 1933 kcal per day is a little below the all-India average of 2047 kcal. In protein consumption too Maharashtra with 55.7 gms/day is just below the all-India average of 57 gms/day. But in government programme-related consumption, viz. children given iron supplements and receiving food supplements under the ICDS programme,

Table 2.10: Nutritional Status of Adults – 15-49 years, 1998-99, 2005-06

Proportion of Adults with BMI* below normal (%)	*NFHS III*			*NFHS II*
	Total	Urban	Rural	Total
Maharashtra				
Women	32.6	20.7	43.0	39.7
Men	24.9	17.3	31.8	n.a
India				
Women	33	19.8	38.8	36.2
Men	28.1	17.5	33.1	n.a

Source: NFHS II and III.

Table 2.11: Status of Consumption

	Per Capita per Day Intake of Calorie (kcal)	Per Capita per Day Intake Protein (gm)	% given Vitamin A supplements in last 6 month (Children < 5yrs)	% given iron supplements in last 7 days (Children < 5yrs)	% Received food supplements under ICDS Programme
India	2047	57.0	18.2	4.7	26.3
Uttar Pradesh	2200	65.9	6.1	1.5	14.7
Madhya Pradesh	1929	58.8	14.1	3.5	36.4
Jharkhand	1961	51.2	20.1	3.5	36.5
Orissa	2023	48.3	21.9	5.2	52.5
Chhattisgarh	1942	47.4	9.1	3.1	58.4
Rajasthan	2180	69.6	10.0	1.0	17.3
Assam	2067	52.7	12.9	0.8	28.0
Bihar	2049	57.8	26.4	2.9	4.2
Maharashtra	1933	55.7	25.2	7.1	42.4
Best State	*2240 (Punjab)*	*69.6 (Haryana)*	*38.5 (TN)*	*12.5 (Karnataka)*	*58.4 (Chhattisgarh)*
Worst State	*1842 (TN)*	*44.9 (TN)*	*6.1 (UP)*	*0.8 (Assam)*	*4.2 (Bihar)*

Source: Calorie and Protein intake from NSSO, 61st Round (2004-05); Rest – National Family Health Survey, 2005-06.

Mahrashtra fares much better than the all-India average. However, it should be noted that in the case of children receiving food supplements under the ICDS, Chhattisgarh with 58.4 percent is much above Maharshtra's 42.4 percent.

*****

3. Analysis of Food Security

Food security is the condition of sufficient nutrition, which is due to a combination of food access of the household and the individual, and of the ability of the body to absorb nutrients. In more detail, food security of an individual is the result of:

1. Food availability, which refers to the quantity of food available, whether through own production or from the market and government programmes. In India food availability is usually measured with respect to foodgrains, which are the chief source of energy particularly of the poor.

2. The food accussed by the household through own production, market purchase and government entitlments and distributed among household members on the basis of various social norms and bargaining positions, including gender relations among the household members.

3. The food consumed by an individual translated into nutrition on the basis of access to safe water, the absence of parasitic diseases, and the overall health status, all of which would affect the body's capacity to absorb consumed food.

3.1 Measuring Food Security Status

Given this definition of food security, how can its attainment be measured? Food security is a combination of access to food and its absorption by the body, which depends on a number of factors such as sanitation, access to clean drinking water, access to health facilities, and so on. The outcome of food security can be taken to be 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, poor quality of diet lack of appropriate care and inequitable distribution of food within the household. The measurement of the nutritional status of children is done through anthropometric methods; these include weight-for-age, height-for-age and weight-for-height. Each of these indices provides somewhat different information about the nutritional status of children. The height-for-age index measures linear growth retardation. Children who are more than two standard deviations below the median of the reference population in terms of height-for-age are considered short for their age or 'stunted'. The proportion in this category indicates the prevalence of 'chronic under-nutrition', which often results from a failure to receive adequate nutrition over a long period of time or from chronic or recurrent diarrhoea (NFHS, 2007).

The weight-for-height index examines body mass in relation to body length. Children who are more than two standard deviations below the median of the reference population for the same index are considered too thin or 'wasted' and this indicates prevalence of acute under-nutrition. Wasting is associated with the failure to receive adequate nutrition in the period immediately before the survey and may be the result of seasonal variations in food supply or recent episodes of illness (NFHS, *op cit*).

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 the proportion of underweight children as the indicator for capturing malnutrition among children. Primarily because weight-for-age takes into account both chronic and acute under-nutrition. Secondly, while information on stunting and wasting are available at the state-level from the NFHS, the same is not available at the district-level. The Reproductive and Child Health Survey through its District Level Household Survey (DLHS) does give information at the district level but only for the index on weight-for-age. Therefore, we have selected this index as one of the two indicators for measuring food insecurity status.

Malnutrition in children weakens their immune system, making them more susceptible to disease and less able to fight off infection. It has been estimated that a child is almost ten times more likely to die from key diseases if he/she is severely underweight, and two and a half times more likely to die if he/she is moderately underweight, as compared to an average weight child (Black et al., 2008). Given the fact that more than 3.5 million children die globally on account of under-nutrition, it emerges as a major factor leading to child deaths.

Therefore, under-five mortality has been taken as the second indicator for measuring food insecurity. The under-five mortality rate indicates the probability of dying between birth and five years of age, expressed per thousand live births. There are a number of advantages of using the under-five mortality ratio as an indicator of food insecurity. Under-five mortality is known to be the 'outcome' of the development process rather than an 'input', such as per capita calorie or protein consumption or access to medical facilities which are means to an end. Under-five mortality is known to be the outcome of a wide variety of factors, for instance, nutritional status of the child and its mother, food availability in the family, level of immunization, availability of maternal and child health services, economic status, availability of safe drinking water, basic sanitation, and so on (UNICEF, 2005). Thus, under-five mortality encompasses a number of facets, most of which have been used as explanatory indicators, as already enumerated and as discussed later.

The significance of under-five mortality as an indicator lies in the fact that it is less susceptible to the fallacy of averages than, for instance, per capita income. This is because the natural scale does not allow children of the rich to be 1000 times as likely to survive, even if the human-made scale does permit them to have 1000 times as much income. To put it simply, it is much more difficult for a wealthy minority to affect a region's under-five mortality ratio, and therefore it puts forward a more accurate picture of the health and nutritional status of the children of that region (UNICEF, 2007a).

The UN explicitly mentions reduction of child mortality (children under five) by two-thirds by 2015 as one of its primary MDGs (MDG–4). The interrelation between nutritional status and under-five mortality can be gauged from the fact that under-nutrition contributes up to 50 percent of all child deaths (WHO and UNICEF, 2006). Improving nutrition and achieving MDG–1 (eradicate extreme poverty and hunger) would substantially help avert child deaths from diarrhoea, pneumonia, malaria, HIV, or measles. Thus, improving nutritional status is a prerequisite for achieving MDG–4 (UNICEF, 2006).

Box 3.1: Towards MDG - 4

India accounts for 2.1 million (21 percent) of a total of 9.7 million children dying globally before they reach the age of five. This is despite the fact that child mortality has declined by 34 percent between 1990 and 2006. A study conducted by Save the Children, which compares child mortality in a country to its per capita income, shows that India lags far behind its poorer neighbours like Bangladesh and Nepal, when it comes to reducing child deaths. A new Wealth and Survival Index, which is part of the study, has ranked 41 countries on the criterion of how well they use their resources to boost child survival rates. While Bangladesh and Nepal are listed in the top ten performers, India stands at a low 16th in the index.

This can be elucidated by comparing India and Bangladesh. While India's per capita income (GNI) increased by 82 percent from 2000 to 2006, its child mortality rate declined from 94 to 76 per 1000 live births. As against that, over the same period, Bangladesh saw a much smaller increase in per capita income – only 23 percent – but its child mortality dropped from 92 to 69.

As per the estimates of the Inter-Agency Group for Child Mortality Estimation, only seven of the 60 priority countries with high child mortality can be considered to be on track to achieve the MDG-4 (Bangladesh, Brazil, Egypt, Indonesia, Mexico, Nepal and the Philippines). Thus, the global progress made so far has been found to be insufficient to achieve the goal. To actually achieve the goal, most of the remaining countries have to progress at an average annual rate of reduction of at least 10 percent till 2015. Given the fact that the global rate so far (1990-2006) has just been a little over 1.5 percent, the achievement of this goal seems to be unrealistic.

The *State of the World's Children-2008* suggests early and exclusive breastfeeding for the first six months, appropriate complementary feeding from six months to two years, skilled care at birth and special care for low-birth weight babies as key preventive measures to reduce child mortality. Thus, adequate food security of the child is necessary for its survival beyond the age of five.

Ref: UNICEF (2007b), Save the Children (2008).

As many as 60 countries across the globe have been prioritized for urgent action, based on two criteria: countries with more than 50,000 deaths of children under five and countries with an annual under-five mortality of at least 90 per 1000 live births. In 2005, these 60 countries accounted for 93 percent of all deaths of children under five. India figures prominently among these countries and shares place along with four other South Asian countries. Regrettably, India does not appear to be on track to achieve the MDG–4 (UNICEF, 2006) (See Box 3.1).

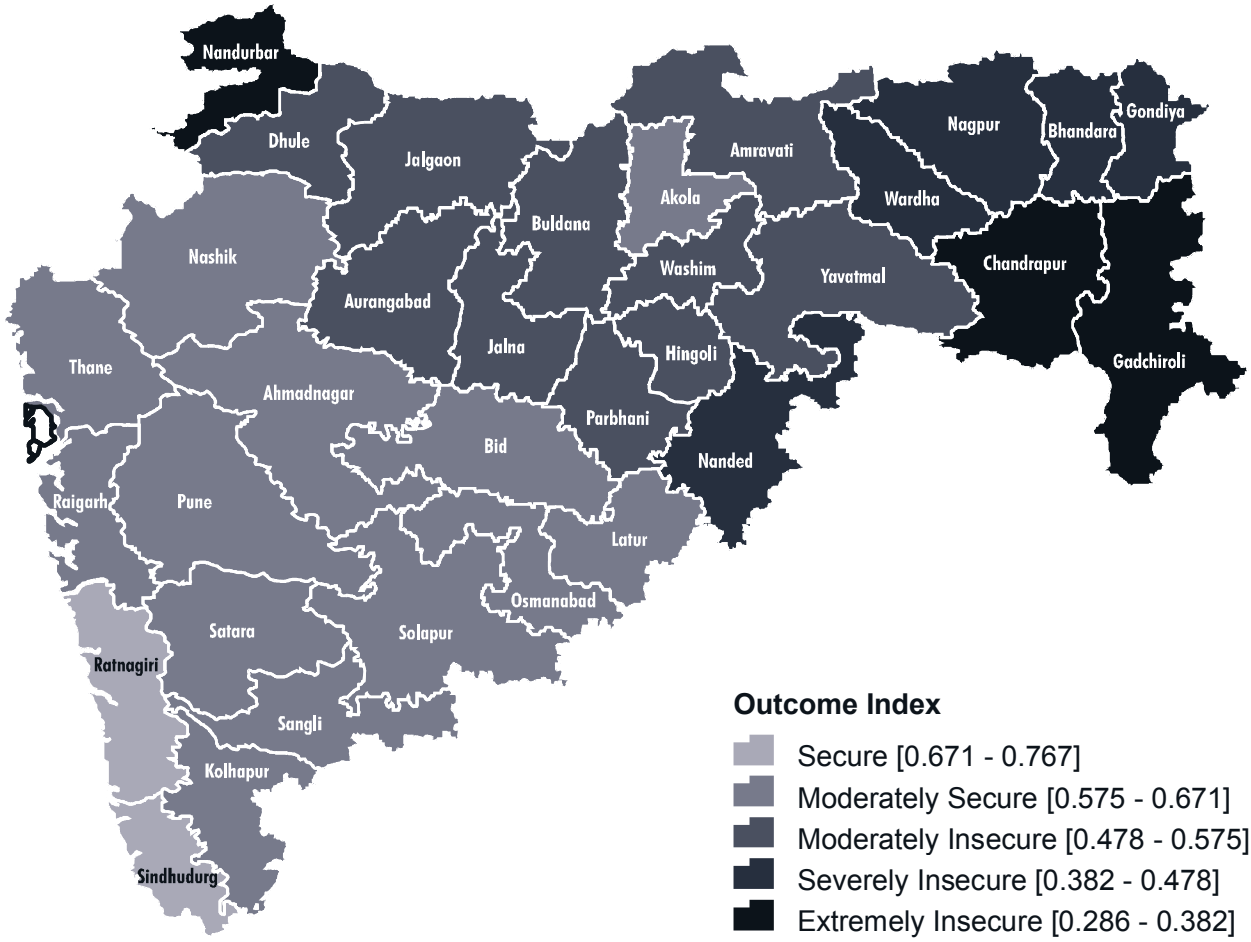
Table 3.1: Correlation between Micronutrient Intake and Under-nutrition and Mortality Status

	Under 5 Mortality	Underweight Children	Vitamin Intake	Iron Intake
Under 5 Mortality	1.00	0.714**	- 0.501**	- 0.523**
Underweight Children		1.00	- 0.227	- 0.450*
Vitamin Intake			1.00	0.555**
Iron Intake				1.00

*** Correlation significant at 0.01 level* ** Correlation is significant at 0.05 level*

Source: Calculated from NFHS III & NSS 61st Round Data.

Map 3.1: Food Security Outcome Map of Maharashtra



A statistical analysis of the NFHS–3 data across states reveals a significant negative correlation between micro-nutrient intake and proportion of underweight children and under-five mortality, implying thereby that an increased intake of micronutrient, significantly reduces the risk of under-nutrition, which in turn, as discussed, contributes to reduction in under-five mortality (Table 3.1).

It follows from the preceding discussions, that child under-nutrition status and mortality appear to be an overall outcome of nutritional and food insecurity. It, therefore, makes sense to form a combined index of these two indicators to compute an overall index of food security outcome in Maharashtra (see Table 3.2). Districts have been divided into five groups on the basis of this index – secure, moderately secure, moderately insecure, severely insecure, and extremely insecure – each category representing the relative severity of the outcome of food insecurity (Table 3.2 and Map 3.1).

Table 3.2: Food Security Outcome Index (FSOI) Status

Secure District	Moderately Secure District	Moderately Insecure District	Severely Insecure District	Extremely Insecure District
Sindhudurg	Satara	Parbhani	Bhandara	Nandurbar
Ratnagiri	Thane	Hingoli	Gondiya	Chandrapur
	Kolhapur	Aurangabad	Nagpur	Gadchiroli
	Pune	Washim	Nanded	
	Osmanabad	Yavatmal	Wardha	
	Raigarh	Jalgaon		
	Sangli	Jalna		
	Bid	Dhule		
	Solapur	Amravati		
	Akola	Buldana		
	Ahmadnagar			
	Latur			
	Nashik			

The hill-forest districts of Nandurbar, Chandrapur and Gadchiroli fall in the extremely insecure category. Districts in the secure category are mostly from Western Maharashtra, including the coastal districts. But what is important to note is that almost all the districts of both Vidarbha and Marathwada fall within the insecure categories. There is a vast belt of the Deccan Plateau, the unirrigated districts of Vidarbha and Marathwada that are among the worst-performing regions of Maharashtra in nutritional outcomes.

3.2 Explaining Food Security

Taking the child mortality and child malnutrition rates as the outcomes of food security, one could rank districts on the basis of this index, as done above. If the objective of the exercise were merely

Table 3.3: Indicators used to Compute Food Security Outcome Index (FSOI)

	Under-five Mortality		Underweight Children		Food Security Outcome Index	
	Value	Rank	Value	Rank	Value	Rank
Ahmadnagar	66.1	12	40.2	7	0.577	13
Akola	64.2	11	51.2	15	0.601	12
Amravati	93.1	29	55.9	22	0.485	24
Aurangabad	74.5	19	50.6	14	0.553	18
Bhandara	103.3	30	51.2	15	0.477	26
Bid	62.6	10	50.4	13	0.604	10
Buldana	71.6	14	58	26	0.483	25
Chandrapur	105.5	31	59.1	30	0.352	32
Dhule	82.6	24	52.4	19	0.494	23
Gadchiroli	116.2	33	61.9	32	0.286	33
Gondiya	113.4	32	57.3	24	0.437	27
Hingoli	78.7	22	58.8	28	0.555	17
Jalgaon	72.3	15	51.4	18	0.521	21
Jalna	83.2	25	55.2	21	0.5	22
Kolhapur	54.4	5	36	3	0.66	5
Latur	73.9	18	51.3	17	0.576	14
Nagpur	81.9	23	46.2	10	0.422	28
Nanded	88.3	26	56.4	23	0.42	29
Nandurbar	92.5	28	67.4	33	0.364	31
Nashik	73.6	17	58.8	28	0.576	14
Osmanabad	69	13	44.5	9	0.637	7
Parbhani	72.3	15	57.3	24	0.574	16
Pune	45	2	34.6	2	0.655	6
Raigarh	61.9	9	39.4	5	0.634	8
Ratnagiri	54.4	5	37	4	0.682	2
Sangli	44.3	1	40.1	6	0.629	9
Satara	45.3	3	34.5	1	0.67	3
Sindhudurg	53.8	4	42.8	8	0.767	1
Solapur	61	8	48.4	11	0.602	11
Thane	57.4	7	48.5	12	0.663	4
Wardha	77.1	21	52.5	20	0.394	30
Washim	76.8	20	58.5	27	0.547	19
Yavatmal	91.5	27	60	31	0.544	20

Source: Underweight Children - RCH-DLHS (2002-04): Under Five Mortality – Computed from Census (1991 and 2001) by F. Ram, Usha Ram and Chander Shekhar for 'Strengthening State Plans for Human Development' (IIPS).

to decide on the districts in which to concentrate food security interventions, then such a ranking would be sufficient. But this would say nothing about the *types* of interventions that should be undertaken in order to improve food security, which is one of the key objectives of the study.

Food security indicators can draw attention to the factors that distinguish the food secure from the food insecure districts. These indicators can point out the specific areas in which the food insecure districts differ the most from food secure districts. Whether it is due to an enhanced women's agency contributing to a better utilization 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 for which significant differences exist. It would even be possible to rank these variables, a rank that would point to the extent to which these variables are different between districts. Such an analysis could also point to variations between food insecure districts – the same variables may not contribute the most to the low index in all districts, or some of them may even move in opposite directions.

Food security is the ability of a household to command food (its food entitlements), generally acquired through the net result of its livelihood activities (plus any other non-livelihood-based entitlements), that is crucial in determining 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 point of the command over food that they 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 public intervention of different kinds. Food production, or agricultural production more broadly, then enters as a 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 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 that 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 own economic attainments. There are also government – or community-based – entitlements. Government-organized entitlements have been gaining in importance, while community-based entitlements have been on decline, even among *adivasis*. The operation of various schemes, such as the Mid-Day Meal Scheme in schools, do have substantial, impact on the access of children, girls and boys, to food. The performance of these schemes depends very substantially on demand from community 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.

It therefore emerges that there are a number of indicators that influence food insecurity in one way or the other. We have combined these indicators into a set of three broad food security indices:

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

3.2.1 Food Availability

The concern for food availability stems from production and related aspects that sustain a desired level of food production. Foodgrains 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). Foodgrains are 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. ***Per Capita Value of Agricultural Production:*** Agricultural output is an indicator reflecting availability of food. Since agriculture is dependent on climate, it is advisable to take an average of three to five years' data of agricultural production to take into account the variability of production. Food and non-food production both would be included since non-food production would contribute to the income of households and therefore have an impact on food security. To account for variations in population across districts, the per capita value of agricultural production has been used.

2. ***Proportion of Forests:*** Forests are a form of common property resource. 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.

3. ***Irrigation Extent:*** Irrigation has a key role in both stabilizing agricultural production and, 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.

4. ***Rural Connectivity:*** 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 realized 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 expenditure on roads, in particular, has been found to have the largest positive impact on productivity growth (Fan, et al., 1999).

3.2.2 Food Access

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 what Amartya Sen calls endowment and exchange entitlements (Sen, 1981).

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

1. ***Proportion of Agricultural Labourers:*** The total number of agricultural workers in the country has been estimated at 259 million as of 2004–05. Of these, more than one-third are wage workers and almost all of these are casual labourers. Agricultural labourers are characterized by extremely poor physical and human capital and also the highest poverty levels (NCEUS, 2007). Thus, it is expected that the proportion of agricultural labourers will be negatively related to food security, i.e., the more the agricultural labourers in a district, the worse will be the food security situation.

2. ***Proportion of Scheduled Tribes and Scheduled Castes:*** The ST and SC households are known to be generally more food insecure, largely on account of their economic and social deprivation – the former on account of geographical marginalization and the latter due to historical deprivation and exclusion from mainstream – all resulting in political marginalization. The proportion of ST and SC population in a district has been taken as an indicator of this marginalization. The assumption is that the greater the ST and SC population in a district the less it will be associated with food security.

3. ***Proportion of Working Age Population:*** 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

1. One of the traits of any developed economy is a lower fertility rate, which leads to a 'bulge' in the working age group, thus improving the dependency ratio (reverse of working age group ratio), making it less than unity.

to the dependent population[1]. This 'demographic dividend', if effectively harnessed, leads to prosperity and hence food security (Chandrasekhar, et al. 2006).

4. ***Per Capita Consumption Expenditure:*** The NSS estimate 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.

5. ***Wage Rate of Rural Persons:*** Casual wage workers constitute about one-fifth of the workers in the unorganized 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 agricultural labour, without the backing of self-produced food, is particularly vulnerable to food insecurity. There is, therefore, a particular concern with the earnings of agricultural labour.

6. ***Rural Female Literacy:*** It is well-known that there are gender-based inequalities in food consumption within a household. Consequently, mere household consumption data or per capita household consumption data would not tell us the story of intra-household distribution of food and related facilities, such as access to medical services, which would affect the nutritional status of females, women and girls. That such gender-based inequalities in household consumption exist is attested to by numerous case studies (see those reviewed in Bina Agarwal, 1994). Further, the very high incidence of anaemia among women and girls shows that females are nutritionally deficient even in households that are not otherwise poor or nutritionally deficient. We have used the rural female literacy rate as the 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 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.

3.2.3 Food Absorption

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.

The following indicators have been chosen to determine a broad picture of food absorption:

1. ***Access to Safe Drinking Water:*** Reduction of the proportion of people without access to safe drinking water by half has been mentioned as part of the seventh Millennium Development Goal. Polluted and contaminated water undermines the safety and the nutritional well-being of individuals. 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 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). Empirical studies have shown that water quality is a big problem in rural areas (Krishnan, et al. 2003). Almost two million children die each year because of lack of clean water and lack of sanitation (UNICEF, 2007c). The availability and quality of potable water is a big factor that affects food insecurity. As there is no direct method for calculating access to safe drinking water, we have considered access to a tubewell, tap and handpump as three ways of acquiring safe drinking water.

2. ***Access to Primary Health Services:*** 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, all the health services are pivoted around the PHCs, hence we have taken access to them as an indicator determining food absorption.

3.3 Food Security Index (FSI)

The FSI is a composite index covering three dimensions, i.e., Availability, Access, and Absorption factors. Districts having higher index value are considered relatively more food secure compared to districts with lower index values. All variables included in the index are for rural areas, unless otherwise specified.

Besides these three groups of factors, an additional component, i.e. public entitlement, has been used to explain how this influences food security. But the public entitlement factor is not included in the index of food security. The reason is that public entitlements enter to make up for deficiencies in normal, private entitlements. The lower the level of food security, the greater should be public entitlement.

For each of the dimensions, as discussed earlier, some relevant variables have been chosen. All indicators used to calculate the composite index should be positively related to the index. In order to

Table 3.4: Indicators Used to Analyse Food Security in Maharashtra

Name of Variable	Sources	Ref. Year
(a) Availability		
1. Proportion of net irrigated area to net sown area	Agricultural Statistical Information, Maharashtra State, 2002 (Part II) Page 3 & 25	1996-97
2. Per capita value of agricultural output	Department of Agriculture, Government of Maharashtra	2002-03 to 2004-05
3. Percentage of inhabited villages having access to paved roads.	Census of India	2001
4. Percentage of forest area to total geographical Area*	Directorate of Agriculture, Government of Maharashtra.	2000
(b) Access		
1. Percentage of agricultural labourers to total workers*.	Census of India	2001
2. Proportion of ST and SC population to total population (Rural)*	Census of India	2001
3. Share of Working Age Population (Rural)	Census of India	2001
4. Monthly per capita consumption expenditure (inequality adjusted)	61st NSS round	2004-05
5. Rural casual wage rate	61st NSS round	2004-05
6. Female literacy rate (7+) (Rural)	Census of India	2001
(c) Utilization		
1. Percentage of households having access to safe drinking water.	Census of India	2001
2. Percentage of inhabited villages having access to Health Services in Rural Areas	Census of India	2001
(d) Public Entitlement**		
1. Percentage of midday meal beneficiaries to total children (6-11 years)	Department of Rural Development, Government of Maharashtra	September, 2006
2. Percentage of ICDS beneficiaries to total project population	Department of Women and Child Development, Government of Maharashtra	May 2007

** These indicators are inversely related to food security. The direction of their indices has been reversed to have a positive association with food security.*

*** These variables are not used for calculation of indices. They are used for analysis of the indices.*

do that, some of the variables have been reversed. Table 3.4 gives the indicators, source of information and the reference year. (See Appendix 2 Table A2.1 for a description of the variables).

*****

4. Food Availability

The concern for food availability stems from production and related aspects that sustain a desired level of food production. Where production is largely for subsistence and is the main source of a household's food entitlement, foodgrain production is of paramount significance for household food and nutritional security. Foodgrains 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 foodgrain 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 which makes, increasing availability of food 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^{o} C) in temperatures (IPCC, 2007). A great deal of research is needed to understand this impact in different states of the country.

This chapter analyses food availability across a number of component dimensions. Broadly these dimensions are production and productivity, extent of irrigation, proportion of forests, and road connectivity. The effort is to compare the overall situation in Maharashtra vis-à-vis other States, and then analyze and map the inter-district disparities. The chapter also shows the position of each district with respect to the selected indicators and the composite index and map of availability.

4.1 Agricultural Growth

Reflecting the deepening agrarian crisis in the country, growth in agricultural Gross State Domestic Product (GSDP) in India declined during the decade 1993-94 to 2003-04 as compared to the preceding decade (see Table 4.1).

While agricultural GDP grew at a very slow rate of about 3 percent during the decade 1983–84 to 1993–94, it came down even further to 2.2 percent in the next period from 1993–94 to 2003–04. In the same period, the disparities among the states also widened. The coefficient of variation in the growth of agricultural GDP, which is a measure of the disparities among states, increased significantly from 59 to 103 over the two periods. At the same time, there was a decline in the variation across states in the growth of overall GDP (Table 4.1).

Maharashtra witnessed a positive growth of 5.39 percent in agricultural GSDP during 1983-84 to 1993-94. However, it witnessed a decline during 1993-94 to 2003-04 (largely on account of a high base). Similarly, the growth rate of GSDP has also declined during the same period.

Table 4.1: Growth of Agricultural GDP and GSDP across States

State	1983-84 to 1993-94 (at 1980-81 Prices)		1993-94 to 2003-04 (at 1993-94 Prices)	
	Agricultural GSDP	GSDP	Agricultural GSDP	GSDP
Andhra Pradesh	3.05	4.58	2.80	5.63
Assam	2.12	3.51	0.51	2.93
Bihar	-0.45 ***	2.69	2.50	5.34
Gujarat	0.84 ***	5.00	1.13 ***	6.19
Haryana	4.86	6.18	1.77	5.96
Himachal Pradesh	3.08	5.89	1.30	6.53
Jharkhand			4.25	4.28
Karnataka	3.54	5.86	3.12	7.10
Kerala	4.40	5.33	-2.00 *	4.85
Madhya Pradesh	2.82 *	5.21	0.23 ***	4.14
Maharashtra	5.39 *	7.42	1.27	4.92
Orissa	-0.57 ***	3.39	0.17 ***	3.96
Punjab	4.62	5.13	2.15	4.13
Rajasthan	3.93	6.19	1.21 ***	5.32
Tamil Nadu	4.43	7.45	-0.60 ***	5.08
Uttar Pradesh	2.8	4.66	2.18	3.76
West Bengal	4.45	4.73	3.45	7.03
India	3.05	5.32	2.19	6.01
CV for States	58.72	25.43	102.88	22.75

Note:Growth is Compound Annual Growth Rate. GSDP denotes Gross State Domestic Product. All growth rates are significant at 5 per cent, but for * which is significant at 10 per cent and *** *which is insignificant even at 20 per cent. CV denotes coefficient of variation.*

Source: CSO, *Gross State Domestic Product*, Various Years.

4.2. Production

The lower productivity of agriculture, however, is not uniform across the state. There is a clear difference between agriculture in western Maharashtra and the rest of the state. The share of irrigated cropped area has risen from 6.48 percent in 1960-61 to 15.41 percent in 1999-2000. This itself is low in comparison with the all-India average of 33 percent (Government of Maharashtra, 2002, pp. 36-37). Along with this low proportion of irrigated area, most of the irrigated area is concentrated in part of the plains of Western Maharashtra, in its belt of sugarcane cultivation in the Pune Division, for cultivation, and of sugarcane, grapes and other fruits and vegetables around Nashik, and in the coastal Konkan belt.

In most of the plains of Vidarbha and Marathwada cash crops, such as cotton and oilseeds, are grown on a large scale. Being rainfed crops, their yields are subject to the vagaries of rainfall, while prices

are subject to market fluctuations, both factors together resulting in unstable incomes. With a high proportion of debt-financed purchases of agricultural inputs, variations in yield or in market prices often result in debt-induced suicides of farmers, affecting not the poorest but the somewhat better-off farmers. The phenomenon of market-related fluctuations in farmers' income resulting in failure to repay debts and subsequent destitution, has plagued this region from the time of the post-American Civil War (late 1860s) crash in cotton prices and the resulting peasant strife known as the Deccan Riots. Contemporary suicides by debt-strapped farmers show that the problem of social security in market production has not yet been solved.

4.3 Per Capita Value of Agricultural output

Agricultural production (food plus non-food crops) is not only extremely low in the forest-dominated districts (Thane and Gadchiroli) but also along the coast (Ratnagiri and Raigarh). What is surprising

Table 4.2: Level of Agricultural Development

State	% of National Foodgrain Production		Foodgrain Yield (TE 2005-06)		Instability in Foodgrain Production[1]		Cropping Intensity[2]		Irrigation Extent[3]	
	(TE 2005-06)	Rank	kg / ha	Rank	(1991-2005)	Rank	(%)	Rank	(%)	Rank
India	100		1714		9.4		134.4		39.6	
Andhra Pradesh	7.1	4	2155	4	18.9	7	121.7	11	38.1	7
Assam	1.8	15	1437	9	6.2	2	143.1	6	6.2	16
Bihar	4.5	9	1498	8	17.1	6	138.8	7	60.6	4
Chhattisgarh	2.8	14	1107	14	66.6	14	116.9	13	23.1	12
Gujarat	2.9	12	1554	7	43.6	13	113.8	16	31.6	10
Haryana	6.3	7	3087	2	6.5	3	177.5	2	84.0	2
Jharkhand	1.8	16	1265	12	122.4	15	120.3	12	9.3	15
Karnataka	3.6	10	1275	11	28.7	11	116.6	14	24.9	11
Madhya Pradesh	7.1	5	1184	13	23.9	9	128.4	8	33.5	8
Maharashtra	5.4	8	909	16	25	10	127.2	9	16.9	14
Orissa	3.4	11	1334	10	38.5	12	146	5	22.9	13
Punjab	12.2	2	3996	1	5.8	1	185.9	1	95.4	1
Rajasthan	6.6	6	1053	15	229.6	16	123.8	10	33.4	9
Tamil Nadu	2.9	13	1806	6	20.8	8	115.8	15	50.2	6
Uttar Pradesh	19.7	1	2119	5	9	5	153.4	4	73.7	3
West Bengal	7.8	3	2464	3	6.6	4	176.5	3	54.5	5

Source: Ministry of Agriculture, Govt. of India (Various Years).

[1] Instability in production = standard deviation of growth rates of total food grain production (1991-2005)

[2] Cropping Intensity = Gross Area Sown / Net Area Sown (expressed as percentage)

[3] Irrigation Extent = Net Area Irrigated / Net Area Sown (expressed as percentage)

Box 4.1: Agricultural Production and Food Security

It is commonly believed that agricultural production directly affects food security. However, there is more to it than a mere direct link. Rising agricultural productivity increases rural incomes and lowers food prices, making food more accessible to the poor. Improving irrigational facilities and growing drought-tolerant crops reduce income variability by mitigating the impact of drought. Productivity enhancements are key to greater food security for households with limited access to food markets. Nutritionally enriched crops give access to better diets, particularly through biofortification that substantially improves the nutrient content of the crop.

Thus investments in agriculture are important to ensure food security. However, there is an increasing concern about global food security in future, largely consequent upon growing resource scarcity and climate change. In the present world, many countries have diversified their export base, and trade at large stabilizes food availability. However, food availability is still a concern in many agriculture-based countries. Many countries have declining per capita production of food staples. Further, staple crop production in most of these countries is rain-fed and experiences large fluctuations caused by climatic variability.

The increase or even sustenance of the present level of production is limited by a number of factors – land constraints, water scarcity, high energy prices – along with the uncertain effects of climate change, which has been considered to be one of the areas of greatest uncertainties for agriculture. The combined effects of higher average temperatures, greater variability of temperature and precipitation, more frequent and intense droughts and floods and reduced availability of water for irrigation can be devastating for agriculture, particularly in the tropical regions. It has been predicted that agricultural GDP in Sub-Saharan Africa could contract by anywhere from 2 to 9 percent.

Source: World Development Report, 2008

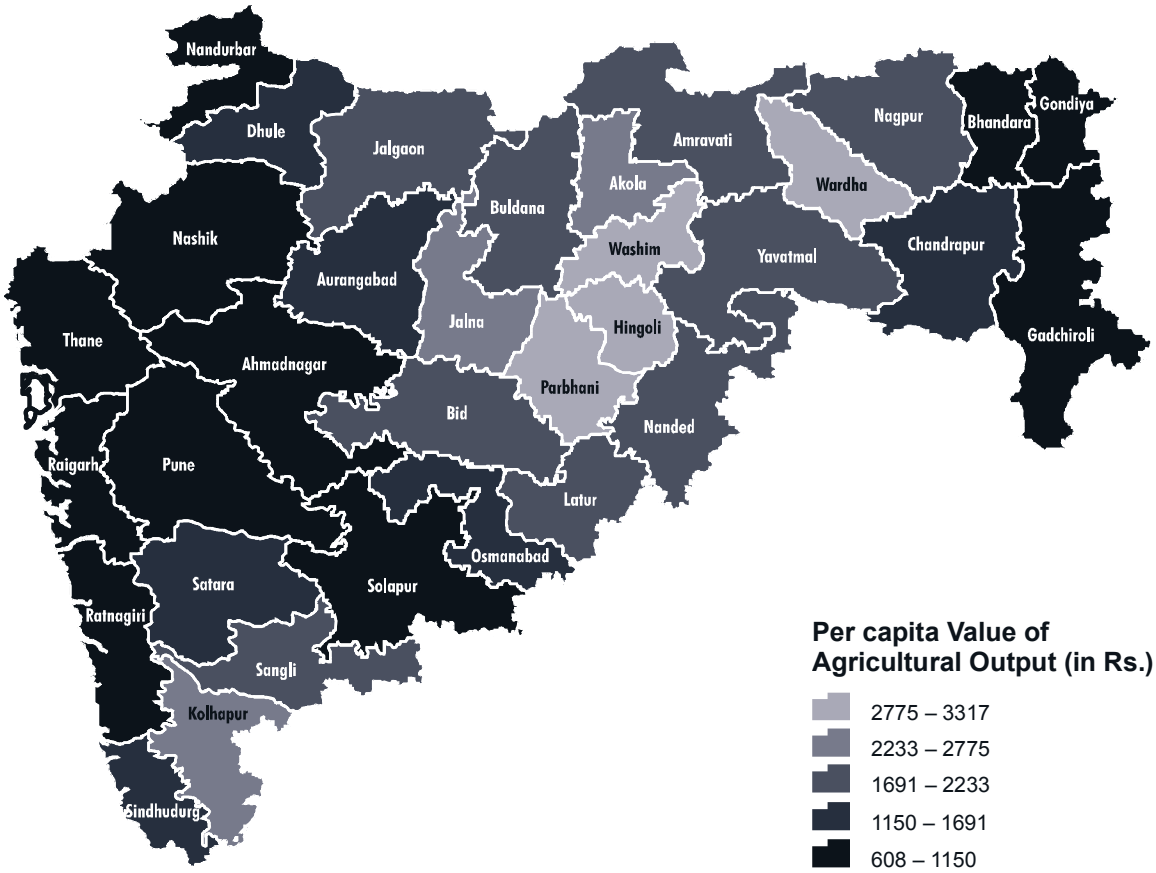
is that Ahmadnagar, Solapur and Nanded, with relatively high irrigation, are in the very low production category, along with Nandurbar. These districts combine irrigation (largely for sugarcane production) in limited parts of the district, along with the rest of the district carrying out rainfed agriculture, producing

Table 4.3: Per Capita Value of Agricultural Output in Maharashtra

District	Value (%)	Rank	District	Value (%)	Rank	District	Value (%)	Rank
Ahmadnagar	865	28	Hingoli	2933	3	Pune	1121	23
Akola	2368	7	Jalgaon	2193	8	Raigarh	841	29
Amravati	1906	11	Jalna	2651	5	Ratnagiri	608	33
Aurangabad	1579	19	Kolhapur	2406	6	Sangli	1753	16
Bhandara	1090	24	Latur	1839	14	Satara	1458	20
Bid	1823	15	Nagpur	1870	13	Sindhudurg	1297	22
Buldana	2120	9	Nanded	1873	12	Solapur	957	26
Chandrapur	1592	18	Nandurbar	1073	25	Thane	609	32
Dhule	1454	21	Nashik	908	27	Wardha	3077	2
Gadchiroli	682	31	Osmanabad	1677	17	Washim	2917	4
Gondiya	817	30	Parbhani	3318	1	Yavatmal	2092	10

Source: As stated in Table 3.4, Variable a2.

Map 4.1: Status of Agricultural Production in Maharashtra



basically low-value food crops with low productivity, such as *jowar* and *bajra*. This dualism in the agricultural economy of these districts could bring down their per capita value of agricultural output (Table 4.3 and Map 4.1).

4.4 Coverage of Irrigation Facilities

Irrigation plays a key role in both stabilising agricultural production as well as increasing the cropping intensity, productivity and employment, improving a districts food security position.

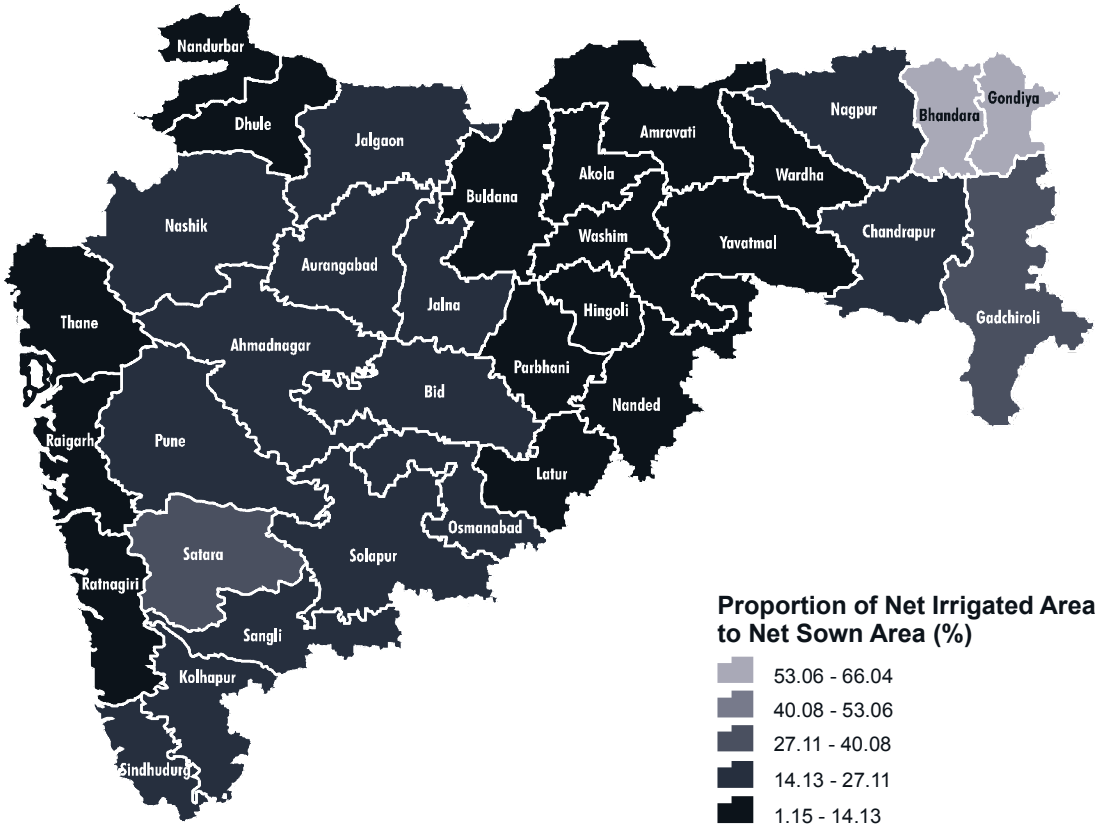
The extent of irrigation is represented by the ratio of the net area irrigated to the net area sown. It is low in most of the districts of Maharashtra. But the districts lying in the Deccan Plateau (the Western part of Vidarbha and Marathwada) have the lowest level of irrigation. This is bound to affect agricultural production per capita (which is an indicator of access to food of farmer households) and hence food security in these districts. The north-eastern districts like Gondiya and Bhandara have good irrigation coverage with more than 2/3rd of their cultivated area being irrigated (Table 4.4 and Map 4.2).

Table 4.4: Extent of Irrigation in Maharashtra

District	Value (%)	Rank	District	Value (%)	Rank	District	Value (%)	Rank
Ahmadnagar	26.55	5	Hingoli	9.32	21	Pune	25.27	9
Akola	3.31	31	Jalgaon	18.10	16	Raigarh	6.05	26
Amravati	8.57	23	Jalna	18.10	16	Ratnagiri	1.15	33
Aurangabad	21.87	13	Kolhapur	26.41	7	Sangli	21.96	12
Bhandara	66.04	1	Latur	7.60	25	Satara	31.12	4
Bid	25.33	8	Nagpur	20.86	15	Sindhudurg	26.53	6
Buldana	5.85	28	Nanded	8.10	24	Solapur	21.79	14
Chandrapur	23.43	10	Nandurbar	12.52	19	Thane	4.63	30
Dhule	12.52	19	Nashik	22.63	11	Wardha	5.83	29
Gadchiroli	32.77	3	Osmanabad	17.64	18	Washim	3.31	31
Gondiya	66.04	1	Parbhani	9.32	21	Yavatmal	5.98	27

Source: As stated in Table 3.4, Variable a1.

Map 4.2: Share of Irrigated Area in Maharashtra



4.5 Forests

Maharashtra has a high proportion of wastelands (see Table 4.5). The state has almost 50,000 sq kms of wastelands and ranks 13th from the bottom out of 17 major states of the country, with only 4 states being worse-off in terms of proportion of wastelands to total area. The barren lands with or without scrubs form the highest proportion of wastelands (60 percent) followed by degraded forests (29 percent). These wastelands are degraded pastures and other commons across the Deccan Plateau. These pastures and commons have low productivity though they do provide some income, food and fodder to the poor (see Jodha 2000 for an analysis of the importance of the commons in semi-arid and arid regions to the poor).

Table 4.5: Environmental Limitations to Agricultural Development

	Per cent of Wastelands to total area		Rainfall Deviation from Norm		Forest Area (per cent)		Agricultural Extent* (per cent)	
	2003	Rank	TE 2004-05	Rank	2003	Rank	TE 2001-04	Rank
Andhra Pradesh	16.46	14	-8.3	11	16.2	9	36.62	13
Assam	17.89	15	6.7	1	35.5	15	35.34	14
Bihar	5.78	5	3.0	3	5.9	5	60.90	5
Chhattisgarh	5.61	4	-1.0	4	41.4	17	34.69	15
Gujarat	10.4	9	-4.3	7	7.6	6	50.83	9
Haryana	7.39	8	-6.0	9	3.4	2	80.48	2
Jharkhand	14.01	12	-5.7	8	28.5	13	22.20	17
Karnataka	7.06	7	-16.0	14	19.0	11	52.00	8
Kerala	4.6	2	-18.0	15	40.1	16	56.37	7
Madhya Pradesh	18.53	16	-8.3	11	24.8	12	33.31	16
Maharashtra	16.01	13	-13.7	13	15.3	8	57.04	6
Orissa	12.17	10	-3.0	6	31.1	14	37.08	11
Punjab	2.33	1	-24.3	16	3.1	1	84.38	1
Rajasthan	29.64	17	-27.0	17	4.6	3	43.74	10
Tamil Nadu	13.3	11	-2.0	5	17.4	10	37.05	12
Uttar Pradesh	7.05	6	-8.0	10	5.9	4	68.97	3
West Bengal	4.95	3	6.0	2	13.9	7	62.50	4
Total	17.45		-7.7		20.6		45.30	

Source: Wasteland – Wasteland Atlas, 2003; Forest – State of Forest Report, 2003; Rainfall and NAS – Ministry of Agriculture
** Agricultural Extent = Net area sown / Total Reporting Area x 100*

Forests are one of the major components of common property resource, which can be considered as a support of rural livelihood for rural households in general and poor in particular. The extent of forest lands in a region has strong linkages with food security in rural areas.

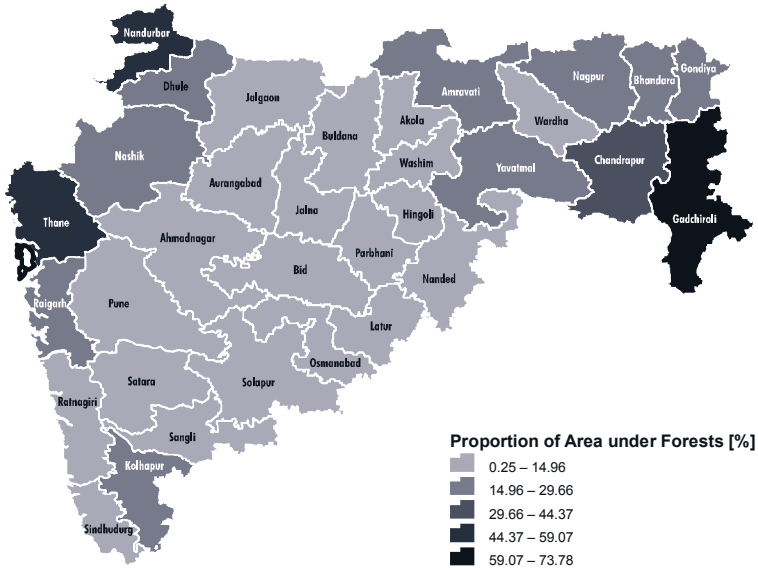
The state has a modest coverage (15.3 per cent) of forests. It ranks eighth among the seventeen major states of the country in terms of forest area. In the country on the whole, about 21 per cent of the total area is under forest cover. The forested districts of Maharashtra are along the borders with Andhra Pradesh (Gadchiroli and Chandrapur) and Madhya Pradesh (Nandurbar and Dhule). The only other district with high forest cover is Thane in the Western Ghats.

Table 4.6: Share of Forest Area in Maharashtra

District	Value (%)	Rank	District	Value (%)	Rank	District	Value (%)	Rank
Ahmadnagar	9.60	19	Hingoli	6.07	24	Pune	10.52	17
Akola	5.53	25	Jalgaon	13.48	15	Raigarh	21.84	9
Amravati	25.38	8	Jalna	0.65	31	Ratnagiri	0.70	30
Aurangabad	7.06	21	Kolhapur	18.96	11	Sangli	5.24	26
Bhandara	28.84	6	Latur	0.25	33	Satara	13.50	14
Bid	2.17	28	Nagpur	18.67	12	Sindhudurg	6.57	23
Buldana	10.81	16	Nanded	8.28	20	Solapur	2.37	27
Chandrapur	35.68	4	Nandurbar	47.63	2	Thane	46.74	3
Dhule	29.11	5	Nashik	20.01	10	Wardha	9.87	18
Gadchiroli	73.78	1	Osmanabad	0.53	32	Washim	6.80	22
Gondiya	28.84	6	Parbhani	1.03	29	Yavatmal	18.06	13

Source: As stated in Table 3.4, Variable a4.

Map 4.3: Share of Area under Forests



The districts of Gadchiroli, Nandurbar and Thane have the highest area under forests, followed closely by Chandrapur. These are also districts with low irrigation coverage and poor agricultural productivity. As we saw earlier, these regions also have a poorer FSO than the rest of the state (Table 4.6 and Map 4.3).

4.6 Status of Road Connectivity

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 realized by farmers. By improving communication, roads can increase the options for 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 targeted at the rural poor, have all contributed to reductions in rural poverty and agricultural productivity. The marginal government expenditure on roads, in particular, has been found to be having the largest positive impact on productivity growth (Fan, et al 1999).

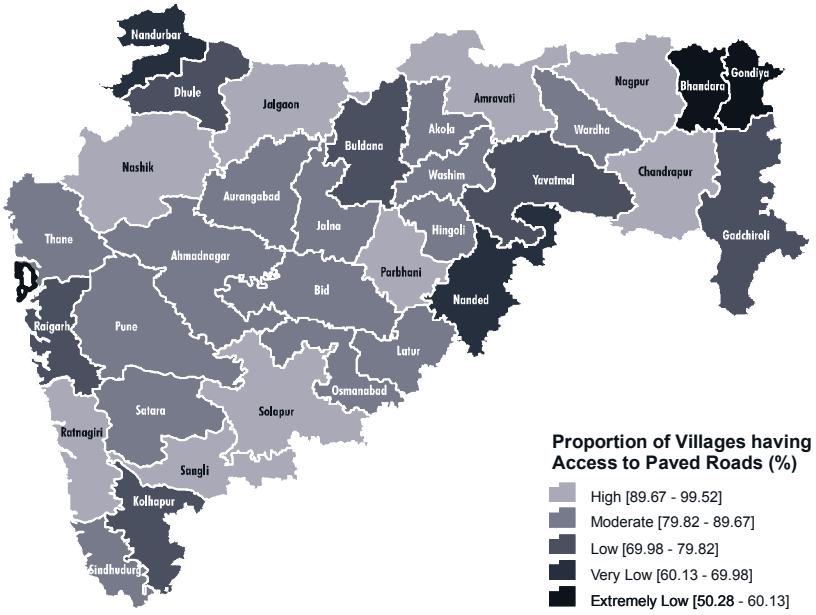
Roads in rural areas act as feeder roads, serving such areas where agriculture is the predominant occupation, and providing them with outlets to urban market centres. These roads also play a significant role in opening up backward areas and accelerating socio-economic development. In the case of rural connectivity, the above forested districts are joined by Nanded, with very low and

Table 4.7: Districtwise Percentage of Villages having Access to Paved Roads in Maharashtra

District	Value	Rank	District	Value	Rank	District	Value	Rank
Ahmadnagar	86.23	13	Hingoli	81.90	20	Pune	88.92	10
Akola	86.23	14	Jalgaon	92.47	5	Raigarh	71.95	29
Amravati	91.77	6	Jalna	88.13	11	Ratnagiri	91.23	7
Aurangabad	83.80	17	Kolhapur	77.33	27	Sangli	93.48	3
Bhandara	54.39	32	Latur	83.39	18	Satara	85.50	16
Bid	86.46	12	Nagpur	90.70	9	Sindhudurg	80.73	22
Buldana	79.81	24	Nanded	67.92	30	Solapur	98.95	2
Chandrapur	92.56	4	Nandurbar	66.16	31	Thane	80.31	23
Dhule	79.50	26	Nashik	90.79	8	Wardha	80.92	21
Gadchiroli	74.65	28	Osmanabad	82.99	19	Washim	86.17	15
Gondiya	50.28	33	Parbhani	99.52	1	Yavatmal	79.56	25

Source: As stated in Table 3.4, Variable a3.

Map 4.4: Status of Rural Connectivity in Rural Maharashtra



extremely low connectivity (Table 4.7 and Map 4.4). What are somewhat surprising are the districts of Gondiya and Bhandara with the lowest rural connectivity rankings, though they also have a relatively high proportion of irrigated lands. Overall however, as expected, there is a considerable overlap between forested districts and those with poor connectivity.

4.7 Availability Status

Based on the four indicators as given in table 4.8, the availability index has been constructed and presented in five groups in Table 4.9 (see Map 4.5).

The districts that perform the worst on the availability index are the highly forested districts, with low irrigation and low per capita agricultural product. What stands out is that the adjoining districts of Jalna and Parbhani in Marathwada, perform best of all districts on the availability index. A high per capita value of agricultural output is the biggest factor in the better performance of these two districts. Otherwise, districts with more irrigation do well in availability, as would be expected. But the worst districts lie in three corners of the state – near the Madhya Pradesh border, the Andhra Pradesh border and the Western Ghats.

Map 4.5: Food Availability Map of Rural Maharashtra

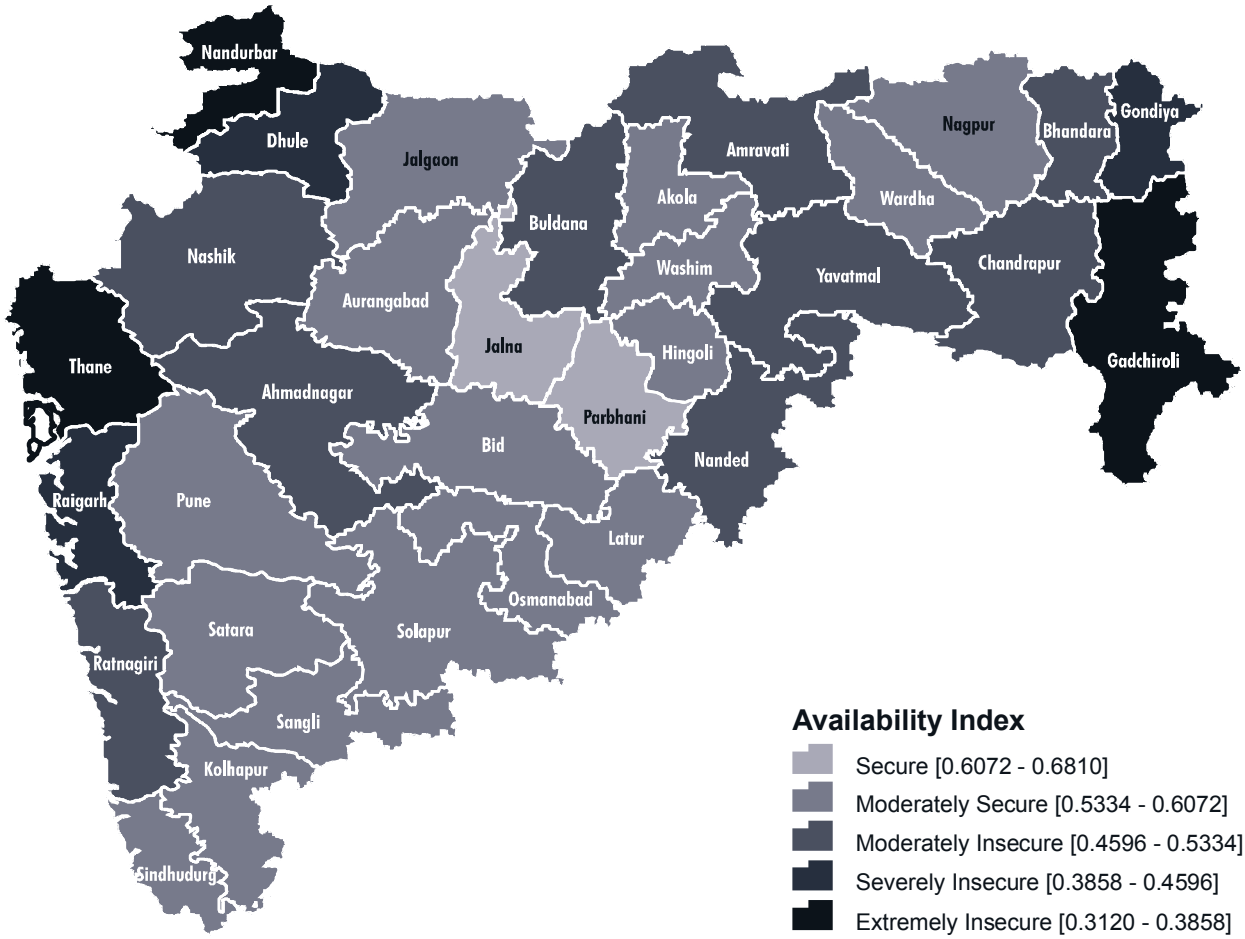


Table 4.8: Indicators Used in Construction of the Availability Index

	Share Forest Area		Irrigation Extent		Per capita Value of Agricultural Output		Paved Road	
District	**Value**	**Rank**	**Value**	**Rank**	**Value**	**Rank**	**Value**	**Rank**
Ahmadnagar	9.60	19.00	26.55	5	864.72	28	86.23	13
Akola	5.53	25.00	3.31	31	2367.96	7	86.23	14
Amravati	25.38	8.00	8.57	23	1905.62	11	91.77	6
Aurangabad	7.06	21.00	21.87	13	1578.69	19	83.80	17
Bhandara	28.84	6.00	66.04	1	1089.72	24	54.39	32
Bid	2.17	28.00	25.33	8	1823.11	15	86.46	12
Buldana	10.81	16.00	5.85	28	2119.89	9	79.81	24
Chandrapur	35.68	4.00	23.43	10	1591.78	18	92.56	4
Dhule	29.11	5.00	12.52	19	1454.30	21	79.50	26
Gadchiroli	73.78	1.00	32.77	3	682.32	31	74.65	28
Gondiya	28.84	6.00	66.04	1	816.85	30	50.28	33
Hingoli	6.07	24.00	9.32	21	2932.86	3	81.90	20
Jalgaon	13.48	15.00	18.10	16	2193.44	8	92.47	5
Jalna	0.65	31.00	18.10	16	2651.18	5	88.13	11
Kolhapur	18.96	11.00	26.41	7	2406.45	6	77.33	27
Latur	0.25	33.00	7.60	25	1838.76	14	83.39	18
Nagpur	18.67	12.00	20.86	15	1870.23	13	90.70	9
Nanded	8.28	20.00	8.10	24	1872.75	12	67.92	30
Nandurbar	47.63	2.00	12.52	19	1072.72	25	66.16	31
Nashik	20.01	10.00	22.63	11	907.96	27	90.79	8
Osmanabad	0.53	32.00	17.64	18	1676.84	17	82.99	19
Parbhani	1.03	29.00	9.32	21	3317.52	1	99.52	1
Pune	10.52	17.00	25.27	9	1121.32	23	88.92	10
Raigarh	21.84	9.00	6.05	26	841.22	29	71.95	29
Ratnagiri	0.70	30.00	1.15	33	608.22	33	91.23	7
Sangli	5.24	26.00	21.96	12	1753.45	16	93.48	3
Satara	13.50	14.00	31.12	4	1457.85	20	85.50	16
Sindhudurg	6.57	23.00	26.53	6	1297.14	22	80.73	22
Solapur	2.37	27.00	21.79	14	956.54	26	98.95	2
Thane	46.74	3.00	4.63	30	609.05	32	80.31	23
Wardha	9.87	18.00	5.83	29	3076.66	2	80.92	21
Washim	6.80	22.00	3.31	31	2917.09	4	86.17	15
Yavatmal	18.06	13.00	5.98	27	2092.49	10	79.56	25

Source: As stated in Table 3.4.

Table 4.9: Status of Districts in Availability Index of Maharashtra

Secure	Moderately Secure	Moderately Insecure	Severely Insecure	Extremely Insecure
Parbhani	Sangli	Ahmadnagar	Dhule	Thane
Jalna	Bid	Buldana	Gondiya	Nandurbar
	Jalgaon	Amravati	Raigarh	Gadchiroli
	Hingoli	Chandrapur		
	Solapur	Nashik		
	Washim	Ratnagiri		
	Wardha	Yavatmal		
	Osmanabad	Nanded		
	Akola	Bhandara		
	Nagpur			
	Satara			
	Aurangabad			
	Kolhapur			
	Latur			
	Pune			
	Sindhudurg			

5. Access to Food

The critical significance of access to food has been famously imprinted on the public mind by Sen's description of the Bengal famine, where people went hungry and starved, not because food was not available, but because they could not afford it (Sen, 1981). He linked the issue of access to a person's 'entitlements'. Broadly, entitlements refer to the bundle of goods and services a person can acquire, based on his or her endowments such as wealth and assets, skills, knowledge, status and so on. Thus, availability of food is important to food security but it is not enough; 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 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 and Tribes and by women and other marginalized groups are well-documented. This discrimination permeates all aspects of life including their livelihoods, education, health, participation in political life and access to food and the benefits of government programmes. Access to food thus depends both on the availability of economic opportunities and the social inclusion of the population in availing those opportunities.

The indicators that have been taken to discuss food access are rural wages, monthly per capita expenditure, agricultural labourers, proportion of Scheduled Castes and Scheduled Tribes, ratio of working age population, rural female literacy, women's workforce participation and urbanisation. The overall status of Maharashtra in relation to other states is presented first and thereafter we discuss the disparities across districts. Finally, we present the overall index of food access across districts and map food access.

5.1. Rural wages

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. It can be seen that Maharashtra has one of the lowest wage rates in the country (Rs. 38.58) and only Chhattisgarh, Madhya Pradesh and Orissa are below it in this respect. The wage rate in the state is nearly Rs. 10 below the national average of Rs. 48.89, while the best wage providing state Kerala has a wage rate four times that of Maharashtra (Table 5.1).

Casual wage rates follow the level of agricultural development in the state. Only two districts namely Raigarh and Thane have a rural casual wage rate more than the national average (Table 5.2). Comparing the wage rates with the National Minimum Wage, there is not even a single district in the state that comes close to the recommended wage rate of Rs. 66, which speaks of the extremely

Table 5.1: Wage Rate of Casual Workers by State, 2004-05

India/States	Average Casual Rural Wage Value (Rs.)	Rank	States	Average Casual Rural Wage Value (Rs.)	Rank
India	48.89	-	Andhra Pradesh	42.13	12
Assam	60.18	5	Bihar	43.95	11
Chhattisgarh	34.07	17	Gujarat	49.72	8
Haryana	72.2	3	Jharkhand	48.07	10
Karnataka	41.32	13	Kerala	119.51	1
Madhya Pradesh	35.76	16	Maharashtra	38.58	14
Orissa	38.45	15	Punjab	73.12	2
Rajasthan	62.12	4	Tamil Nadu	56.48	6
Uttar Pradesh	51.25	7	West Bengal	48.38	9

Source: Asstated in Table 3.4, Variable b5.

vulnerable condition of casual workers in the state. Most of the districts are in the low categories for rural wage rates. There could be a connection between a high proportion of agricultural labourers, low rural wage rates and low consumption (see Map 5.1).

Map 5.1: Wage Rates of Rural Population in Maharashtra

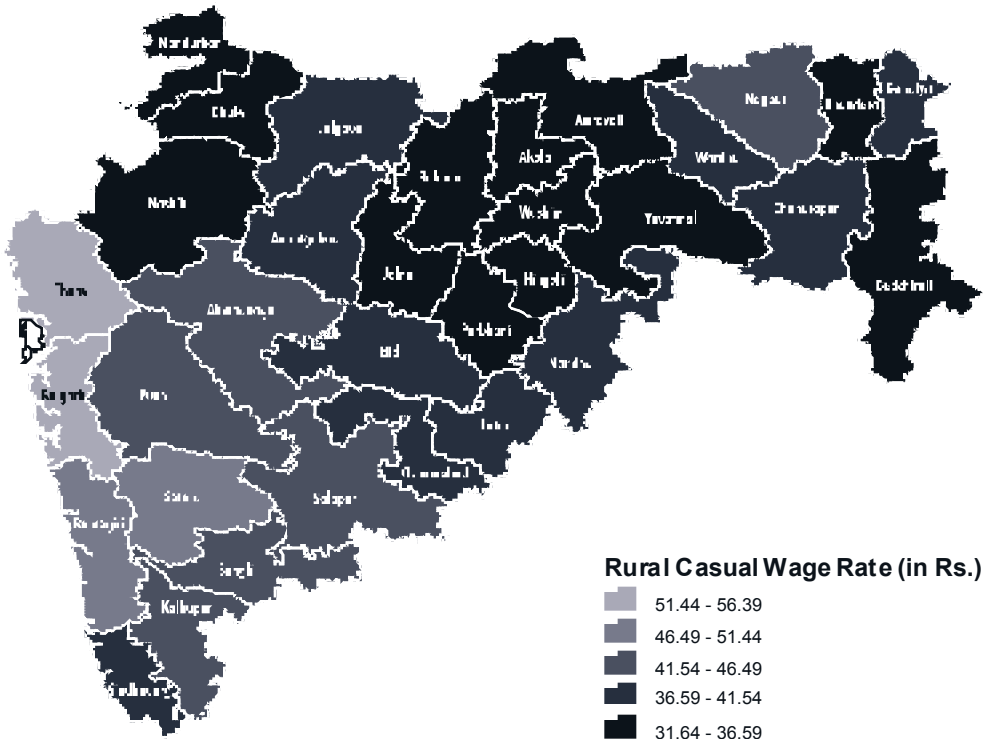


Table 5.2: Rural Casual Wage Rate by District in Maharashtra (Rs.), 2004-05

District	Wage	Rank	District	Wage	Rank	District	Wage	Rank
Ahmadnagar	43.31	8	Hingoli	35.15	24	Pune	45.42	5
Akola	31.79	32	Jalgaon	37.30	17	Raigarh	56.39	1
Amravati	32.49	29	Jalna	35.65	22	Ratnagiri	47.86	4
Aurangabad	37.29	18	Kolhapur	42.84	9	Sangli	43.66	7
Bhandara	32.55	28	Latur	37.29	19	Satara	48.58	3
Bid	37.43	16	Nagpur	43.99	6	Sindhudurg	38.77	13
Buldana	31.64	33	Nanded	38.88	12	Solapur	41.86	10
Chandrapur	38.13	14	Nandurbar	35.64	23	Thane	53.76	2
Dhule	35.14	25	Nashik	33.12	27	Wardha	37.86	15
Gadchiroli	36.47	21	Osmanabad	41.29	11	Washim	33.57	26
Gondiya	36.66	20	Parbhani	32.44	30	Yavatmal	32.44	31

Source: As stated in Table 3.4, Variable b5.

5.2. Monthly Per Capita Expenditure

Low income levels directly affect consumption patterns. The per capita consumption expenditure is a good indicator of food security in rural areas. Per capita consumption expenditure on food (Rs. 293.29) in Maharashtra is lower than the national average (Rs. 307) (Table 5.3).

Table 5.3: Monthly Per Capita Expenditure on Food, 2004-05

India/States	Value (Rs.)	Rank	States	Value (Rs.)	Rank
India	307.60	-	Andhra Pradesh	323.15	9
Assam	358.44	4	Bihar	270.26	13
Chhattisgarh	239.08	16	Gujarat	345.46	6
Haryana	419.34	2	Jharkhand	263.22	14
Karnataka	283.04	12	Kerala	455.64	1
Madhya Pradesh	232.17	17	Maharashtra	293.29	11
Orissa	245.58	15	Punjab	416.45	3
Rajasthan	323.97	8	Tamil Nadu	315.49	10
Uttar Pradesh	345.88	5	West Bengal	329.93	7

Source: As stated in Table 3.4, Variable b4.

Other than South and Central Maharashtra, the rest of the state, i.e. all of Vidarbha, most of Marathwada and the North, are in the low to extremely low categories of rural consumption expenditures. The southern districts like Pune, Satara, Sindhudurg, and Kolhapur have high monthly per capita expenditure (see Map 5.2). There is not necessarily a correspondence between agricultural output

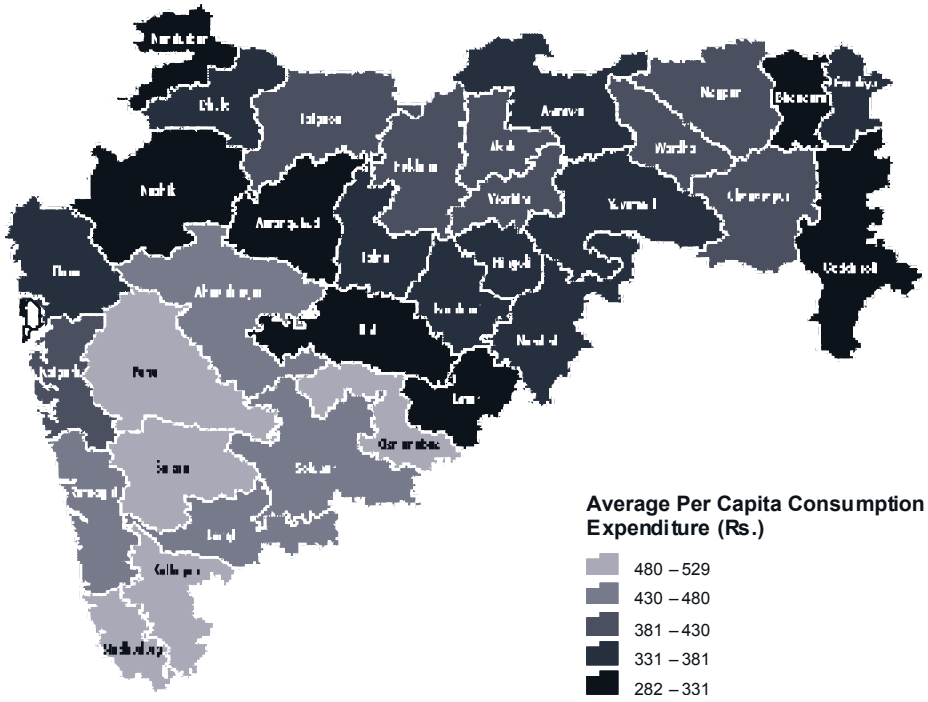
per capita and consumption expenditure, since districts with high migration can have high consumption over agricultural production through remittances, even with low levels of rural non-farm enterprises.

Table 5.4: Monthly Per Capita Expenditure in Maharashtra, 2004-05

District	Value (Rs)	Rank	District	Value (Rs)	Rank	District	Value (Rs)	Rank
Ahmadnagar	477.51	6	Hingoli	378.56	18	Pune	529.43	1
Akola	414.12	13	Jalgaon	415.95	11	Raigarh	429.26	10
Amravati	343.70	25	Jalna	348.65	23	Ratnagiri	431.21	9
Aurangabad	317.89	28	Kolhapur	484.66	4	Sangli	432.60	8
Bhandara	281.69	32	Latur	311.39	29	Satara	519.49	2
Bid	305.31	30	Nagpur	410.14	15	Sindhudurg	499.23	3
Buldana	390.18	17	Nanded	333.34	26	Solapur	475.49	7
Chandrapur	415.91	12	Nandurbar	302.22	31	Thane	377.58	20
Dhule	362.52	21	Nashik	319.04	27	Wardha	410.14	15
Gadchiroli	281.69	32	Osmanabad	481.78	5	Washim	414.12	13
Gondiya	345.72	24	Parbhani	378.56	18	Yavatmal	350.40	22

Source: As stated in Table 3.4, Variable b4.

Map 5.2: Status of Consumption Expenditure in Maharashtra



5.3. Agricultural Labourers

Maharashtra has a high proportion of agricultural labourers (Table 5.5). Among states with dominant (more than two-thirds) workers engaged in agriculture, Maharashtra with 37.8 percent of agricultural labourers in the workforce ranks after Bihar, Andhra Pradesh, Tamil Nadu and Orissa. In the latter states, agricultural labourers outnumber cultivators, while in Maharashtra the two are almost equal.

Table 5.5: Proportion of Agricultural Labourers in Workforce by State, 2001

Area Name	Value (%)	Rank	Area Name	Value (%)	Rank
India	33	–	Andhra Pradesh	47.5	16
Assam	14.9	2	Bihar	51.0	17
Chhattisgarh	36.1	12	Gujarat	33.2	9
Haryana	19.0	3	Jharkhand	32.8	7
Karnataka	34.5	11	Kerala	19.6	4
Madhya Pradesh	34.1	10	Maharashtra	37.8	13
Orissa	39.1	14	Punjab	21.9	5
Rajasthan	12.3	1	Tamil Nadu	42.9	15
Uttar Pradesh	28.9	6	West Bengal	33.1	8

Source: As stated in Table 3.4, Variable b1.

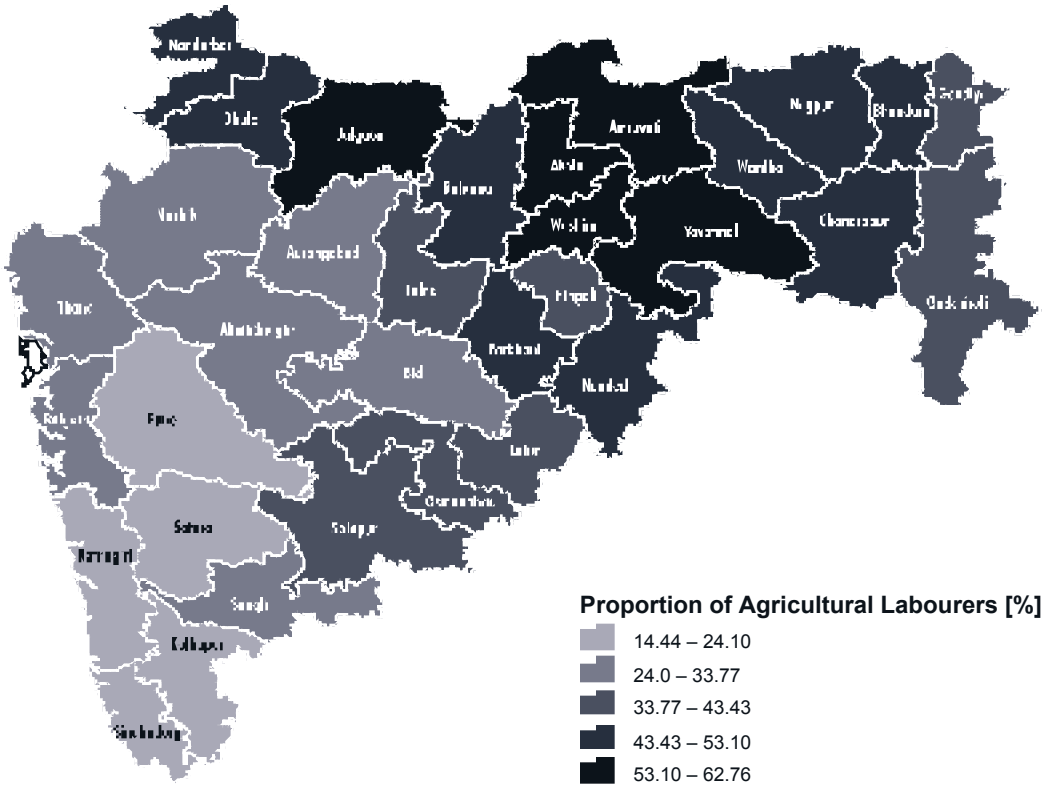
More than 50 percent of the workers are engaged in agricultural labour in as many as eight districts in Maharashtra (Table 5.6). Most of Vidarbha and the adjoining districts of Marathwada have a high proportion of agricultural labourers to total agricultural workers. The Northern districts of Jalgaon,

Table 5.6: Proportion of Agricultural Labourers in Workforce by Districts, 2001

District	Value (%)	Rank	District	Value (%)	Rank	District	Value (%)	Rank
Ahmadnagar	28.37	25	Hingoli	40.53	17	Pune	23.46	29
Akola	61.98	2	Jalgaon	55.12	5	Raigarh	24.98	28
Amravati	62.76	1	Jalna	37.33	20	Ratnagiri	14.44	33
Aurangabad	32.39	23	Kolhapur	21.08	31	Sangli	26.22	27
Bhandara	49.31	10	Latur	43.03	15	Satara	23.36	30
Bid	31.75	24	Nagpur	46.74	13	Sindhudurg	20.8	32
Buldana	49.99	9	Nanded	47.36	12	Solapur	36.29	21
Chandrapur	48.59	11	Nandurbar	51.94	6	Thane	27.25	26
Dhule	50.58	7	Nashik	33.16	22	Wardha	50.45	8
Gadchiroli	38.98	19	Osmanabad	41.82	16	Washim	55.71	3
Gondiya	39.23	18	Parbhani	44.2	14	Yavatmal	55.31	4

Source: As stated in Table 3.4, Variable b1.

Map 5.3: Share of Agricultural Labourers in Total Workers



Dhule and Nandurbar also fallin this category. Most of the southern districts like Ratnagiri, Sindhudurg, Kolhapur, Satara, Pune have the lowest proportion of agricultural labourers (Map 5.3).

5.4 Proportion of Scheduled Tribes and Scheduled Castes

Rural Maharashtra has more tribal population than Scheduled Caste population. While Scheduled Tribes are marginalized mostly on account of their location, the Scheduled Castes have faced historical discrimination, which accounts for their marginalized and vulnerable status. The Scheduled Castes constitute 10.9 per cent of the population in rural Maharashtra whereas Scheduled Tribes constitute 13.4 per cent. Together, they account for one-fourth of the population in rural Maharashtra (Table 5.7).

As would be expected, the hilly and forest-dominated districts of Nandurbar, Thane and Gadchiroli have a very high tribal population. On the other hand, Vidarbha and Latur and Osmanabad in Marathwada have a higher proportion of Scheduled Castes (see Map 5.4 and Table 5.8).

Table 5.7: Proportion of Scheduled Tribes and Scheduled Castes in the Rural Population by State

India/States	Proportion of Rural Scheduled Castes		Proportion of Rural Scheduled Tribes	
	Value	Rank	Value	Rank
India	17.9	-	10.4	-
Andhra Pradesh	18.4	11	8.4	8
Assam	6.7	1	13.6	11
Bihar	16.4	8	1.0	4
Chhattisgarh	11.4	5	37.6	17
Gujarat	6.9	2	21.6	13
Haryana	21.4	13	0	1
Jharkhand	12.4	6	31.0	16
Karnataka	18.4	11	8.4	8
Kerala	10.8	3	1.5	5
Madhya Pradesh	15.6	7	25.8	15
Maharashtra	10.9	4	13.4	10
Orissa	17.2	9	24.6	14
Punjab	33.0	17	0	1
Rajasthan	17.9	10	15.5	12
Tamil Nadu	23.8	15	1.6	6
Uttar Pradesh	23.4	14	0.1	3
West Bengal	26.9	16	7.2	7

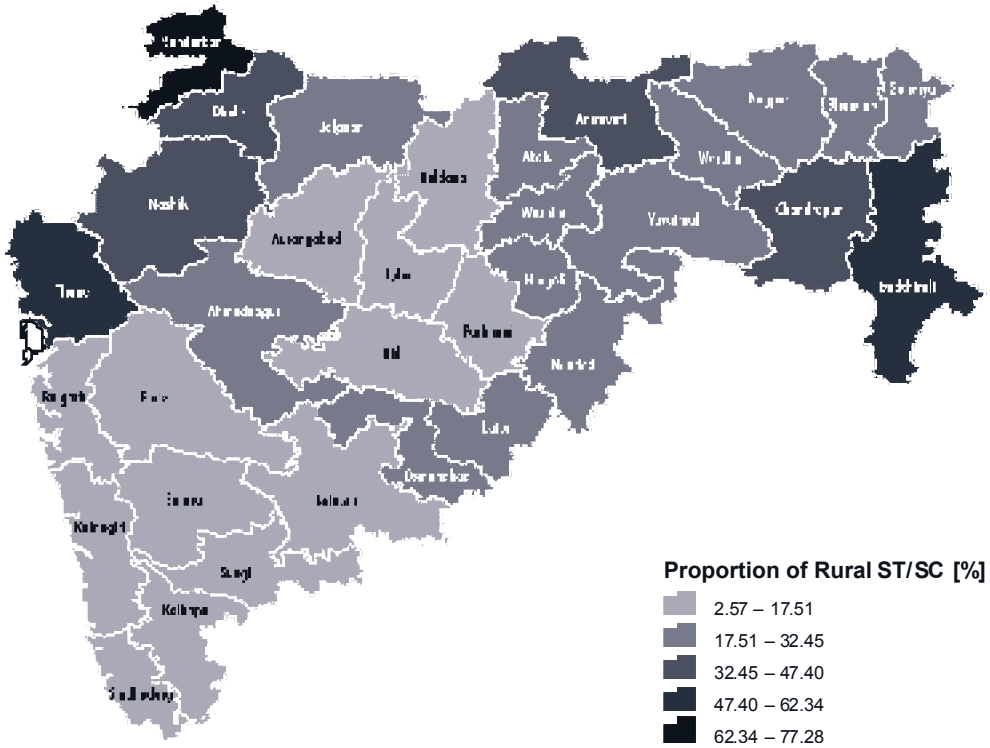
Source: Census of India, 2001.

Table 5.8: Proportion of SC-ST Population by Districts

District	Value (%)	Rank	District	Value (%)	Rank	District	Value (%)	Rank
Ahmadnagar	20.63	17	Hingoli	20.27	18	Pune	14.76	25
Akola	19.96	19	Jalgaon	22.88	16	Raigarh	16.54	23
Amravati	37.53	6	Jalna	13.77	28	Ratnagiri	2.57	33
Aurangabad	15.97	24	Kolhapur	14.04	27	Sangli	12.57	30
Bhandara	26.52	13	Latur	23.02	15	Satara	9.15	31
Bid	14.26	26	Nagpur	31.56	9	Sindhudurg	5.06	32
Buldana	17.15	22	Nanded	28.75	11	Solapur	17.33	21
Chandrapur	35.1	7	Nandurbar	77.28	1	Thane	49.02	3
Dhule	39.28	5	Nashik	42.5	4	Wardha	26.86	12
Gadchiroli	51.19	2	Osmanabad	18.84	20	Washim	24.85	14
Gondiya	31.18	10	Parbhani	13.03	29	Yavatmal	32.1	8

Source: As stated in Table 3.4, variable b2.

Map 5.4: Proportion of Rural Scheduled Castes and Scheduled Tribes



5.5. Ratio of Working Age Population

The proportion 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 proportion 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, 2006).

The situation in Maharashtra in terms of the ratio of population in the productive age is found to be better compared to many states as well as to the national average. The southern states in general have a better working age ratio than the northern states. Maharashtra (1.26) lies midway between the best-performing state (Kerala - 1.70) and the worst-performing state (UP - 1.02). A low working age ratio implies a greater dependence on the existing productive population, and may also be related to high out-migration (Table 5.9).

Table 5.9: Ratio of Working Age Population by State

India/states	Value	Rank	States	Value	Rank
India	1.22	–	Andhra Pradesh	1.44	3
Assam	1.24	10	Bihar	1.03	16
Chhattisgarh	1.19	12	Gujarat	1.38	5
Haryana	1.21	11	Jharkhand	1.11	13
Karnataka	1.41	4	Kerala	1.70	1
Madhya Pradesh	1.10	14	Maharashtra	1.26	9
Orissa	1.35	7	Punjab	1.37	6
Rajasthan	1.06	15	Tamil Nadu	1.67	2
Uttar Pradesh	1.02	17	West Bengal	1.34	8

Source:Census of India, 2001

All the districts in Maharashtra have more population in the productive age as compared to the dependent age category. However, the values range between 1 to 1.5, showing a high disparity among the districts. The north-eastern districts like Nagpur, Bhandara, Gondiya, Chandrapur and Wardha and southern districts like Kolhapur and Sindhudurg have high level of ratio of working age population. The eastern districts on the other hand have a low ratio of working age population (Table 5.10 and Map 5.5).

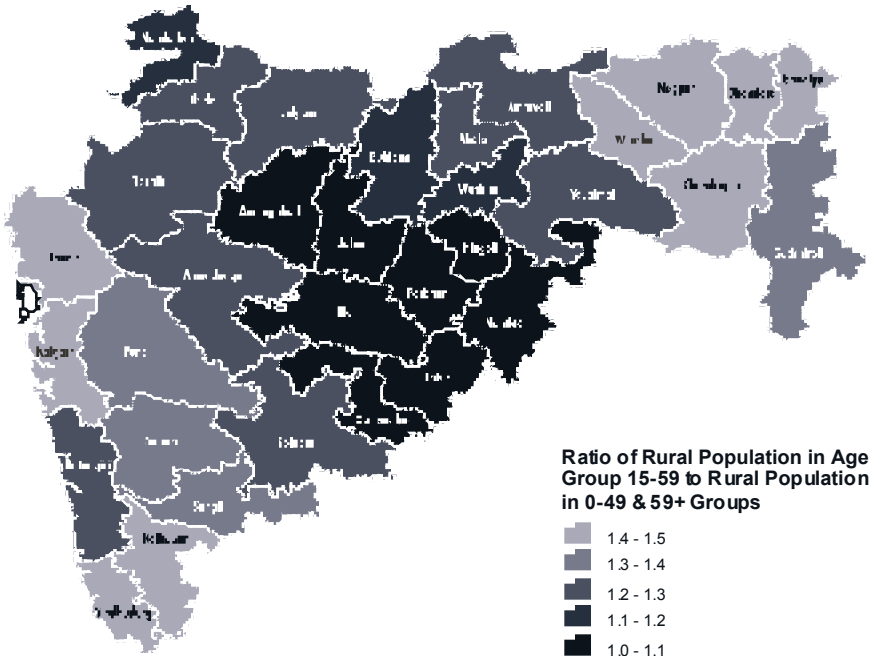
The change in working age population, at least at the sub-regional level, is highly influenced by the movement of population in this age group. In a developing region, young people move out in search of employment. It has already been seen in the analysis of per capita agricultural production that per

Table 5.10: Ratio of Working Age Population in Maharashtra

District	Value	Rank	District	Value	Rank	District	Value	Rank
Ahmadnagar	1.25	20	Hingoli	1.04	30	Pune	1.36	11
Akola	1.28	16	Jalgaon	1.27	18	Raigarh	1.41	9
Amravati	1.30	14	Jalna	1.03	32	Ratnagiri	1.29	15
Aurangabad	1.07	28	Kolhapur	1.49	2	Sangli	1.35	13
Bhandara	1.50	1	Latur	1.07	27	Satara	1.35	12
Bid	1.03	31	Nagpur	1.41	8	Sindhudurg	1.43	5
Buldana	1.20	23	Nanded	1.06	29	Solapur	1.23	22
Chandrapur	1.43	4	Nandurbar	1.14	25	Thane	1.43	6
Dhule	1.24	21	Nashik	1.26	19	Wardha	1.43	7
Gadchiroli	1.37	10	Osmanabad	1.08	26	Washim	1.18	24
Gondiya	1.46	3	Parbhani	1.00	33	Yavatmal	1.27	17

Source: As stated in Table 3.4, Variable b3.

Map 5.5: Share of Rural Working Age Population



capita production is lower in the agriculturally developed regions of the state, mainly on account of their larger population size, which might be explained by an influx from the adjoining districts. Similarly, in the case of working age group population, the proportion is higher in the north-east and southern regions, where again migratory movement has a definite role.

Those who migrate due to lack of employment opportunities are stuck between the devil and the deep sea. They 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 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 and Sasikumar, 2003). At the same time migration does improve food security in it reduces the proportion of dependents and increase remittances.

5.6 Rural Female Literacy

Enhancing female literacy has been recognized as the single most important factor contributing to increase in food security and decline in malnutrition and mortality levels (UNICEF, 2007a). In the case of the rural female literacy, Maharashtra is ranked second after Kerala. Almost 60 per cent of the rural females of Maharashtra are literate, which is 12 percent points higher than the national average (46 percent) (Table 5.11).

Table 5.11: Rural Female Literacy by State

India/States	Value	Rank	States	Value	Rank
India	46.1	–	Andhra Pradesh	43.5	12
Assam	50.7	6	Bihar	29.6	17
Chhattisgarh	47.0	10	Gujarat	47.8	9
Haryana	49.3	7	Jharkhand	29.9	16
Karnataka	48.0	8	Kerala	86.7	1
Madhya Pradesh	42.8	13	Maharashtra	58.4	2
Orissa	46.7	11	Punjab	57.7	3
Rajasthan	37.3	14	Tamil Nadu	55.3	4
Uttar Pradesh	36.9	15	West Bengal	53.2	5

Source:Census of India, 2001

Rural female literacy is generally high in Maharashtra - only 6 out of 33 districts go below 50 percent (taking Nanded's 49.95 percent as being equal to 50 percent). Besides the hill districts of Gadchiroli and Nandurbar, the districts with low rural female literacy are in Marathwada - Jalna, Parbhnai, Hingoli, Nanded, Bid and Aurangabad. Surprisingly, the region around Nagpur - Amravati, Akola, Wardha, Nagpur and Gondiya are all in the highest category (Table 5.12 and Map 5.6).

Map 5.6: Status of Rural Female Literacy

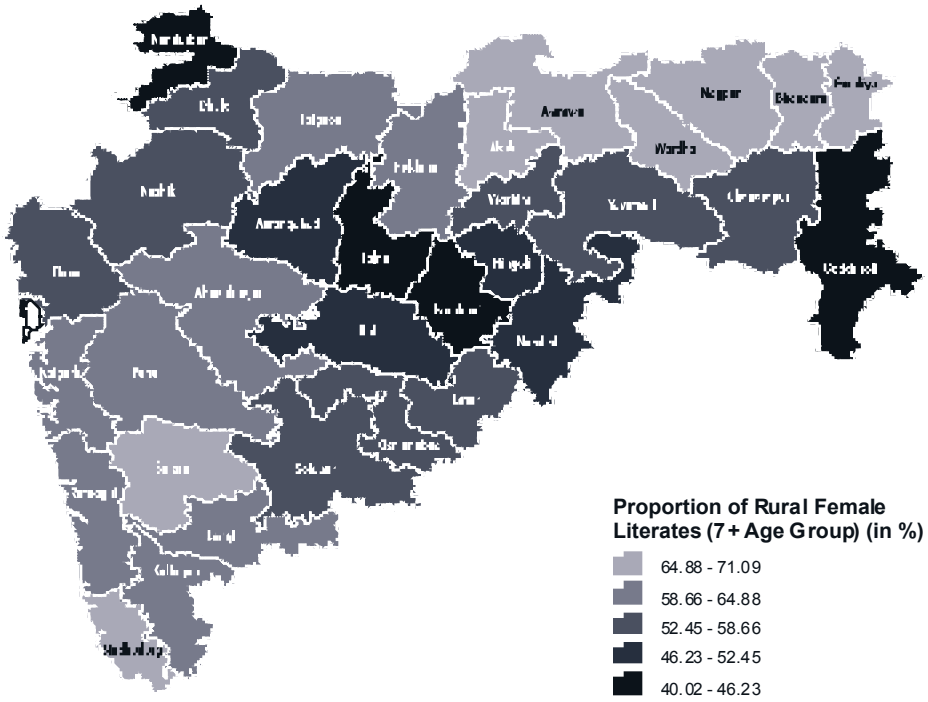


Table 5.12: Rural Female Literacy in Maharashtra

District	Value (%)	Rank	District	Value (%)	Rank	District	Value (%)	Rank
Ahmadnagar	61.14	12	Hingoli	48.26	29	Pune	60.74	14
Akola	69.13	3	Jalgaon	59.56	16	Raigarh	63.64	9
Amravati	71.09	1	Jalna	44.62	32	Ratnagiri	63.56	10
Aurangabad	51.59	26	Kolhapur	60.70	15	Sangli	63.47	11
Bhandara	65.19	8	Latur	55.88	21	Satara	66.45	6
Bid	51.00	27	Nagpur	66.56	5	Sindhudurg	69.83	2
Buldana	60.99	13	Nanded	49.95	28	Solapur	56.12	19
Chandrapur	56.04	20	Nandurbar	40.02	33	Thane	52.59	25
Dhule	55.65	23	Nashik	55.80	22	Wardha	68.57	4
Gadchiroli	46.05	30	Osmanabad	54.40	24	Washim	57.56	18
Gondiya	65.55	7	Parbhani	45.48	31	Yavatmal	58.48	17

Source: As stated in Table 3.4, Variable B6.

Box 5.1 Female Literacy: The Pivot for Reducing Food Insecurity and Child Mortality

Recent research findings from 35 demographic and health surveys have brought out that children of mothers with no education are more than twice as likely to die or to be malnourished compared with children of mothers who have secondary or higher education. Further, mothers with limited literacy and educational skills are much less likely to receive trained support during pregnancy and childbirth. In Nigeria, for instance, only 15 percent of births among uneducated women are assisted by trained medical personnel, compared to 56 percent of births among women with primary education and 88 percent among women with higher education.

Source: Save the Children, 2006

5.7 Women's Workforce Participation

Women's workforce participation improves the household's access to food, and is also likely to improve women's own access to food - following Amartya Sen's argument that women's independent income would increase their bargaining power within the household. At the same time, women's participation in the rural workforce is likely to be inversely related to a household's food security situation. It would be highest among agricultural labourers and go down as one moves up land cultivating categories. Women's workforce participation is also likely to be related to caste and ethnicity – higher among STs and lower as one goes up the caste ladder. Thus, one can expect a negative relation between women's workforce participation and the household's food security in a rural situation. It is in urban households that the relationship between food security and women's workforce participation may go both ways. For rural food security, we can continue to use women's workforce participation as being negatively related to the food security situation, with high participation being associated with a

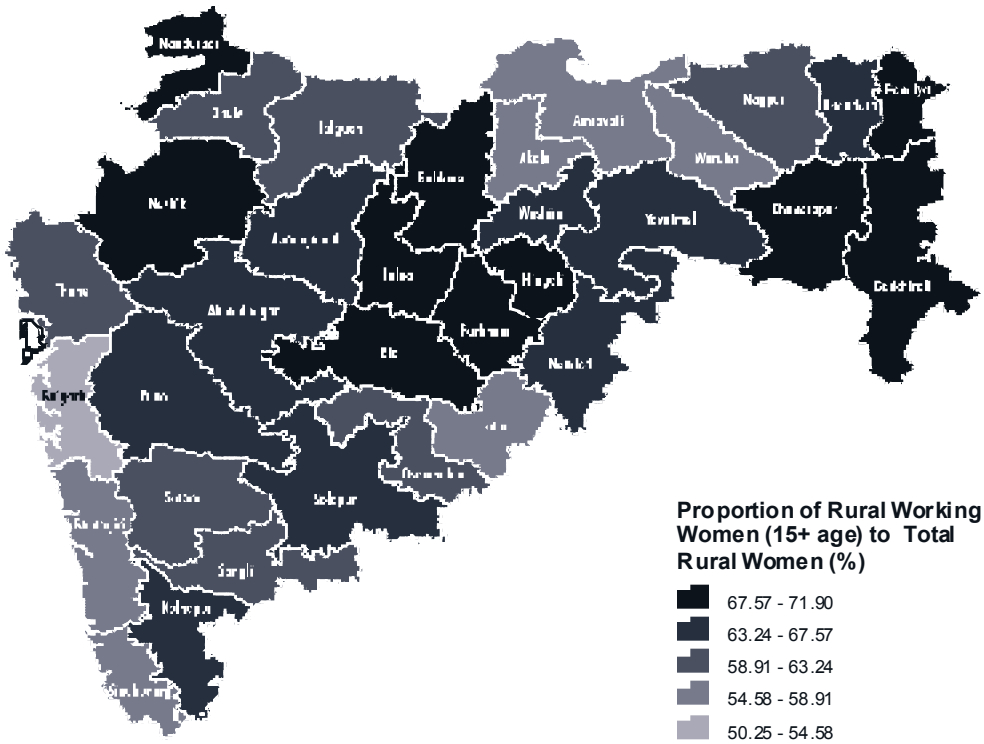
poor food security situation. In Maharashtra, the female workforce participation is usually high ranging from 50 per cent to nearly 72 per cent (Table 5.13 and Map 5.7).

Table 5.13: Women's Work Participation Rate in Maharashtra, 2001

Districts	Value	Rank	Districts	Value	Rank	Districts	Value	Rank
Ahmadnagar	65.18	15	Hingoli	71.9	1	Pune	63.48	19
Akola	55.5	31	Jalgaon	61.05	24	Raigarh	50.25	33
Amravati	56.22	30	Jalna	68.28	9	Ratnagiri	57.89	29
Aurangabad	66.47	11	Kolhapur	63.92	18	Sangli	61.5	22
Bhandara	66.02	13	Latur	58.47	28	Satara	59.37	25
Bid	69.21	6	Nagpur	61.51	21	Sindhudurg	54.96	32
Buldana	67.79	10	Nanded	65.05	16	Solapur	66.34	12
Chandrapur	68.5	7	Nandurbar	71.22	3	Thane	59.35	26
Dhule	62.42	20	Nashik	71.1	4	Wardha	58.59	27
Gadchiroli	71.78	2	Osmanabad	61.5	22	Washim	65.57	14
Gondiya	68.29	8	Parbhani	70.58	5	Yavatmal	63.95	17

Source: Census of India, 2001.

Map 5.7: Women Workforce Participation Rate in Rural Maharashtra



Women's workforce participation is also intrinsically related to migration. The nature of migration largely reflects household subsistence strategies in the face of social, cultural, demographic and other constraints. It is generally males who predominate in the streams of labour migration, but in the case of tribals and lower economic strata, both men and women migrate together for work. This is because, as already stated, in these populations the constraints on women's participation in non-household activities are fewer. In some sectors, like construction, brick kilns, sowing, transplanting and harvesting of wheat and paddy and sugarcane cutting, family migration is common as it is more economical for employers (Srivastava & Sasikumar, 2003).

In a more general sense, what can be said is that women's empowerment is directly related to improved food security. One key factor in empowerment can be the acquiring of land rights by women.

5.8 Urbanization and Migration

Migration may be facilitated by the extent of urbanization. Larger urban populations increase opportunities for a variety of livelihood options. But the livelihoods one can engage in depend very much on one's literacy and skills. Unskilled, illiterate persons can only take up low income and energy-demanding work such as rickshaw-pulling or vegetable selling; or, work as contract labour in mines and factories, or in brick-kilns and in other construction work. Engaging in such employment would reduce the burden on feeding them in the village household, but is likely to yield very little in terms of remittances.

Districts such as Thane, Nagpur and Pune, clearly stand out with high levels of urbanization. But for the state of Maharashtra, it is not just urbanization within the district that is important. The presence of Mumbai and the Mumbai-Thane-Pune region makes a difference to the impact of urbanization in the state as a whole. Districts, such as Sindhudurg and Ratnagiri, in the Coastal belt, may have among the lowest levels of urbanization (Table 5.14 and Map 5.8), but they have historically accounted for a large proportion of migrants into Mumbai. This has been so right from the end of the nineteenth century, when migrants from these districts formed the bulk of the working class, both in the city's textile mills and its harbour.

There is a clear regional pattern of migration within Maharashtra. The three divisions of Konkan, Pune and Nashik, i.e. Western Maharashtra, accounted for fully 90 percent of intra-state migrants into urban Maharashtra. Marathwada accounted for just 5 to 6 percent of these migrants, and Vidarbha for just 1 or 2 per cent of intra-state migrants. Among the migrants to Mumbai from other districts of Maharashtra, nearly half came from the adjoining districts of the Thane and Konkan divisions, from Raigarh, Ratnagiri and Sindhudurg. Almost one-third were from Pune division, and one-tenth from Nashik division (Government of Maharashtra, 2002).

Table 5.14: Urbanization in Maharashtra, 2001

District	Value	Rank	District	Value	Rank	District	Value	Rank
Ahmadnagar	19.89	7	Hingoli	15.6	26	Pune	58.08	3
Akola	38.49	1	Jalgaon	28.59	12	Raigarh	24.22	16
Amravati	34.5	3	Jalna	19.09	21	Ratnagiri	11.33	31
Aurangabad	37.53	2	Kolhapur	29.81	11	Sangli	24.51	15
Bhandara	15.47	9	Latur	23.57	18	Satara	14.17	29
Bid	17.91	8	Nagpur	64.26	2	Sindhudurg	9.47	32
Buldana	21.2	6	Nanded	23.96	17	Solapur	31.83	9
Chandrapur	32.11	4	Nandurbar	15.45	28	Thane	72.58	1
Dhule	26.11	5	Nashik	38.8	4	Wardha	26.28	13
Gadchiroli	6.93	11	Osmanabad	15.69	25	Washim	17.49	24
Gondiya	11.95	10	Parbhani	31.76	10	Yavatmal	18.6	22

Source: Census of India, 2001.

Map 5.8: Level of Urbanization in Maharashtra

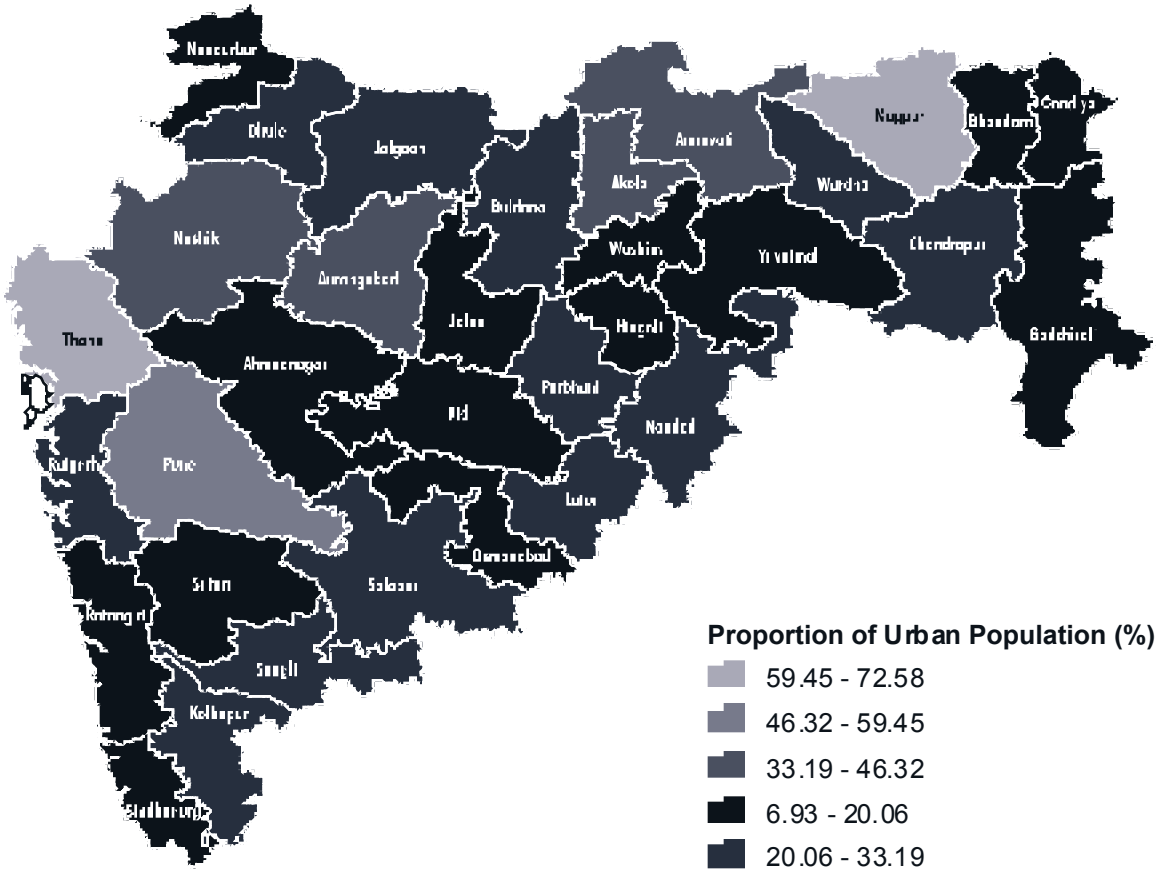


Table 5.15: Indicators used in the Construction of Food Access Index

District	Agricultural Labourers		Percentage of SC and ST		Ratio of Working Population		MPCE		Rural Wage		Rural Female Literacy	
	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank	Value	Rank
Ahmadnagar	28.37	25	20.63	17	1.25	20	478	6	43.31	8	61.14	12
Akola	61.98	2	19.96	19	1.28	16	414	13	31.79	32	69.13	3
Amravati	62.76	1	37.53	6	1.30	14	344	25	32.49	29	71.09	1
Aurangabad	32.39	23	15.97	24	1.07	28	318	28	37.29	18	51.59	26
Bhandara	49.31	10	26.52	13	1.50	1	282	32	32.55	28	65.19	8
Bid	31.75	24	14.26	26	1.03	31	305	30	37.43	16	51.00	27
Buldana	49.99	9	17.15	22	1.20	23	390	17	31.64	33	60.99	13
Chandrapur	48.59	11	35.10	7	1.43	4	416	12	38.13	14	56.04	20
Dhule	50.58	7	39.28	5	1.24	21	363	21	35.14	25	55.65	23
Gadchiroli	38.98	19	51.19	2	1.37	10	282	32	36.47	21	46.05	30
Gondiya	39.23	18	31.18	10	1.46	3	346	24	36.66	20	65.55	7
Hingoli	40.53	17	20.27	18	1.04	30	379	18	35.15	24	48.26	29
Jalgaon	55.12	5	22.88	16	1.27	18	416	11	37.30	17	59.56	16
Jalna	37.33	20	13.77	28	1.03	32	349	23	35.65	22	44.62	32
Kolhapur	21.08	31	14.04	27	1.49	2	485	4	42.84	9	60.70	15
Latur	43.03	15	23.02	15	1.07	27	311	29	37.29	19	55.88	21
Nagpur	46.74	13	31.56	9	1.41	8	410	15	43.99	6	66.56	5
Nanded	47.36	12	28.75	11	1.06	29	333	26	38.88	12	49.95	28
Nandurbar	51.94	6	77.28	1	1.14	25	302	31	35.64	23	40.02	33
Nashik	33.16	22	42.50	4	1.26	19	319	27	33.12	27	55.80	22
Osmanabad	41.82	16	18.84	20	1.08	26	482	5	41.29	11	54.40	24
Parbhani	44.20	14	13.03	29	1.00	33	379	18	32.44	30	45.48	31
Pune	23.46	29	14.76	25	1.36	11	529	1	45.42	5	60.74	14
Raigarh	24.98	28	16.54	23	1.41	9	429	10	56.39	1	63.64	9
Ratnagiri	14.44	33	2.57	33	1.29	15	431	9	47.86	4	63.56	10
Sangli	26.22	27	12.57	30	1.35	13	433	8	43.66	7	63.47	11
Satara	23.36	30	9.15	31	1.35	12	519	2	48.58	3	66.45	6
Sindhudurg	20.80	32	5.06	32	1.43	5	499	3	38.77	13	69.83	2
Solapur	36.29	21	17.33	21	1.23	22	475	7	41.86	10	56.12	19
Thane	27.25	26	49.02	3	1.43	6	378	20	53.76	2	52.59	25
Wardha	50.45	8	26.86	12	1.43	7	410	15	37.86	15	68.57	4
Washim	55.71	3	24.85	14	1.18	24	414	13	33.57	26	57.56	18
Yavatmal	55.31	4	32.10	8	1.27	17	350	22	32.44	31	58.48	17

This regional pattern of migration, with Marthwada and Vidarbha not benefiting much from the manufacturing and service sector development of the Mumbai-Thane-Pune region, means that these divisions are not as able to use migration as a means of reducing poverty and thus improving food security. The reliance on own production is much more in the Marathwada and Vidarbha. It should come as no surprise if food insecurity is concentrated in those regions and districts (or sub-districts) that are unable to utilize the migration route for improving food security. Both social networks and capabilities (levels of education) play their role in determining migration patterns.

5.9 Food Access Status

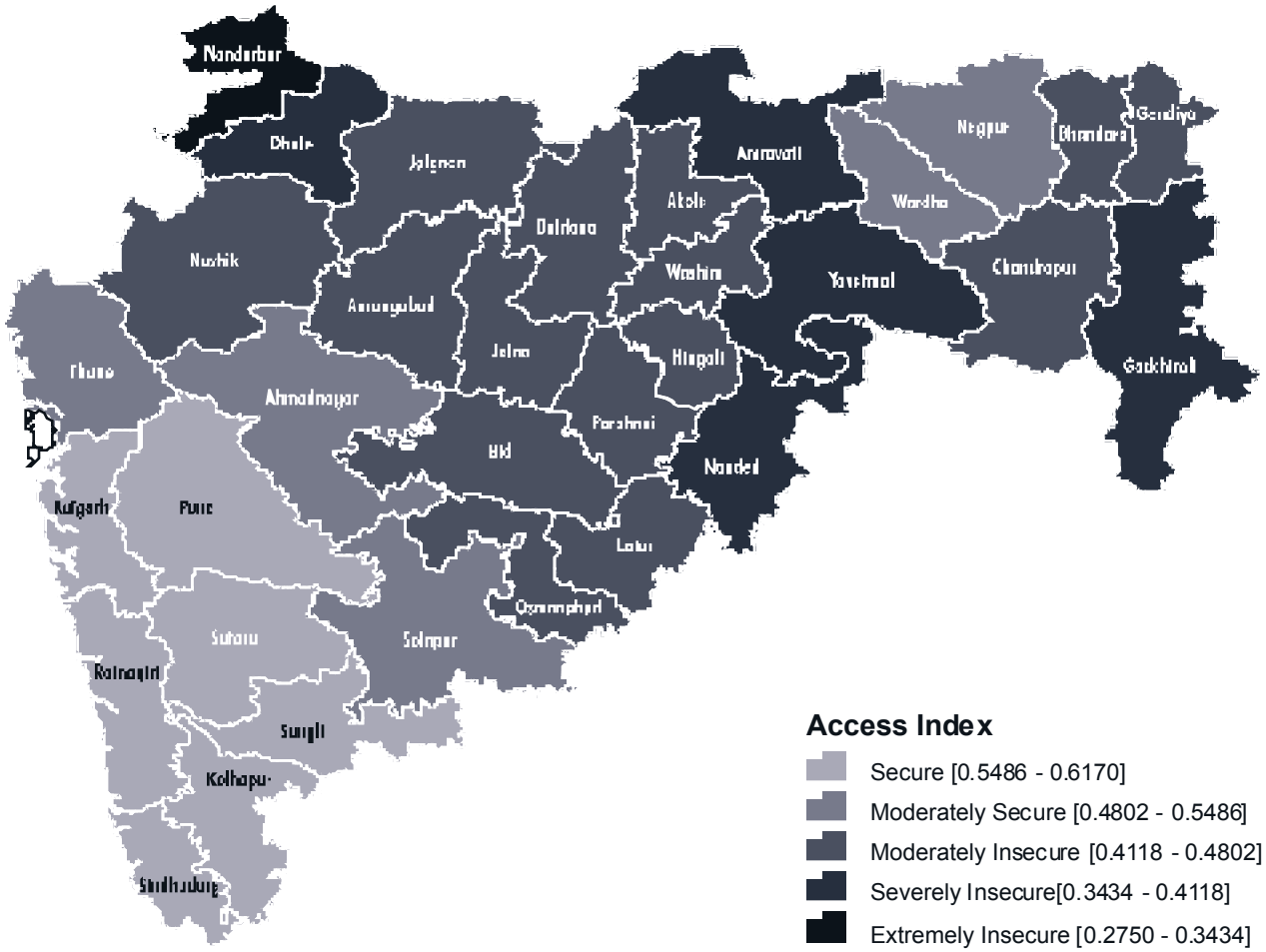
The divide between the food secure and insecure regions is much sharper in terms of the indicators used to measure access to food. The composite index of food access shows that the districts in southern Maharasthra are secure whereas Nandurbar, a north-western district, falls in the extremely insecure category in terms of food access (Table 5.16 and Map 5.9). Besides other hill-dominated districts (Gadchiroli, Dhule and Nashik) are in the semi-arid Deccan Plateau districts that fare poorly in access to food.

Table 5.16: Status of Districts on Access Index of Maharashtra

Secure	Moderately Secure	Moderately Insecure	Severely Insecure	Extremely Insecure
Sindhudurg	Ahmadnagar	Osmanabad	Amravati	Nandurbar
Satara	Solapur	Gondiya	Yavatmal	
Ratnagiri	Nagpur	Aurangabad	Dhule	
Kolhapur	Thane	Chandrapur	Nanded	
Pune	Wardha	Bid	Gadchiroli	
Raigarh		Buldana		
Sangli		Jalgaon		
		Akola		
		Bhandara		
		Jalna		
		Hingoli		
		Nashik		
		Latur		
		Washim		
		Parbhani		

*****

Map 5.9: Food Access Map of Rural Maharashtra



6. Food Absorption

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 are utterly inadequate, particularly in rural areas. There are persistent gaps in human resources and infrastructure, disproportionately affecting the less developed rural areas. A significant proportion of hospitals do not have adequate personnel, diagnostic and therapeutic services and drugs. In a state like Maharashtra, 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 25 villages, which hardly serves the purpose in the light of the high pressure on limited resources. This compares poorly with a state like Kerala which has excellent health infrastructure in the rural areas (one PHC for every one and half villages). Lack of primary public health facilities forces the vulnerable populations to depend on private health services, often leading to indebtedness in rural areas (Table 6.1).

Table 6.1: Factors Determining Status of Absorption

India/States	Households Having Safe Drinking Water		No. of Villages per PHC		Households Having Toilet Facility	
	Value (%)	Rank	Value (no.)	Rank	Value (%)	Rank
India	78	–	27.6	–	21.9	–
Andhra Pradesh	80.1	9	18.9	6	18.1	9
Assam	58.8	15	43.1	15	59.6	2
Bihar	86.6	4	27.4	10	13.9	13
Chhattisgarh	70.5	11	39.4	13	5.2	17
Gujarat	84.1	8	17.3	4	21.7	6
Haryana	86	5	17.0	3	28.7	4
Jharkhand	42.7	16	58.1	17	6.6	16
Karnataka	84.6	7	17.5	5	17.4	10
Kerala	23.4	17	1.5	1	81.3	1
Madhya Pradesh	68.4	12	46.4	16	8.9	14
Maharashtra	79.8	10	24.6	7	18.2	8
Orissa	64.2	14	40.1	14	7.7	15
Punjab	97.6	1	26.2	9	40.9	3
Rajasthan	68.3	13	24.7	8	14.6	11
Tamilnadu	85.5	6	11.8	2	14.4	12
Uttar Pradesh	87.8	3	29.5	11	19.2	7
West Bengal	88.5	2	34.8	12	26.9	5

Source: Census of India, 2001 and Health Information of India, 2005.

Access to safe drinking water and sanitation is another important indicator of the health status of a population. Studies have shown that water and sanitation account for a substantial portion of the difference in infant and child mortality rates experienced by the rich and the poor (Leipziger et al 2003). Safe drinking water plays a key role in the body's use of consumed food. 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. Besides, more people are vulnerable to water-borne diseases (Gujja & Shaik, 2005). Empirical studies have shown that water quality is a big problem in rural areas (Krishnan et al, 2003). The availability and quality of potable water is a big factor that affects food insecurity. Almost two million children die each year because of lack of clean water and sanitation (UNICEF, 2007c). As there is no direct method of calculation of access to safe drinking water, we have taken access to tubewell, tap and handpump as safe sources of drinking water. In Maharashtra, 79.8 per cent of the households are having access to safe drinking water. It ranks tenth among the 17 major states of India on this count and is two percentage points above than the national average.

6.1 Primary Health Centres

In Maharashtra, only one district namely Gondiya has PHCs in more than half of its villages. At the other end, in as many as nine districts namely Satara, Solapur, Aurangabad, Jalna, Parbhani, Hingoli, Yavatmal, Chandrapur and Akola, less than a quarter of the villages have access to a primary health facility (Table 6.2 and Map 6.1). Even relatively developed districts, such as Satara, Solapur and Aurangabad, fall in the lowest category of PHC access.

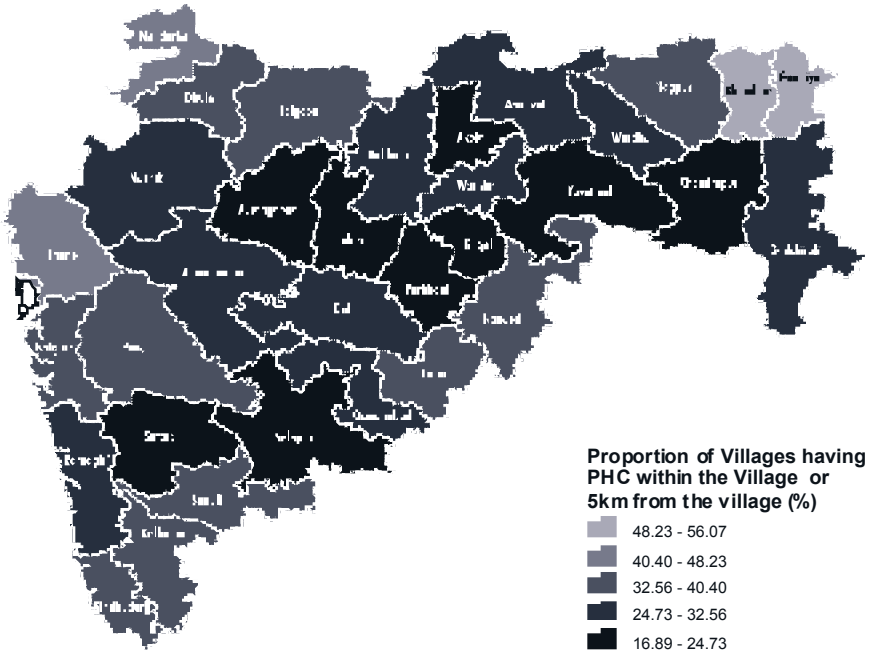
6.2 Safe Drinking Water

Table 6.2: Access to PHCs in Maharashtra, 2001

District	Value	Rank	District	Value	Rank	District	Value	Rank
Ahmadnagar	31.22	17	Hingoli	16.89	33	Pune	32.86	14
Akola	19.04	32	Jalgaon	33.94	12	Raigarh	35.25	11
Amravati	25.21	24	Jalna	23.75	25	Ratnagiri	29.78	18
Aurangabad	22.51	30	Kolhapur	39.88	6	Sangli	37.31	7
Bhandara	49.67	2	Latur	35.40	10	Satara	22.77	28
Bid	26.85	21	Nagpur	36.93	8	Sindhudurg	39.89	5
Buldana	31.99	16	Nanded	36.63	9	Solapur	22.67	29
Chandrapur	23.49	26	Nandurbar	47.63	3	Thane	45.24	4
Dhule	33.78	13	Nashik	29.00	19	Wardha	27.41	20
Gadchiroli	26.69	22	Osmanabad	32.24	15	Washim	26.49	23
Gondiya	56.07	1	Parbhani	21.31	31	Yavatmal	23.37	27

Source: Calculated from Census, 2001.

Map 6.1: Access to Health Services in Rural Maharashtra



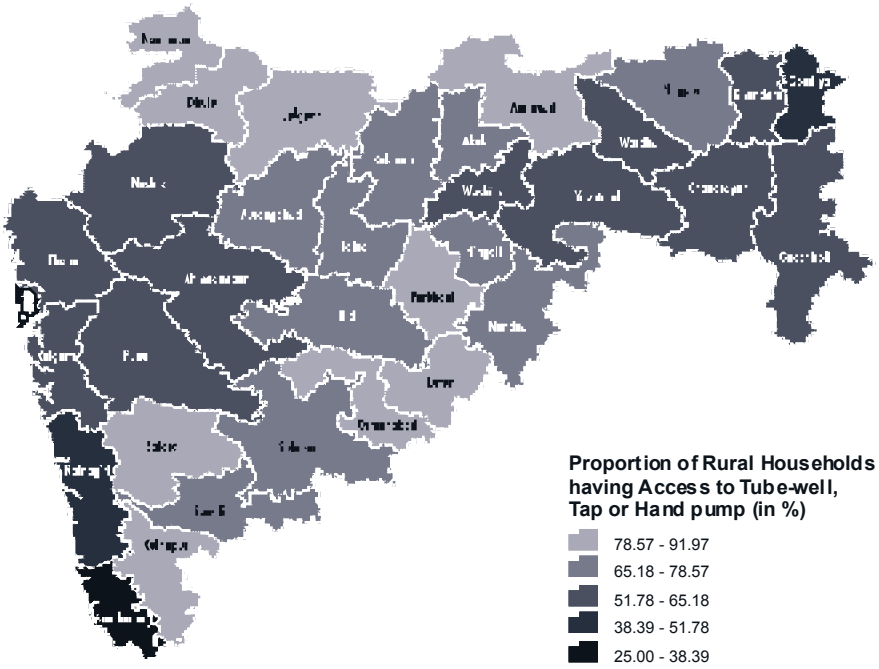
In Maharashtra, the coastal district of Sindhudurg ranks lowest in access to safe drinking water; it is the only one in the extremely low category. Other districts with very low to low access to safe drinking water are distributed across Vidarbha and Western Maharashtra, a rather surprising fact in the case of the latter given the generally high level of rural development in those areas (Table

Table 6.3: Access to Safe Drinking Water (in per cent of households) in Maharashtra, 2001

District	Value (%)	Rank	District	Value (%)	Rank	District	Value (%)	Rank
Ahmadnagar	53.47	28	Hingoli	71.43	15	Pune	64.41	20
Akola	75.99	12	Jalgaon	91.97	1	Raigarh	60.29	23
Amravati	83.40	6	Jalna	70.81	17	Ratnagiri	42.55	32
Aurangabad	70.90	16	Kolhapur	84.35	5	Sangli	76.41	11
Bhandara	62.19	22	Latur	84.58	4	Satara	81.47	8
Bid	77.22	10	Nagpur	74.27	13	Sindhudurg	24.99	33
Buldana	66.00	19	Nanded	72.45	14	Solapur	69.15	18
Chandrapur	57.89	24	Nandurbar	81.71	7	Thane	52.41	30
Dhule	87.17	3	Nashik	53.97	27	Wardha	64.18	21
Gadchiroli	56.77	26	Osmanabad	87.31	2	Washim	52.93	29
Gondiya	49.34	31	Parbhani	79.97	9	Yavatmal	57.43	25

Source: As stated in Table 3.4, Variable c1.

Map 6.2: Access to Safe Drinking Water in Rural Maharashtra



6.3 and Map 6.2).

6.3 Food Absorption Status

Based on the twin indicators of access to safe drinking water and primary health facilities, the food absorption index has been calculated and presented in Table 6.5 and Map 6.3.

Table 6.4: Status of Districts on Absorption Index of Maharashtra

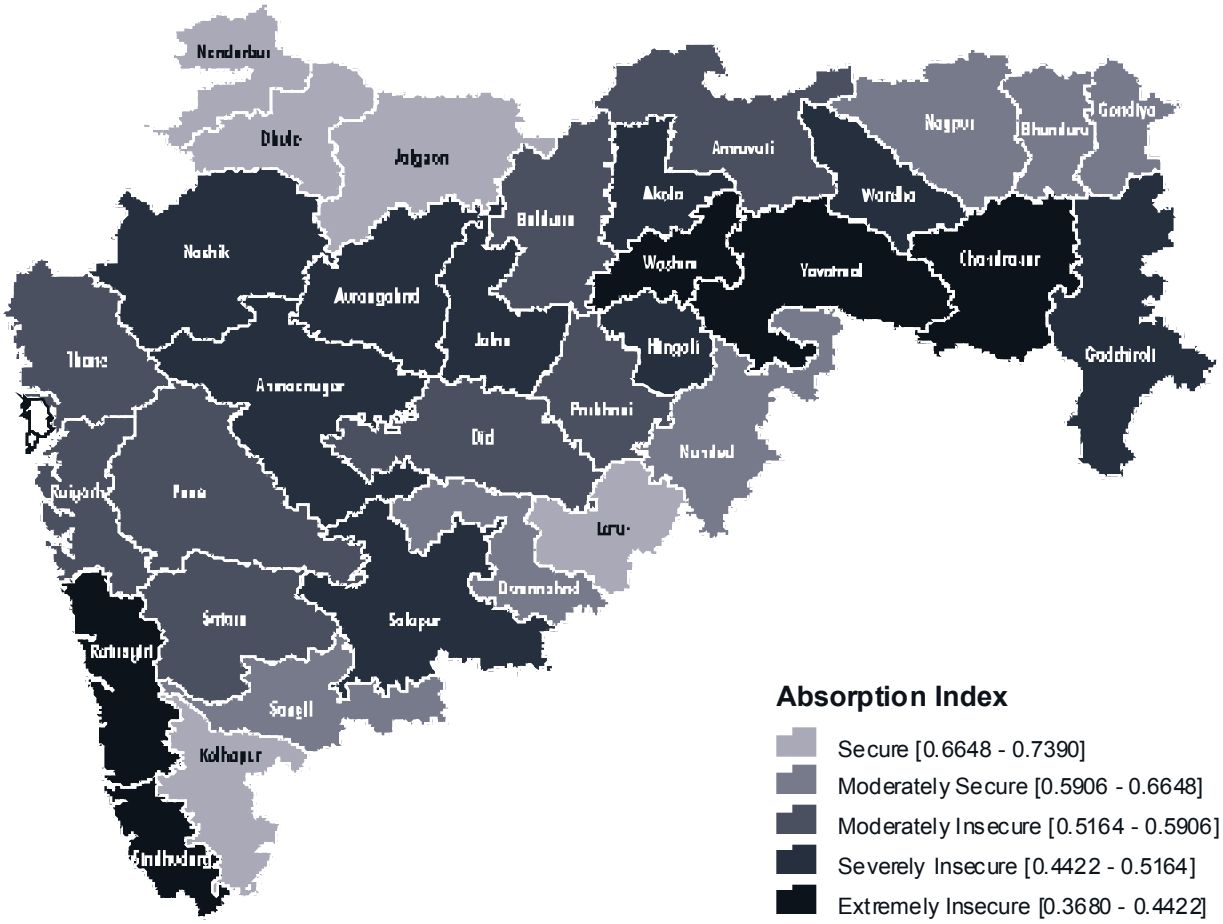
Secure	Moderately Secure	Moderately Insecure	Severely Insecure	Extremely Insecure
Nandurbar	Osmanabad	Amravati	Jalna	Chandrapur
Kolhapur	Bhandara	Bid	Akola	Yavatmal
Jalgaon	Sangli	Satara	Aurangabad	Washim
Dhule	Nagpur	Thane	Wardha	Ratnagiri
Latur	Gondiya	Parbhani	Solapur	Sindhudurg
	Nanded	Buldana	Ahmadnagar	
		Pune	Hingoli	
		Raigarh	Nashik	
			Gadchiroli	

Table 6.5: Indicators Used in the Construction of Absorption Index

District	Access to safe Drinking water		Access to PHCs	
	Value	Rank	Value	Rank
Ahmadnagar	53.47	28	31.22	17
Akola	75.99	12	19.04	32
Amravati	83.40	6	25.21	24
Aurangabad	70.90	16	22.51	30
Bhandara	62.19	22	49.67	2
Bid	77.22	10	26.85	21
Buldana	66.00	19	31.99	16
Chandrapur	57.89	24	23.49	26
Dhule	87.17	3	33.78	13
Gadchiroli	56.77	26	26.69	22
Gondiya	49.34	31	56.07	1
Hingoli	71.43	15	16.89	33
Jalgaon	91.97	1	33.94	12
Jalna	70.81	17	23.75	25
Kolhapur	84.35	5	39.88	6
Latur	84.58	4	35.40	10
Nagpur	74.27	13	36.93	8
Nanded	72.45	14	36.63	9
Nandurbar	81.71	7	47.63	3
Nashik	53.97	27	29.00	19
Osmanabad	87.31	2	32.24	15
Parbhani	79.97	9	21.31	31
Pune	64.41	20	32.86	14
Raigarh	60.29	23	35.25	11
Ratnagiri	42.55	32	29.78	18
Sangli	76.41	11	37.31	7
Satara	81.47	8	22.77	28
Sindhudurg	24.99	33	39.89	5
Solapur	69.15	18	22.67	29
Thane	52.41	30	45.24	4
Wardha	64.18	21	27.41	20
Washim	52.93	29	26.49	23
Yavatmal	57.43	25	23.37	27

Source: As stated in Table 3.4, Variable c.

Map 6.3: Food Absorption Map of Rural Maharashtra



The districts ranking extremely low in Food Absorption (an index of access to safe drinking water and to medical care) are Ratnagiri and Sindhudurg on the coast, along with Washim, Yavatmal and Chandrapur in Vidarbha. What is surprising is that the North-western districts of Jalgaon, Dhule and Nandurbar rank high. Nandurbar actually has the highest score in the index, rather unusual for a hill-forest region. It is likely that projects for safe drinking water and PHCs have been carried out in this district, but the extent to which such drinking water and health facilities are actually functioning needs to be ascertained.

*****

7. Addressing Food Insecurity in Maharashtra

Chapter 3 developed an index to show the ranks of districts by outcomes of food insecurity. The next logical step was to look at factors that contribute to making these districts prone to food insecurity. These factors were analyzed through the framework of Availability, Access and Absorption framework in chapters 4 to 6. In this chapter, all the factors that explain food security across districts of Maharashtra are combined to form a single index, called the Food Security Index (FSI).

Any strategy to improve the food security status must consider the regional disparities in the incidence of food and nutrition insecurity and develop location specific policies for clusters of hunger hotspots.

7.1 Food Security Index (FSI)

As expected the Food Security Index shows the two hill-forest districts, with a dominant ST population, Gadchiroli in the East and Nandurbar in the North-west, are in the lowest food security category of severely insecure. Nashik and Thane join Yavatmal and Nanded in the next lowest food security category. But what is important to note is that a large part of Vidarbha, other than Bhandara and Wardha, fall in the medium to lower categories of food security (Table 7.2 and Map 7.1).

These are districts of largely unirrigated agriculture, with a large proportion of agricultural labourers and Scheduled Caste population. In Maharashtra, these two often co-terminous social categories, along with the tribal population, constitute the most food insecure. Questions of irrigation, land to the landless and even non-farm enterprises become relevant in dealing with food insecurity in the vast semi-arid Deccan Plateau.

A large number of programmes dealing with all three components of food security, viz. availability, access and absorption, are being implemented in the state of Maharashtra. The analysis in this atlas can help to prioritize the geographical targeting of these programmes and suggest intervention that could improve food security by linking short-term access measures with long-term development measures.

7.2 Identifying Priority Districts

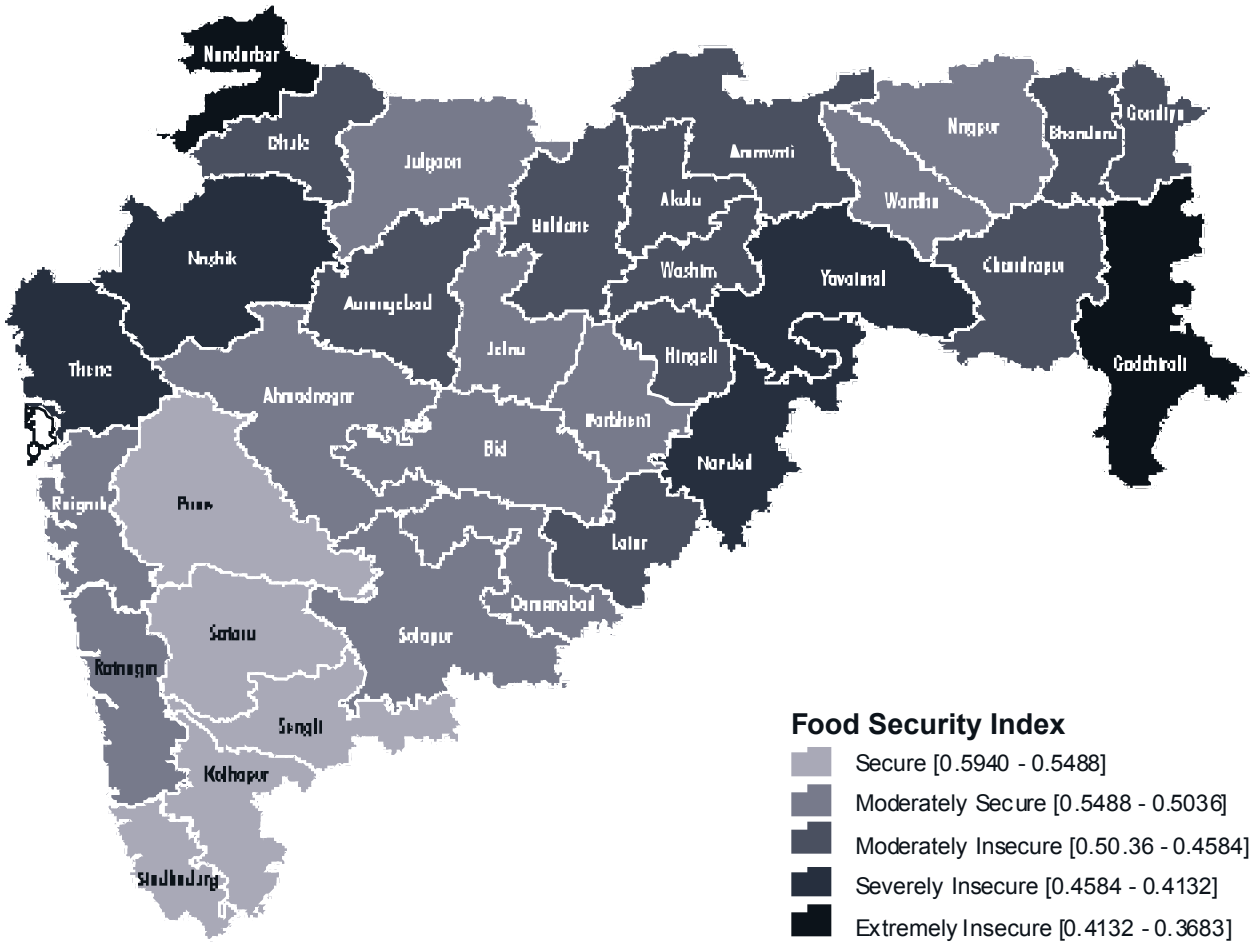
The food insecurity outcome index and food security index discussed earlier provides the option of prioritizing the developmental efforts in the most food insecure districts. The districts in the two lowest category that is, extremely and severely food insecure districts, in both the indices should be prioritized for developmental intervention for enhancing food security. There are three kinds of such districts - districts common in both FSI & FSOI; districts only by FSI and districts only by FSOI. These districts are presented with their ranks in FSI and FSO, criteria of selection and region in which they are located in Table 7.3.

Eight districts out of the total thirty three districts of Maharashtra have been identified as districts for food security priority interventions. Out of the eight, three districts are common in both FSI and FSOI; three districts have been identifed by only FSI and five districts have been selected by only FSOI.

Table 7.1: Ranks of Districts on Composite Food Security Index and its Components

Districts	Availability Index		Access Index		Absorption Index		FSI Index Value		FSOI	
	Index	Rank	Index	Rank	Index	Rank	Index	Rank	Index	Rank
Ahmadnagar	0.525	19	0.541	8	0.464	25	0.523	12	0.577	13
Akola	0.557	11	0.444	20	0.503	21	0.491	18	0.601	12
Amravati	0.51	21	0.403	28	0.588	12	0.469	25	0.485	24
Aurangabad	0.549	14	0.45	15	0.499	22	0.491	19	0.553	18
Bhandara	0.468	27	0.442	21	0.645	7	0.484	21	0.477	26
Bid	0.593	4	0.447	17	0.565	13	0.516	13	0.604	10
Buldana	0.512	20	0.446	18	0.540	17	0.484	23	0.483	25
Chandrapur	0.505	22	0.448	16	0.434	29	0.465	26	0.352	32
Dhule	0.443	28	0.399	30	0.670	4	0.459	27	0.494	23
Gadchiroli	0.312	33	0.379	32	0.450	28	0.368	32	0.286	33
Gondiya	0.44	29	0.479	14	0.619	10	0.489	20	0.437	27
Hingoli	0.584	6	0.425	23	0.462	26	0.484	22	0.555	17
Jalgaon	0.585	5	0.445	19	0.698	3	0.534	8	0.521	21
Jalna	0.629	2	0.428	22	0.508	20	0.508	16	0.500	22
Kolhapur	0.547	15	0.591	4	0.698	2	0.594	1	0.660	5
Latur	0.544	16	0.421	25	0.667	5	0.503	17	0.576	14
Nagpur	0.554	12	0.49	10	0.621	9	0.533	9	0.422	28
Nanded	0.47	26	0.395	31	0.609	11	0.456	28	0.420	29
Nandurbar	0.324	32	0.275	33	0.739	1	0.368	33	0.364	31
Nashik	0.505	23	0.422	24	0.451	27	0.455	29	0.576	14
Osmanabad	0.559	10	0.48	13	0.660	6	0.536	6	0.637	7
Parbhani	0.681	1	0.413	27	0.541	16	0.524	11	0.574	16
Pune	0.542	17	0.589	5	0.537	18	0.565	4	0.655	6
Raigarh	0.388	30	0.589	6	0.531	19	0.512	15	0.634	8
Ratnagiri	0.491	24	0.61	3	0.394	32	0.534	7	0.682	2
Sangli	0.598	3	0.563	7	0.635	8	0.587	2	0.629	9
Satara	0.554	13	0.615	2	0.560	14	0.585	3	0.670	3
Sindhudurg	0.536	18	0.617	1	0.368	33	0.549	5	0.767	1
Solapur	0.584	7	0.512	9	0.491	24	0.532	10	0.602	11
Thane	0.333	31	0.488	11	0.559	15	0.448	30	0.663	4
Wardha	0.569	9	0.483	12	0.497	23	0.514	14	0.394	30
Washim	0.582	8	0.42	26	0.428	31	0.475	24	0.547	19
Yavatmal	0.49	25	0.4	29	0.430	30	0.435	31	0.544	20

Map 7.1: Food Security Map of Rural Maharashtra



Map 7.2: Maharashtra: Priority District for Food Security Interventions

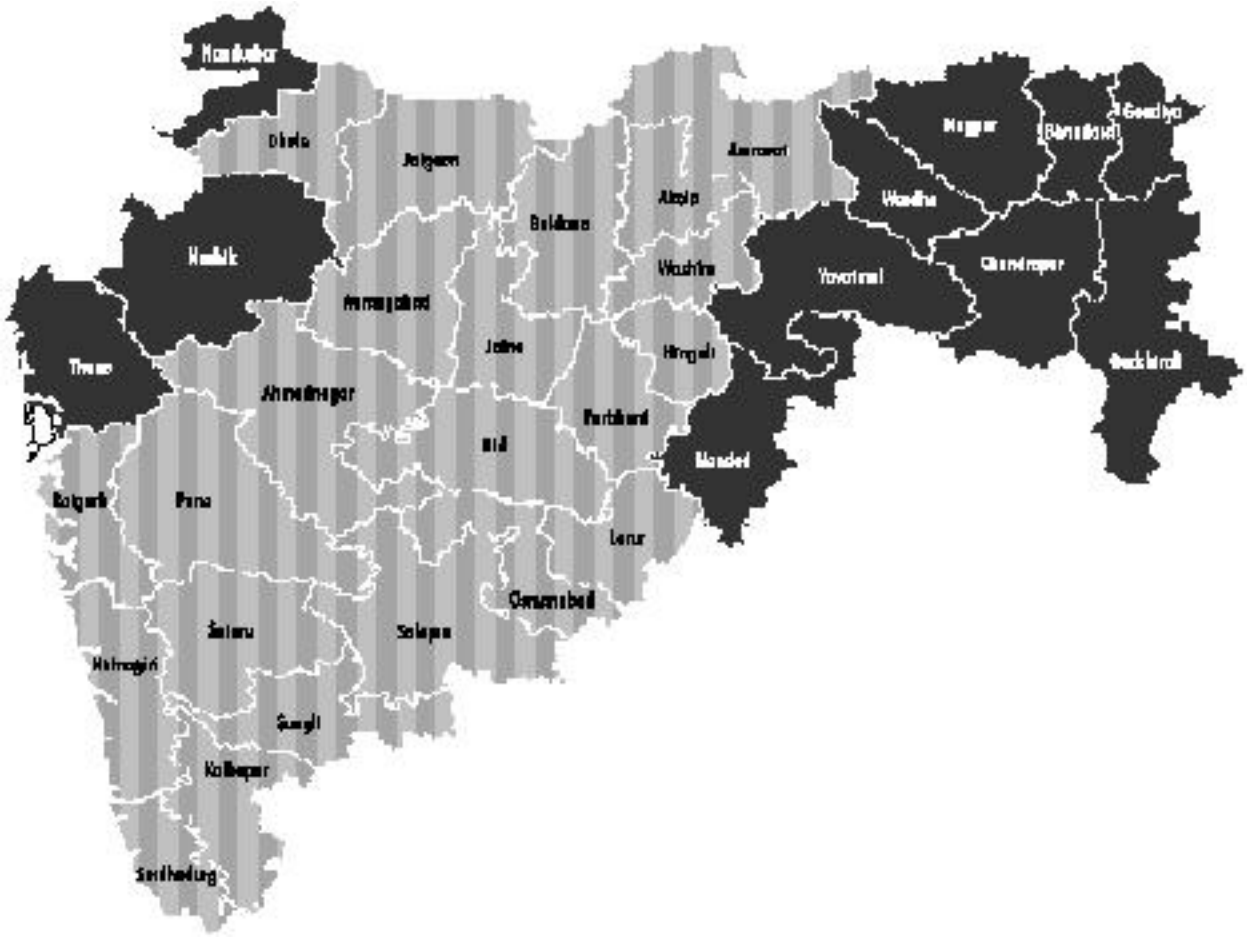


Table 7.2: Status of Districts in terms of FSI

Secure	Moderately Secure	Moderately Insecure	Severely Insecure	Extremely Insecure
Kolhapur	Osmanabad	Latur	Nanded	Gadchiroli
Sangli	Ratnagiri	Akola	Nashik	Nandurbar
Satara	Jalgaon	Aurangabad	Thane	
Pune	Nagpur	Gondiya	Yavatmal	
Sindhudurg	Solapur	Bhandara		
	Parbhani	Hingoli		
	Ahmadnagar	Buldana		
	Bid	Washim		
	Wardha	Amravati		
	Raigarh	Chandrapur		
	Jalna	Dhule		

Table 7.3: Priority Districts for Food Security Intervention in Maharashtra

Districts	FSI Value	FSI Rank	FSO Value	FSO Rank	Criteria	Region
Gadchiroli	0.368	32	0.286	33	Both (FSI + FSO)	Eastern
Nanded	0.456	28	0.420	29	Both (FSI + FSO)	Inland Central
Nandurbar	0.368	33	0.364	31	Both (FSI + FSO)	Inland Northern
Thane	0.448	30	0.663	4	Only FSI	Coastal
Yavatmal	0.435	31	0.544	20	Only FSI	Inland Eastern
Nashik	0.455	29	0.576	14	Only FSI	Inland Northern
Bhandara	0.484	21	0.477	26	Only FSO	Eastern
Chandrapur	0.465	26	0.352	32	Only FSO	Eastern
Gondiya	0.489	20	0.437	27	Only FSO	Eastern
Nagpur	0.533	9	0.422	28	Only FSO	Inland Eastern
Wardha	0.514	14	0.394	30	Only FSO	Inland Eastern

location wise, all these districts are concentrated in two pockets (Map 7.2). These districts not only have high under five mortality and under nutrition rate but also rank poorly in terms of availability, access and absorption indicators. They need urgent attention of government and policy makers.

7.3 Strategies for Promoting Food Security

The districts most beset by hunger and food insecurity have been identified in the earlier section. These are also the districts that call for priority intervention. The analysis of the earlier chapters suggests the measures and strategies that are needed for enhancing food security. Broadly, measures to improve availability must include improving irrigation and agricultural productivity. Farm incomes can

be improved through better rural connectivity. Access should be improved by policies for enhancing rural wages and thereby spending on food, improving the lot of agricultural labour, land re-distribution, and enhancing the status of women. There can be no two opinions on the need to expand the reach of public interventions.

The central and state governments have launched a number of schemes and programmes that are aimed at enhancing food security in the state. Some of them are recent and it is too early to see their impact, while some have been under implementation for some time. This section discusses the food security interventions in the state.

7.3.1 Enhancing Availability

More than a decade of low investment in agriculture, including agricultural research and infrastructure, has resulted in a relative stagnation in food output. With the present problems of spiraling food prices, there is a renewed emphasis on increasing food production.

Increasing Food Production: The National Food Security Mission

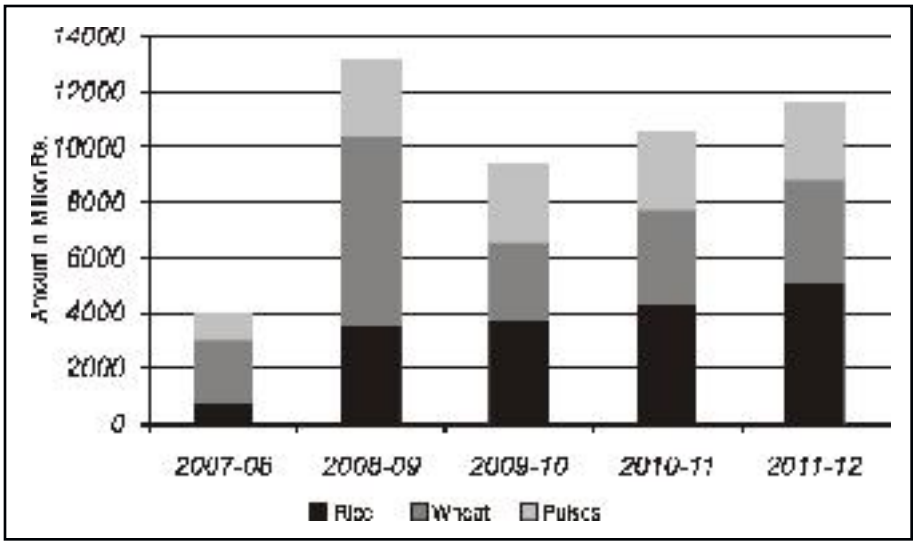
The dismal rate of growth in the agricultural sector has been a cause for concern - the sector grew at a meagre rate of 1.8 percent per annum during the nineties. This has been coupled with rising international prices as well as occasional wheat imports, bringing into question the food security of the country. With a view to increasing the rate of agricultural growth to 4 percent, the government has launched the National Food Security Mission (NFSM) entirely funded by the central government, with a total estimated outlay of over Rs. 50,000 million. The programme specifically aims at increasing the production and productivity of three crops: rice, wheat and pulses. Ongoing related schemes like the Integrated Cereal Development Programme (ICDP Rice/Wheat) and the Integrated Scheme on Pulses, Oilseeds and Maize (ISOPOM Pulse) would cease to operate in the identified districts once the relevant component of the NFSM comes into execution in the district.

The objective of the mission is to increase the production of rice by 10 million tons, wheat by 8 million tons and pulses by 2 million tons, by the end of the 11th Plan. The targets are to be achieved by restoring soil fertility and hence productivity, which would be complemented by increasing employment opportunities.

The mission would operate at multiple levels from the national level, to state and district levels. At the grass root level, the Panchayati Raj Institutions (PRIs) would have an active role and would be involved in the selection of beneficiaries and identification of priority areas and local initiatives.

The mission would be implemented in 133 districts for the rice component, 138 districts for wheat and 168 districts for the pulse component - all in identified districts of different states. In terms of target beneficiaries, 16 percent of the total allocation would be earmarked for Scheduled Castes under the Special Component Plan (SCP) and 8 percent would be earmarked for the Scheduled Tribes under the Tribal Sub-Plan (TSP). At least 33 percent of the fund would be utilized for small, marginal

Fig 7.1. Allocation Proposed under NFSM



Source: Economic Survey, 2007-08

and women farmers. Further, the allocation to the SC/ST farmers would be made in proportion to their population in the district.

The modality of implementation of the mission would be in the form of demonstration of an improved package at farmers' fields, assistance for production of hybrid rice, nutrient management for all the three crops, mechanization for sowing and weeding, and assistance for purchase of pump sets and sprinkler sets. Several capacity-building initiatives would also be undertaken which would be in the form of farmers' training in Farmers' Field Schools (FFS) and exposure visits to international organizations. For efficient information dissemination, help from print and e-media and other methods would be taken up as required. All these would be followed by rewarding the best performing districts on a set of indicators.

In the state of Maharashtra, districts identified to be developed under the NFSM rice and wheat components are provided in Table 7.4.

Table 7.4: Districts under NFSM in Maharashtra

Rice (6)	Wheat (8)	
Bhandara	Ahmednagar	Pune
Chandrapur	Aurangabad	Solapur
Gadchiroli	Dhule	
Gondia	Nagpur	
Nasik	Nasik	
Pune	Parbhani	

Box 7.1: National Policy for Farmers, 2007

The National Policy for Farmers is intended to help in rejuvenating the farm sector and bringing lasting improvement in the economic condition of farmers. The Government constituted the National Commission on Farmers in 2004 under the chairmanship of Dr. M.S. Swaminathan. Based on the recommendations made by the Commission in its Revised Draft National Policy for Farmers and the comments/suggestions received from various Central Ministries and Departments and State Governments, the "National Policy for Farmers, 2007" has been formulated and approved by the Government of India. The policy, among other things, aims to improve the economic viability of farming by substantially improving the net income of farmers in addition to improving productivity, profitability, land, water and support services and providing appropriate price policy, risk management measures.

The broad areas of the coverage of the recommendations include:

a. Human Dimension: In addition to production and productivity the economic well being of the farmers to be given prime importance.

b. Asset Reforms: To ensure that every man and woman, particularly the poor, in villages either possesses or has access to a productive asset.

c. Water Use Efficiency: The concept of maximizing yield and income per unit of water to be adopted in all crop production programmes, with stress on awareness and efficiency of water use.

d. Use of Technology: New technologies, which can help enhance productivity per unit of land and water, are needed: Biotechnology, information and communication technology (ICT), renewable energy technology, space applications and nano-technology to provide opportunities for launching an "Evergreen Revolution" capable of improving productivity in perpetuity without harming the ecology.

e. Inputs and Services: Good quality seeds, disease-free planting material, including in-vitro cultured propagules and soil health enhancement hold the key to raising small farm productivity. Every farm family to be issued with a Soil Health Passbook. Food security basket to be enlarged to include nutritious millets mostly grown in dry land farming areas.

f. Credit & Insurance: The financial services to be galvanized for timely, adequate and easy reach to the farmers at reasonable interest rates.

g. Single National Market: To develop a Single National Market by relaxing internal restrictions and controls.

An Inter-Ministerial Committee has been set up to operationalize the implementation of the policy.

The NFSM concentrates on irrigated foodgrains, wheat and rice, and pulses. Other than for pulses, non-irrigated crops have been ignored. The NFSM is aimed at revitalizing fertility in lands which have deteriorated. But rainfed crops, such as the various millets that are grown on hills and other drylands, do not come under its purview. In the context of the plateauing (and even decline) of yields in irrigated crops, it becomes even more important to pay attention to these rainfed crops and to increase productivity in currently rainfed areas. These are also areas of higher food insecurity. An increase in agricultural productivity in rainfed areas will substantially reduce the incidence of hunger in these areas.

Wastelands as CPRs

In the vast semi-arid Deccan Plateau a lot of the land is classified as "wastelands". These are actually various forms of common and government lands that have turned into "open access" lands. There is little or no community or government regulation of use, and no investment in regeneration of the production potential of these lands. As the pioneering work of N. S. Jodha (2000) shows, the poor rely substantially on these degraded common lands for a large part of their fodder and fuel, and even some food (vegetable) needs.

These degraded common lands could be brought under forms of Common Property Resources (CPRs). CPRs, however, can belong to the whole village or to a defined section of it. In the highly unequal and caste-structured Indian village, village CPRs are likely to be dominated by the upper-castes and classes. On the other hand, there could be a clear policy of allotting the CPRs to the poor, in a form of user rights, since it is the poor who disproportionately use these commons. Such CPRs for the poor would serve both goals of regenerating these resources and improving the food security of the poor. There has been much discussion on the possibility of giving out these wastelands for corporations to develop them. A better policy, one that would not only increase productivity of these resources but also improve the food security position of the poor, would be to lease these lands to the landless and other food-insecure groups to be developed as their common properties.

The productivity of these wastelands as they now stand is quite low. They are, for instance, suitable as grass and fodder lands for raising livestock. These dry lands are likely to have a comparative advantage in livestock and horticulture (C.H. Hanumantha Rao, 1994). Livestock itself is a sector that can provide higher employment per unit of income, and with milk and meat being superior products, their markets are not likely to face the constraints that grain markets faces. R. K. Sharma and Babu Jacob estimate that the employment elasticities of output for crops and livestock were 0.41 and 0.91 respectively, during the period 1972-73 to 1987-88 (Sharma and Jacob, 1997, p. 269). But by themselves these degraded open access lands cannot provide much income or support many animals. "..the observations from micro-level studies suggest that CPL (Common Pasture Land) can provide about 75 percent of the fodder requirements during the four months in monsoon season and about 50 percent during the subsequent two months and that too if the rainfall is reasonably good. For the remaining period, fodder requirements have to be met through crop-residue or market-purchase" (Amita Shah, 1997). It is no wonder that animals distributed to the poor through the Integrated Rural Development Programme (IRDP) did not survive in their hands.

What is needed is to transform what are effectively "open access" lands into CPRs of the poor. Investment support can be provided through food-based schemes to support employment of the poor in improving infrastructure and productivity. In defining access of the poor to CPRs, consideration needs to be paid once again to the separate rights of women. The reasons for this are discussed below.

A part of the wastelands has also been taken over by individuals or families of the poor,, as Milind Bokil (1991) points out, in the case of Maharashtra where *dalit* families have been encouraged to take over government lands. But in this case too there is a question of the low productivity of these lands. In the rain-fed conditions of the semi-arid Deccan, they need substantial investment even for one reasonable crop. Water harvesting structures, bunding and other land improvements are needed. This is another area for investment support, which can be tied up with MGNREGS. The difference from conventional Rural Works Programmes is that the asset creation would not be public and would be concentrated on those lands and assets that have been transferred to or otherwise belong to the poor.

Improving Connectivity

The rate of growth of rural incomes and reduction in rural poverty are strongly influenced by the provision of rural and district road connectivity. There is a close link between rural connectivity and growth, be it in the area of trade, employment, education or healthcare. States with poor connectivity are also states that report poor socio-economic indices. Improved connectivity between the growth production centres and the collection centres is vital for livelihood enhancements and that is possible only through the development of roads in remote areas.

While over the last five decades the length of rural roads has been increasing, there are still more than 250,000 villages in India (40 per cent) which remain unconnected. Other forms of rural infrastructure are also important as they help in widening the opportunities and choice of alternatives. Research into rural road investments suggests that the construction of a new road in a village raised the per capita income of households by 30 percent over a half-decade, after controlling for factors like household size and education (Deolalikar, 2001).

Pradhan Mantri Gram Sadak Yojana (PMGSY):

In an impact evaluation the following effects of the PMGSY have been observed (Ministry of Rural Development, Government of India):

1. Use of chemical fertilizers and HYV seeds has increased considerably on account of their decreased transportation cost that formed a fair portion of their total cost.

2. An increase in the ownership and use of farm implements by the people has been observed.

3. The farmers get a higher price for their products due to better access to the wholesale market.

4. There has been substantial increase in dairy and poultry production in the villages which are located in close proximity to the newly constructed roads.

5. There has been substantial increase in employment opportunities both in agricultural and non-agricultural sectors in villages located close to the roads constructed under PMGSY.

6. Substantial achievements have also been made on the health front. The frequency of health workers visiting the village has increased, as have institutional deliveries, and villagers have better access to health facilities.

7. The enrolment rate has increased due to better accessibility to educational institutions.

8. An increase in land prices has been observed and many petty shops have come up on the road side.

Bharat Nirman: Rural Roads

Bharat Nirman is a plan for action in rural infrastructure that started in 2005 and end in 2009. Under the scheme, action is proposed in the areas of irrigation, roads, rural housing, rural water supply, rural electrification and rural telecommunication connectivity, in partnership with the state governments and the PRIs.

As part of the programme, the government intends that by the end of the financial year 2008-2009, every village of over 1000 population, or over 500 in hilly and tribal areas, has an all-weather road. To achieve the targets of Bharat Nirman, 146,185 kms of road length is proposed to be constructed by 2009. This will benefit 66,802 unconnected eligible habitations in the country. To ensure full farm-to-market connectivity, it is also proposed to upgrade 194,132 kms of the existing associated through routes.

To sum up, the keys to increase availability or production factors in Maharashtra are to increase production and productivity in conditions of rainfed farming on hill slopes and in the Deccan plateau. The increase in production should also bring about an increase in incomes, thus also improving access to food. Small scale irrigation, watershed management, high value crops and improved communications all have a role to play. In the Deccan plateau there is a need to diversify cash crop production so as to reduce dependence on just one crop, the price of which might vary substantially from year to year.

7.3.2 Improving Access to Food

A policy implication emerging from the indicators used for enhancing food security is the need for betterment of the plight of the vulnerable populations, particularly the Scheduled Tribes and Scheduled Castes. It would be observed that like most other states, the tribal population in Maharashtra also has a close association with the forests. These Scheduled Tribes, particularly the primitive tribal groups, have faced a history of discrimination and due to their locational disadvantage, they have remained deprived of facilities. The Forest Rights Act seeks to address such groups (see Box 7.2). A proper

development policy for forest-dwellers will improve their food security. The Forest Rights Act, granting tenurial security, in conjunction with the Panchayats (Extension to the Scheduled Areas) Act (PESA), accepting the role of Gram Sabhas and Gram Panchayats in managing forest resources, should help in framing and implementing appropriate development policies in the food insecure forest areas of the state.

Access Measures

The access measure in Maharashtra, as in other states, has been along the following lines:

1. The provision of low-priced foodgrains, as a method of subsidizing the consumption of the poor. This, done through the Public Distribution System (PDS), has undergone some changes with the current Targeted PDS, where low prices are charged only for Below Poverty Line (BPL) households.
2. Food for Work schemes now carried out under the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA).
3. The mother and infant supplementary feeding programme through the ICDS.
4. The Mid-day Meal Scheme for children in government-run schools.

The latest (2004-05) NSS Round gives information on the extent to which these schemes reach the poor in Maharashtra, and thus contribute something to food security, though it does not show us how much they add to food entitlements.

In Table 7.5 we have also separately included "nearly poor" households, i.e. those whose per capita consumption level is within 10% above the poverty line. In both ICDS and the Mid-Day Meal Scheme, the performance in rural Maharashtra is better than in rural India as a whole. Nevertheless, the lower reach of food-based programmes to the poor, as revealed by NSSO figures, should be contrasted with the generally high reach shown by official government figures. The reach of ICDS, mid-day meals in schools is routinely reported by government agencies to be close to or exceeding 100 percent.

What is surprising is the rather low reach of employment schemes (Food for Work). However, If the Maharashtra figure is broken down by region, it appears that this is a regional phenomenon. In the Inland Central region (i.e. the southern part of Western Maharashtra) the reach of the Employment Assurance Scheme (EAS) work is for 19.3 percent of poor and near-poor households together. In the Eastern region (i.e. the forest area of Vidarbha) there is little EAS work, reaching just 1.7 of poor households and no near-poor households.

The index of public interventions is calculated by combining mid-day meal scheme and ICDS. The objective of these public interventions is to make up for shortfalls in food and other entitlements that households and individuals require in the usual working of the socio-economic system. Consequently

Table 7.5: Percentage share of Poor and Nearly Poor Households who have Ration Cards or Benefited from Various Schemes in Rural Maharashtra (2004-05)

	Ration card	Food for work	Annapoorna	ICDS	Midday meal
Poor Households					
Maharashtra	79.5	2.5	0.4	22.5	42.6
All-India	80.0	4.2	1.2	8.8	33.2
Nearly Poor Households					
Maharashtra	81.1	4.0	0.2	16.1	34.8
All-India	82.9	2.8	1.1	6.7	29.5

Source: Calculated from NSS 61st Round, 2004-05 Unit Level Data

Box 7.2: Improved Targeting in the Public Distribution System

The Targeted Public Distribution System is perhaps the largest food safety net in the world. Yet, as surveys have revealed, its success is tarnished by several shortcomings. A pilot project launched by WFP in collaboration with the state government seeks to address these through the use of new technologies. The project aims to strengthen the identification and verification process and comprehensively plug the loopholes in TPDS. The project is being implemented in Rayagada district of Orissa.

The project involves the following: -

- **Biometric ration cards (Iris and finger print):** to ensure that all ghost and duplicate cards are removed from the system.
- **Distribution of new ration cards against biometric validation:** to remove the problem of shadow ownership at the ration card distribution stage.
- **Bar-coded coupons:** to prevent recording of off-take without the beneficiary's agreement and also check shadow ownership of coupons.
- **Smart cards installed with a point of sale device (PoS):** to prevent incorrect off-take recording and shadow ownership of ration cards.
- **Strong management information system:** to improve governance and enhance effectiveness of monitoring by providing more relevant and real-time information.
- **Web based interface:** to track and monitor progress.

The project has helped in improved management and targeting of TPDS to the beneficiaries and has a great potential for replication elsewhere in the country.

the index of Public Interventions should have a higher value in those that are relatively more food insecure. That, however, is not the case in Maharashtra (See Table 7.6 and Map 7.3). One can see from map – that the index value is not accessarily higher in the worse of districts. It is likely that political influence play more of a role in determining index of public interventions rather than poor food security.

Table 7.6: Index of Public Interventions in Maharashtra

District	Index	Rank	District	Index	Rank
Ahmadnagar	0.640	14	Nanded	0.664	9
Akola	0.647	11	Nandurbar	0.671	7
Amravati	0.650	10	Nashik	0.646	12
Aurangabad	0.518	27	Osmanabad	0.762	1
Bhandara	0.757	2	Parbhani	0.671	6
Bid	0.607	19	Pune	0.411	33
Buldana	0.617	16	Raigarh	0.601	21
Chandrapur	0.695	5	Ratnagiri	0.499	30
Dhule	0.579	24	Sangli	0.512	29
Gadchiroli	0.514	28	Satara	0.598	22
Gondiya	0.668	8	Sindhudurg	0.561	26
Hingoli	0.602	20	Solapur	0.591	23
Jalgaon	0.640	13	Thane	0.563	25
Jalna	0.612	17	Wardha	0.610	18
Kolhapur	0.620	15	Washim	0.497	31
Latur	0.706	3	Yavatmal	0.703	4
Nagpur	0.461	32			

Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS)

The Mahatma Gandhi National Rural Employment Guarantee Scheme (MGNREGS) has been devised as a public work program and has a key role to play in providing assured employment to one person in each household for 100 days per year. The major objectives of this scheme are to provide income security through employment guarantee; reduce/check distress migration from rural to urban areas; and, in this process, also to create durable assets in villages, leading to overall development of the rural economy; and empowerment of rural women through the opportunity to earn income independently and to participate in social groups.

MGNREGS is based on the National Rural Employment Guarantee Act (NREGA). The Act came into effect in 200 selected (backward) districts of the country on February 2, 2006 and was extended to 130 more districts from April 1, 2007. Now (April 1, 2008) the Government of India has decided to extend MGNREGA to all rural areas of all districts of the country. The Act provides a legal guarantee of 100 days of wage employment in a financial year to one person of every rural household whose adult members volunteer to do unskilled manual work at the minimum wage rate notified for agricultural labour prescribed in the state or, in the event that employment is not provided, to give the person an unemployment allowance.

Map 7.3: Status of Public Interventions in Maharashtra

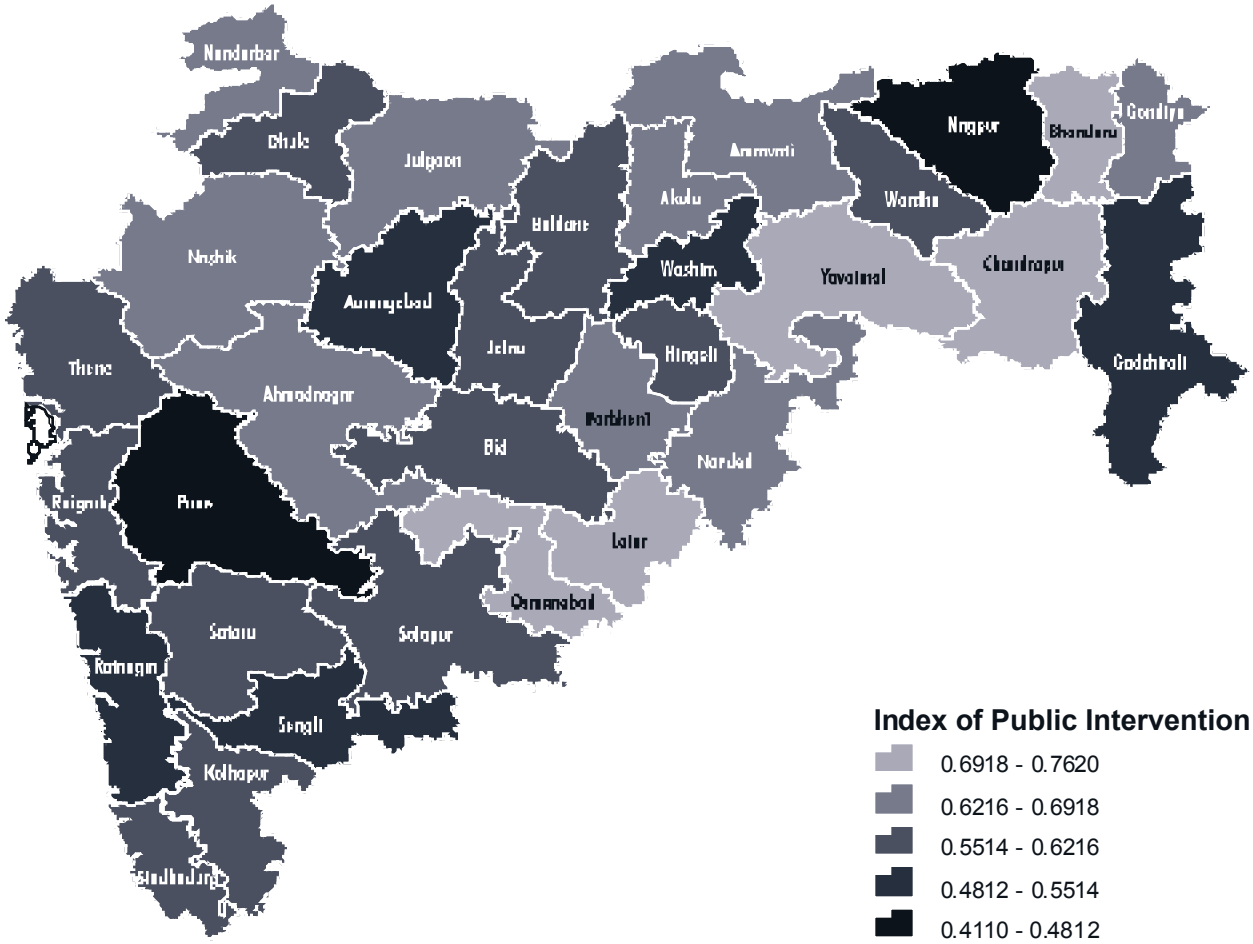


Table 7.7: MGNREGS Performance, All India, April 2010

National Bulletin	
Households Demanded Employment	52.9
Households Provided Employment	52.5
Persondays (in millions)	
Total	2835.9
SCs	864.5 (30.5%)
STs	587.4 (20.7%)
Women	1364.0 (48.1%)
Others	1384.0 (48.8%)

Source: http://nrega.nic.in, April, 2010.

The overall performance of MGNREGA is quite impressive. Of the 52.9 million job card holders who demanded work under the scheme, 52.5 million have been provided employment. As per the information reported on the government website, the scheme has therefore been able to provide employment to almost all the people among the job card holders who demanded work. Under this scheme, people are mainly provided with work related to creating or improving rural connectivity, water conservation, land development, drought proofing, micro-irrigation, renovation of traditional water bodies, land development, etc.

A large number of the beneficiaries under the scheme are women: close to 48 per cent of them as on March, 2010. As pointed out elsewhere in the report, women spend more of their income than men on essential consumption needs of the family, education of children and health care requirements, all of which are supportive of improving the nutritional status of their households.

It is worthwhile noting that a large share of the earning received from the MGNREGS works have been utilized for food-related expenses. A study undertaken by the IHD has actually documented this finding regarding the contributions from the MGNREGS being expended by the villagers on food related consumption needs (Box 7.3).

The participation of others in MGNREGS employment in Maharashtra (Table 7.8) is quite high, In fact, the proportion is higher than the all-India proportion. The proportion of women in this employment is also higher than the all-India level. On the other hand proportion of SCs & STs persondays is quite low in comparison to the all-India level.

Reports show, as would be expected, that there is corruption in the running of NREGS (CSE, 2008). This could be reduced through organization of the workers in these schemes, use of the Right to Information (RTI), and social audits etc. Such measures would increase the impact of the scheme on incomes and food security. Nevertheless, there can be no doubt that MGNREGS, by increasing the incomes of the poorest, is already having a major impact on food security.

Box 7.3: MGNREGA and Food Security

A recent study done by the Institute for Human Development to evaluate NREGA's performance in Bihar and Jharkhand indicates that beneficiaries of the scheme are spending a major part of their earnings from NREGA on food-related consumption items. In Bihar, 67 per cent of the earnings from NREGA is being spent on food while in Jharkhand, the percentage is 71. However in case of Scheduled Tribes and Scheduled Castes, who are generally more vulnerable to food insecurity because of low and irregular income, the spending on food from earnings received for NREGS work is more than the state average. Given the findings of the study, one can suggest that NREGA can be a safety net for the food insecure population.

Percentage of Income from NREGA Spent on Food and Related Items

	Bihar	Jharkhand	Total
Upper Caste	51.29	89.16	73.31
OBC I	62.62	68.13	63.64
OBC II	72.62	68.69	71.28
SC	68.7	75.68	69.65
ST	84.94	66.24	66.85
Total	67.3	71.31	68.6

Source: Understanding the Process, Institutions and Mechanism of Implementation and Impact Assessment of NREGA in Biharand Jharkhand, *Institute for Human Development, Delhi, March 2008.*

Table 7.8: MGNREGA Statistics of Maharashtra, March 2010

Households Demanded Employment	365357
Households Provided Employment	362126
Persondays (in millions)	
Total	14.3
SCs	1.0 (7.0%)
STs	1.8 (12.7%)
Women	7.0 (49%)
Others	11.4 (80.3)

Source: http://nrega.nic.in, April, 2010.

Empowerment of Women

From the analysis of variables affecting overall food security (FSI) in foregoing discussions, it emerges that female literacy in rural areas is the most significant factor determining food security of the rural population. This can be corroborated by the fact that most of the districts in the most food insecure category rank very poorly in terms of rural female literacy. Thus, it is imperative that girls' literacy be prioritized and all barriers to their access to education be effectively tackled. This should be coupled with the provision of quality education, especially for girls from the poor and marginalised communities.

Another policy implication from the indicators is the need for reducing the dependency ratio in order to improve food security. All the food insecure district is in terms of outcome indicators and ten out of eleven food insecure districts in terms of overall indicators have high dependency ratio. Improvement in female literacy no doubt will reduce it as both are closely related but a conscious effort to propagate small family norm should also be made.

The food insecure are usually thought to be non-bankable, or not credit-worthy. But they do access credit - that of the moneylender at what are very high effective rates of interest, above 10 percent per month. They frequently end up in inter-linked market transactions – selling their advance labour or NTFP for much less than market prices, with implicit interest rates for credit far above those otherwise on the credit market alone. Such inter-linked market transactions often occur at times of acute distress - when medical emergencies require immediate credit, or when drastic falls in the ability to acquire food lead to a need for credit. In such situations, if credit were available, inter-linked market transactions will not be necessary.

It hardly needs repeating that financial services for the poor, both savings and credit, are required for the poor, both to enable consumption smoothening and to utilize market opportunities. Whether through the Indian SHG-model or the Bangladesh Grameen Bank model, micro-financial services need to be provided. Through an increased use of educational facilities and of credit to utilize growing market opportunities, micro-finance programmes can link increased food security with development. The food security impact of micro-finance is increased by its also contributing to enhancing women's agency in the household.

In a more general sense, what can be said is that women's empowerment is directly related to improved food security. One key factor in empowerment can be the acquiring of land rights supplemented by access to training for new technologies, and crops and to finance.

Historically, other than in China, land reform has excluded women. But in some second-generation land reform movements in India (e.g. the Bodh Gaya movement of the 1980s) women raised the demand for land to be allotted in their names. “We had tongues but could not speak, we had feet but could not walk. Now that we have land, we have the strength to speak and walk” (Poor peasant women of Bodh Gaya, 1987); and: “We were there in harvesting the fields. We were there in carrying ploughs and snatching arms from the zamindar’s goondas. Why, when the land is distributed, do we not get our independent rights to land?” (Dalit women’s meeting, village Basuhari, Bihar, 3 September 1990, both in Kelkar, 1992). It is now recognized that women’s ownership of land is necessary to stimulate their labour and investment, and use their managerial talents (Agarwal, 1994). More particularly, in a situation of high male out-migration, as is characteristic of the dry regions of India and China, women’s ownership of land becomes a necessary condition for adequate use of credit and necessary flexibility in management of farm resources.

Scheduled Tribes

As would be expected, the tribal population in Maharashtra has a close spatial correlation with the forests. These Scheduled Tribes, particularly the primitive tribal groups, have faced a history of discrimination, and due to their locational disadvantage, they have remained deprived of facilities. The Forest Rights Act seeks to address such groups (see Box 7.4).

Box 7.4: Innovative Food Security Initiatives: The Food for Work Programme in Tribal Development Projects

Blessed with bountiful natural wealth and rich in human resources, the forested and tribal- dominated areas in the country are, nonetheless, among the poorest and severely food insecure areas. They are characterized by degraded natural resources, stark poverty, chronic hunger, high indebtedness and heavy out-migration. For the sustainable development of some of these regions, Tribal Development Programmes are being implemented in the states of Chhattisgarh, Jharkhand and Orissa. These were launched by the state government with the objective of ensuring household food security and improving livelihood opportunities based on the sustainable and equitable development of natural resources. The programmes are supported by the International Fund for Agricultural Development (IFAD) and the World Food Programme (WFP). The latter provides food assistance for a food for work component.

Given the abysmal poverty in the area, it is no surprise that the Food For Work (FFW) activity has become enormously popular. Payment for FFW includes a cash component and 3 kgs of grains (earlier pulses were also included). The programme, based on the performance of manual labour, is self-targeting towards the poor. It provides 70 days of work in the lean season when food insecurity is high.

Participatory Processes And Community Ownership

The point of departure in this programme, compared to other government programmes is the philosophy that the poor should be enabled to overcome their own poverty. This principle is woven intrinsically into all processes. To this end the project stresses the participation of the poor, community ownership and capacity building. Food is given to the community and they take the decisions. Inclusion of the most marginalized begins with the planning. All activities are discussed in the Gram Sabha. What activity should be taken up? What are the likely benefits? Who will benefit from the creation of the asset? How many people will get work? All these questions are debated and decided by the community. The project facilitates them in prioritizing, planning and implementing the plans.

The project shows how a simple activity like providing food as wages for work can become a kaleidoscope reflecting all the pulls, pressures, and dynamics of village life. This would not have been the case had it been a top-down programme where people had little or no role in decision-making. That not being the case, and all decisions now being taken in the Gram Sabhas, they have become sites of deep contestation. Valuable lessons in collective decision-making, negotiating, handling conflicts and targeting are being learnt.

The most marginalized are for the first time in their lives finding a platform for articulating their views. It is for this reason, that most community assets created under the programme are located so as to benefit poor hamlets and households and there is a significant impact on the food security of a desperately poor population living in remote and inaccessible areas.

Food for Work Activities

Tribal communities share a symbiotic relationship with forests that are a major source of food, nutrition and livelihoods. Empowering the community to engage in forestry-related activities has led to increase in yields of NTFPs and enhanced food availability.

The list of activities taken up under FFW is very long and, inter alia, includes land development, earth-bunding, stone-bunding, gully-plugging, pond construction and restoration, backyard plantations, plant nurseries, digging wells and building canals, trenches and check dams. These activities have helped to irrigate large areas. For the first time people have been able to get a second crop of wheat apart from the single rain-fed crop of rice that they used to harvest earlier. Many farmers have cultivated vegetables for the first time in generations. 'Neither our fathers nor our grandfathers ever cultivated these crops' they say with obvious pride.

In some villages, as for instance in Semra in Chatisgarh, under the food for work programme, villagers have almost literally moved mountains: They dug a well that has been lined with massive boulders they hauled from nearby hills. Apart from providing work and food for a large number of the poorest, it has helped ease the problem of drinking water for them and their livestock.

Enhanced Production and Productivity

There has been a big boost in production in many villages. In village Sagasai in Jharkhand for instance, paddy production takes place by the traditional 'broadcast' method. However, as a result of new sources of irrigation and water-harvesting, paddy production through transplantation has become possible. This has doubled yields, enhanced incomes and ensured food security.

Demand-driven approaches that give play to people's initiatives throw up as many diverse ways of doing an activity as the activities themselves. They draw on people's intuitive knowledge of local conditions, their creative urges and their innate skills in a way no top-down programme can. In village Ghangari, in Chhattisgarh, bunding was taken up around fields of the poor. In addition, they had the innovative idea of planting arhar (a pulse rich in protein) on the bunding. This not only utilized the land which would otherwise have gone waste, but the roots of the plant also strengthened the bunding which often gets washed off in the rains, because the fields are situated on a slope.

Impact on Migration and Indebtedness

Ask anyone what has been the impact of the Food For Work programme, and if the first answer is 'people do not go hungry anymore', the second will certainly be, 'people have stopped migrating for work'. Migration has stopped almost totally, particularly distress migration to far-off areas. In Ranchi, the capital city of Jharkhand, it is tragic, if common, to see hordes of adolescent tribal girls standing by the main square, waiting for labour contractors who entice them with promises of employment. In project areas, migration of adolescent girls from the Ho tribe used to be a common phenomenon. This has almost stopped now. The impact has not been even across the project areas, but there is little doubt that it is one of the most important positive outcomes of the programme.

The other significant impact has been on indebtedness. In fact, the main 'casualty' of the project has been the moneylender. Self-help groups (SHGs) have mushroomed in the project areas and as their lending operations expand, the business of the moneylender has been shrinking.

Strengthening of Local Institutions

The most intangible, but the most critical impact of the Food For Work programme, and one that holds the promise of sustainability, has been the strengthening of people's grass root level institutions; particularly the Gram Sabha and SHGs. As one young man in a village in Ranchi said: 'Earlier our village assembly used to meet only for settling disputes between families, or for religious purposes, but never to discuss development issues. Now we regularly meet to discuss what we should do for the progress of the village. Very often women outnumber men in the meetings.'

A woman in Kalahandi district of Orissa said, "Initially, few people would come to the project meetings; in fact meetings frequently had to be adjourned for lack of a quorum. Now that people are seeing the benefits of the programme, the attendance has

swelled.'

The lessons learnt by the village community in decision-making, handling, distributing and monitoring the food for work activity has had visible positive spin-offs on other programmes. The impact on improved functioning of the ICDS and schools, for example is in evidence in several villages. In a village in Koraput district in Orissa, the women say, 'the anganwadi worker used to come to the centre only once a week. Now since the OTELP (Orissa Tribal Empowerment and Livelihood Project) started, she has been coming regularly because she knows she is accountable to the Gram Sabha'.

Women's SHGs have become vibrant vehicles of change. They are empowering women in many remarkable ways. For one, they are helping women to become financially sound through income generating activities. The enhanced availability of water as a result of FFW activities has enabled them to take up diverse income-generating projects. Some women have taken up vegetable cultivation; others are engaged in aquaculture. At the same time, SHGs have helped women develop confidence to challenge regressive social norms and attitudes.

The projects are being implemented in the most poverty stricken belt of India. Wherever there is poverty, there is alienation, strife and revolt. In all this the Food For Work programme has proved invaluable in building trust and confidence and has taken care of the primary need of people of food with dignity. In the words of a young labourer, it is a vardan or a 'gift of God".

Srivastava, N. (2006)

The high level of forest areas in most food insecure districts shows the importance of a proper development policy for forest-dwellers. The Forest-Dwellers' Rights Act, granting tenurial security, in conjunction with the Panchayats (Extension To The Scheduled Areas) Act (PESA), and accepting the role of Gram Sabhas and Gram Panchayats in managing forest resources, should help in framing and implementing appropriate development policies in the food insecure forest areas of the state (see Box 7.5).

The report has pointed to the hill-forest districts, e.g. Nandurbar, Gadchiroli and Thane, as the most food insecure districts in Maharashtra. In Nandurbar and Thane, there are high levels of agricultural labourers. Their problems in acquiring land are similar to those of other landless. But there is also scope for increasing productivity in the poor soils of the uplands – through developing irrigated patches in the valleys, improving moisture retention on the slopes, and increasing the value of the mix of crops grown on slopes. A study in Koraput showed that even a small plot of irrigated rice land (in the valley) could make a substantial difference to food security (Sharadini Rath, 2003).

A similar study of the IFAD Tribal development projects in AP showed that building small check dams to create pockets of irrigated paddy land could make a substantial difference to households, and shift them from mere subsistence cultivation to accumulation. Further, the transformation of upland cultivation with a switch to a mix of commercial crops could also begin the process of accumulation.

Consequently, increasing agricultural productivity through irrigation, water-retention schemes, etc. and the cultivation of higher-value commercial crops in uplands, has a role to play in improving food security in the insecure districts. Since the food insecure districts have a higher proportion of cultivators,

Box 7.5: The Forest Rights Act

The Scheduled Tribes and Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 was promulgated towards the end of 2006 with a view to correcting the injustices done to the forest dwelling Scheduled Tribes. The Act recognizes and vests forest rights and occupation in forest land in forest-dwellers who have been residing in such forests for generations but whose rights could not be recorded. It also provides for recognition of forest rights of other traditional forest-dwellers provided they have primarily resided in and have depended on the forest or forest land for bona fide livelihood needs for at least three generations (25 years each) prior to 13th December 2005.

The Act has a number of significant provisions in the interest of the tribals and forest-dwellers. For the purpose of recognition of forest rights, the Act provides for a ceiling on occupation of forest land to the area under actual occupation not exceeding an area of four hectares. Importantly, no member of a forest-dwelling tribe or traditional forest-dweller shall be evicted or removed from forest land under one's occupation until the recognition and verification process is completed. Besides, right of ownership-access to minor forest produce, which has been traditionally collected within or outside village boundaries, has been recognized. With implications on Rehabilitation and Resettlement (R&R) issues, the Act recognizes the right to in-situ rehabilitation, including alternative land in cases where they have been illegally evicted or displaced from forest land of any description without granting their legal entitlement to rehabilitation prior to 13th December 2005. The Gram Sabhas have been designated as the competent authority for initiating the process of determining the nature and extent of individual or community forest rights (Government of India, 2007a).

The Act should go a long way in protecting the rights of the forest dwellers, particularly the tribal population and help in building up their livelihood, at the same time contributing in terms of conservation of forest resources. However, it has been criticized on a number of grounds. One, the Act requires the target population to live 'in' the forests, which could be interpreted in terms of areas 'recorded' as forests. This deems to exclude a vast majority of those forest-dwellers who live in areas recorded as revenue lands but cultivate forest lands and use forest resources. Secondly, investing Gram Sabhas with the power to decide the rights and grants permits may open the doors for corruption and abuse of power, as land ownership rights are seldom documented in such areas. Importantly, the Act does not adequately answer how the vital balance between tribes and forest systems will be maintained. There are also concerns of the Act's impact on the Wildlife Protection Act, passed in the same year.

Despite these criticisms, the very fact that the intent is to provide land ownership to the original inhabitants means that the equity issue gets addressed to a great extent. It is expected that the ownership would lead to better forest conservation and hence more environmental sustainability.

increases in agricultural productivity will have a direct effect in improving food security. The question is not one of diversification of lands where rice is cultivated. It is necessary to maintain existing levels of rice production for farmers in the uplands, as a reduction of own rice production would leave the farmers vulnerable to paying high effective rates of interest in inter-linked market transactions.

The diversification into high-value or horticultural crops thus should be in addition to existing rice production. In the uplands there are vast areas that yield very little. These areas can be turned into cash crop cultivation areas. The cash from such high-value horticultural crops can be used to advance the process of accumulation (of both physical and human capital).

The adoption of horticultural and other cash crops, however, needs to be undertaken with one qualification. Given the volatility of prices of various horticultural products (e.g. coffee, cashew) it is

advisable for farmers to undertake a mixture of different horticultural crops, e.g. coffee mixed with pepper, or cashew with pineapple and turmeric, tea with *arhar*, and so on. Such combinations have a double purpose. They utilize the synergies between different parts of the eco-system, as in combining the nitrogen-fixing and shade-giving *arhar* with tea. In addition, a combination of crops provides some insurance against the volatility of prices. For instance, if coffee prices fall, it is likely that pepper could provide some stability in incomes. Cultivation of, say, coffee without cutting natural forests, i.e. "shade-grown coffee", could provide an additional premium on price, along with the promotion of organic coffee.

It is important to emphasize that diversification should not be undertaken at the expense of existing rice or other food grain production. Reducing existing food grain production in the hills would worsen the food security of these farmers and expose them to forced sales of their commercial crops at minimal prices. A better food production situation would enable these farmers to get better prices for their commercial crops.

Undertaking investment in horticultural crops, however, requires security of tenure in the land. At present, most hill land is untitled. This inhibits any possible investment in the improvement of upland cultivation. The recently-passed Forest Dwellers' (Scheduled Tribes) Rights Act (2007) needs to be implemented in order to provide the farmers the security of tenure needed to foster investments in the land.

Agricultural Labourers

One important category of the food insecure in Maharashtra is the agricultural labourers. A large proportion of them are also likely to be from the Scheduled Castes. Agricultural wages and the number of days of employment can be influenced by a number of factors – including transfer of land and resources to the landless and creation of other avenues of employment. The object of distributing land to the landless is not of creating "viable" farms, but of enabling a reduction of food insecurity among the currently landless. In the current scenario where there is a lot of migration from the countryside, there could be scope for a market-mediated land reform programme.

The National Commission on Farmers points out that land reform is the first task for agrarian renewal. The issues in the currently needed round of land reform are not the same as in the earlier rounds of the 50s and 60s. In Maharashtra, as in the rest of India, the abolition of intermediary tenures is not any more an issue. What is important is (1) security of tenancy, (2) redistribution of ceiling surplus land to the landless, and (3) land rights of women. The last two are directly important for food security. One can also include the reduction of land ceilings in order to restrict ownership to the size of a family farm.

At the production level, the case for these kinds of land reforms rests on three main propositions: that owner-operated family farms are in general more efficient in use of land and other inputs than large farms operated with supervised wage labour; that secure tenancy rights promote longer-term investment in enhancing productivity and conservation, compared to insecure rights; and that securing

women's land rights also increases agricultural productivity. Land reform then qualifies as productivity-enhancing asset redistribution, something that is an important consideration in a globalized situation (Bowles and Gintis, 1998).

Redistribution of land to the landless is both difficult to implement, and important in India, where the former untouchable castes (*dalits*) are largely landless. Studies of Bihar and UP point out that the *dalits* are concentrated among the agricultural labourers (Srivastava, 1997). Traditionally in the caste system, the *dalits* have been excluded from ownership of land. It is thus a major step in ending this age-old social exclusion for the *dalits* to gain ownership of land. This issue remains relevant for the *dalits* all over India.

As mentioned earlier, the aim of redistribution of ceiling surplus land is to enable more equitable participation in the growth process, one, which would reduce incidence of poverty of the landless.

Studies point out that ownership of even a tiny plot of land increases the bargaining power of the agricultural labourers. In Andhra Pradesh, "..the policy of allowing landless to encroach government waste land and housing sites [along with cheap credit, asset subsidies and food subsidies]..together with state funded employment creation ..significantly tightened the labour market..": (da Corta and Venkateshwarlu, 1997, 38). For UP, "The growth of non-agricultural opportunities, the more limited public works employment, as well as other factors – such as some increase in land and asset ownership among the rural poor have increased reservation wages in agriculture" (Srivastava, 1997, 47).

The transfer of property rights to the landless and land poor increased their bargaining power in the wage market. But the study from Andhra Pradesh (da Corta and Venkateshwarlu, 1997) points out that women agricultural labourers whose families got some waste land, did not share in the improved bargaining position. The responsibility of women for household maintenance and the diversion of men's incomes into liquor and other channels of personal consumption, left women with lower reservation wages than men and forced them to accept various onerous conditions of work, conditions that men refused to accept. This shows that it is not enough to increase the bargaining power of men in the name of the household. Specific attention has to be paid to increasing the bargaining power of women as agricultural labourers by allotting them individual land rights too.

The political coalition now existing does not favour an implementation of a forcible land distribution from large owners to landless and marginal owners, as was done in China, South Korea and Taiwan. Market assisted land reform, which attempts to accomplish land reallocation by "voluntary" land market transactions, has been touted as an alternative to redistributive land reform. However, "voluntary" land markets cannot function without deliberate policy interventions in support of the purchase of land by the poor households. Such an intervention can be justified not only on the equity ground but also by the generalizable proposition that small farms are more efficient than large farms.

Thus, a way of redistributing good quality land is through government purchase of designated lands and their subsequent transfer to the poor. Large landowners, anxious to migrate to urban locations with better education and more economic opportunities, may be keen to sell their lands. Without adequate political mobilization, the landless could be by-passed in yet another round of land reform. For the success of such market-mediated land reforms what is needed is to link up with organizations of the landless in the various stages of identification, take-over and redistribution.

Is it likely that there would be enough land available on a 'willing seller, willing buyer' basis for the majority of the land-aspiring poor to gain access to it? As pointed out above, with larger landowners, and particularly their children, keen to migrate to urban areas with their superior educational facilities and their new economic opportunities, there could be land available for such market-mediated transfers. There is a growth of fallow lands, not all of which may be for the above reason.

The role of food-based programmes comes in supporting those newly-acquiring land to invest labour in improving their lands. Employment schemes could be directed towards this end.

Revitalizing the Rural Economy

The Vidarbha and Marathwada regions of Maharashtra have been in the news for the large number of farmer suicides. These farmer suicides are not the result of starvation or hunger. In fact, as numerous studies have shown, suicides have taken place among farmers who are unable to repay or face their debts. In general, those committing suicide have not been from among the poor or food insecure.

But what these farmer suicides do show is that the agrarian economy of these districts is generally quite depressed. In a depressed agrarian economy, both the extent of employment and wage rates will be low, thus affecting the access of agricultural labourers (and others, such as those supplying craft production or other services to farmers) to food. Revitalizing the agrarian and thus the rural economy of these districts with high farmer suicides is necessary for improving their food security situation. Such revitalization is likely to increase employment and wages of labourers and increase the demand for locally produced products and services.

There are number of innovative programmes initiated in Maharashtra both by government and non-government or individuals which deserve attention. Ralegan Sidhi effort which has even been replicated in Hivre Bazaar of Ahmadnagar successfully is a great example of community participation in mitigating community problems which has helped in revitalizing the rural economy (see Box 7.6).

Box 7.6: Ralegan Siddhi: A Village Transformed

Ralegan Siddhi is a small village in the district of Ahmednagar, Maharashtra. It has become an example for various developmental activists throughout the country.

In 1975, this same village was caught in a web of poverty and illicit liquor trade. The per capita income was unbelievably low at Rs 271.

The transformation took place when a retired army driver Anna Hazare settled in the village. To begin with, he donated Rs 3000 to renovate a local temple. In that temple he baptised the villagers with his five commandments prohibition, family planning, a ban on open grazing, a ban on felling trees and voluntary labour. Voluntary labour was necessary to ensure minimum dependence on the government for doles. "It socialized the costs of the projects" explains Hazare. Even those who were working outside the village contributed to development by committing a month's salary every year.

Work began with the percolation tank constructed in the village. In 1975, the tank would not hold water. The embankment wall leaked. Hazare rallied people to voluntarily repair the embankment. The seven wells below it swelled with water for the first time in the living memory of the people. In summer, the people reposed their faith in Hazare and his vision.

A youth group, Tarun Mandal was formed. The group worked to ban the dowry system, caste discrimination and untouchability. Liquor distilling units were removed and prohibition imposed. Open grazing was completely banned with a new emphasis on stall-feeding. The cultivation of water-intensive crops like sugarcane was banned. Crops such as pulses, oilseeds and certain cash crops with low water requirements were grown.

All elections to local bodies began being held on the basis of consensus. "It made the community leaders complete representatives of the people" says Ganpat Rai Avti, head of the village council. A system of Nyay Panchayats (Informal courts) was also set up. Since then, no case has ever been referred to the police.

A Rs 22 lakh school building was constructed using only the resources of the village. No donations were taken. Money, if needed, was borrowed and paid back. The villagers took pride in this self-reliance. A new system of sharing labour grew out of this infusion of pride and voluntary spirit. People volunteered to work on each others' land. Landless labour also gained employment. Today the village plans to buy land for them in adjoining villages.

Today, water is abundant; agriculture flourishes in Ralegan, though at a cost, the overuse of fertilisers and pesticides. Prosperity also brings to question the ability of the affluent present generation to carry on the work after Anna. The answer lies on Anna's words. "The process of Ralegan's evolution to an ideal village will not stop. With changing times people tend to evolve new ways. In future, Ralegan might present a different model to the country.

http://www.rainwaterharvesting.org/Rural/Ralegan.htm

7.3.3 Enhancing Absorption

Increasing the nutrient intake of the poor is not the ultimate solution of food security. The capacity of body to utilize the increased intake of nutrients is very important. This depends closely on complementary measures, such as access to safe drinking water and hygienic sanitation. These two inputs would substantially reduce exposure to water-borne and gastro-intestinal diseases, such as diarrhoea and cholera, which often destroy the benefits of food consumed. We discuss below measures to improve access to clean drinking water and promote hygiene and sanitation.

7.3.3.1 Clean Drinking Water: Rural Water Supply

Accelerated Rural Water Supply Programme (ARWSP)

The main objective of the ARWSP is to provide potable drinking water by way of installing tube wells, sanitary wells and piped water supply projects in rural areas. For implementation of Rural Water Supply Schemes, the Government of India provides funds under the ARWSP.

Swajaladhara

The Rural Drinking Water Supply Programme was launched in the state on 25 December, 2002. The purpose of this scheme is to ensure community participation and to shift from a supply-driven to a demand-driven approach. The scheme envisages 10 percent of the capital cost of the project to be borne by the community along with the responsibility for the operation and maintenance of the water supply projects, and the remaining 90 percent of the capital cost to be borne by Central Government through the District Water Supply and Sanitation Mission.

Bharat Nirman: Rural Water Supply

Rural water supply is one of the six components of Bharat Nirman. During the Bharat Nirman period, 55,067 un-covered habitations and about 331 thousand 'slipped-back' habitations are to be covered, and 217 thousand quality-affected habitations are to be addressed. Under Bharat Nirman, for water quality problems, tackling arsenic and fluoride contamination has been given priority.

The norms for coverage under Rural Drinking Water supply are:

1. 40 litres per capita per day of safe drinking water for human beings.
2. One hand pump or stand post for every 250 persons.
3. The water source should exist within 1.6 kms in the plains and within 100 meters elevation in the hilly areas.

One factor in food absorption, besides the above-mentioned factors of improved water and health facilities, is that of nutritional practices. Nutritional practices here refer to those inputs (e.g. proteins or micro-nutrients) that are both available and accessible, but not consumed in desirable quantities; it also refers to behavioural practices (e.g. breast-feeding) that are not practiced as required. But as the widespread problem of under-nourishment in India shows, nutritional problems affect not just the above category of those with severe problems of food security, but also those with reasonable levels of food security, in terms of their consumption of adequate food and sufficient nutrition. The Indian experience of the last 15 years shows that despite the reduction in the incidence of poverty, there

may not be a corresponding improvement in nutritional indicators of a large section of the population.

It is interesting to note that Vietnam in the period 1992-93 to 1997-98 had a similar experience: a sharp fall in poverty without a corresponding reduction in under-nourishment. This, however, changed in the period 1997-98 to 2003-04, when there were sharp declines in both poverty and under-nourishment. This, as argued in Vinod Mishra and Ranjan Ray (2007), was brought about by a combination of policy intervention through information campaigns to promote desired changes in dietary patterns, and direct nutrient enhancing programs. All this took place in a situation of increasing literacy and educational attainment, which would be expected to generally increase nutritional awareness.

India has programmes of providing nutrition supplements, e.g., through ICDS programs of nutritional supplements. But there is clearly need for an improvement in nutritional practices even among those who can afford to acquire the right types of food. Adequate diversification of food to include more superior calories such as proteins can be promoted through information campaigns, along with providing supplements in processed foods, such as atta.

7.4 Improving Performance of Government Schemes

In Rajasthan, the Right-to-Food movement has used the Right to Information Act (RTI) for bringing into the open information about government programs. In what are called Jan Sunvais (public hearings) with the slogan "Hamara Paisa, Hamara Hisaab" (Our Money, Our Account), details of the schemes have been brought into the open. This can be useful in building public opinion and mobilizing the community against corruption in government schemes.

There is an important role for political mobilization of the poor in improving implementation of the ICDS, MDM, MGNREGS and other such schemes. Implementation of these schemes has generally been decentralized down to the panchayat level. But panchayats can be corrupt and dominated by the local power-brokers. A pilot social audit held in Bolangir districts of Orissa in November 2001 showed substantial and relatively open corruption at panchayat level (de Haan and Dubey, 2005, fn. 39, p. 2329). Studies in other States have shown that when women are in panchayats, or lead panchayats, the panchayats perform better in administering food-related interventions. In IFAD projects in Andhra Pradesh too, it was observed that women's SHGs performed better in undertaking small infrastructure projects than those managed by men and saved more money for the community than the latter.

The contribution of the PDS in promoting food security is well covered in the extensive literature on the subject. But a study by Jos Mooij (2001) points out that the supply of cheap grain for below BPL households has made running a PDS highly profitable, as cheap grain can easily be diverted into the open market or sold to APL (above poverty-line) households. More recently, the Central government is reported to have pointed out to the West Bengal government that there has been diversion of cheap

Box 7.7: Innovative Schemes for Ensuring Nutritional Security

The Department of Women and Child Development is the nodal agency for the formulation and execution of programmes directed towards the holistic development of women and children. The department also aims at implementing different social welfare schemes meant for persons with disabilities, the old, infirm and indigent persons. Within the purview of the Department, a number of innovative schemes are being executed under the larger aegis of the Integrated Child Development Services programme:

1. *Kishori Shakti Yojana:* The scheme aims at improving the nutritional, health and development status of adolescent girls (11-18 years), promote awareness of health, hygiene, nutrition and family care, link them to opportunities for learning life skills, going back to school, help them gain a better understanding of their social environment and take initiatives to become productive members of the society. The scheme is currently being executed in all the states of the country covering a total of 6118 blocks.

2. *Swayamsiddha:* This is an integrated project for the empowerment and development of women based on the formation of women into Self Help Groups (SHGs) with emphasis on converging services, developing access to micro-credit and promoting micro-enterprises.

PDS grain to the Bangladesh market. Many newspaper reports point out that even in the midst of starvation, the Food Corporation of India's godowns remain full of grains. If there is insufficient purchasing power with the poor in a district, even the supply of grain at subsidized prices is unlikely to be accessed by the poor, and there will inevitably be a tendency for this grain to flow to markets, whether within the locality or outside, where prices are higher (Jos Mooij, 2001).

The problem of diversion of foodgrains increases when there is a partial subsidy, such as with the PDS. Grain is supplied at a lower than market price, but the buyer has to have the money to buy the lower-priced grain. If the person just does not have the required money, or does not have it at the time the grain is made available, the person cannot benefit from the subsidy.

The above points to two critical points in the functioning of the PDS: First, the dual price system that it brings about, encouraging diversion of foodgrain from the lower BPL price to the higher open market price. Second, the inability of many poor households to utilize their quotas because of inadequate purchasing power.

The abolition of dual pricing would reduce the usual diversion problems, but there would still be the problem that now exists of the poor not being able to utilize the subsidy. A direct transfer would make sure that the person/household actually benefited, since it is not conditional on the beneficiary having to provide some collateral amount.

Another way of enabling the poor to acquire their public entitlement of grain would be to provide work, such as through NREGS, which allows the poor to acquire the money needed for purchase of food. A combination of a coupon system with NREGS could improve the functioning of the PDS system. Such a system would have the added benefit of increasing the monetization of the rural economy and improving the functioning of the bank and/or post office systems.

Box 7.8: Meeting the Nutritional Needs of Vulnerable Groups

Infants and Young Children

According to the National Family Health Survey 3 (NFHS-3, 2005-06), in India 40.4 per cent and 44.9 per cent of children under 3 years of age are underweight and stunted, respectively. The prevalence of underweight and stunting continually increases up to the age group of 18-23 months. This indicates that there is need for improvement in complementary feeding practices, and in the quality of complementary foods fed to infants and young children. Besides the high rates of malnutrition, the infant mortality rate is also quite high at 57 per 1,000 live births.

During the first two years of life, significant cognitive development and physical growth occurs that requires adequate nutrition as well as good care practices. Damage that may occur at this early age is often irreversible and has lifetime consequences. Therefore, it is of critical importance that children receive proper nutrition in the first few years of life.

In order to address the prevalence of widespread malnutrition and the high infant mortality rate that impede human development, the United Nations World Food Programme (WFP) is developing a low-cost 'ready-to-use supplementary food' (RUSF). The main ingredients in the ready-to-eat food will be cereal, oil, sugar, pulse, peanut paste and milk powder. In addition, the ready-to-eat food will be fortified with an array of micronutrients and will be packaged in individual hygienic serving sachets.

The food will be rigorously tested in a laboratory to ensure that it is compliant with internationally accepted standards. Next, acceptability trials will be carried out to determine how suitable the product is for the targeted beneficiaries. Finally, pilot distribution of the RUSF will be through the Integrated Child Development Services (ICDS) to infants and young children aged 6-24 months living in Nabarangapur District, Orissa. During the pilot distribution, an efficacy study will be conducted to assess the impact on the growth and micronutrient status of children receiving the RUSF compared to children receiving other foods.

The above-mentioned employment-based schemes are meant to meet the needs of shorter-term or even transient (seasonal) food insecurity. By increasing the quantities of public entitlements to food they can deal, to an extent, with immediate problems of hunger. If these foods are fortified, or supplements given as in the ICDS schemes, protein and fat deficiencies could also be temporarily tackled. But any solution to food insecurity requires an increase in the regular access to food in sufficient quantity and quality. This requires an increase in the production and earning capacity of the households and individuals too, given that there are gender-based discriminations in the distribution of food and allied health-care services within households. It is important, therefore, that food schemes be linked with development activities.

*****

8. Conclusion: Towards a Food Secure Maharashtra

8. Conclusion: Towards a Food Secure Maharashtra

The analysis in previous chapters shows that ensuring food security and improving nutritional status is a challenge for the state as a whole. Various schemes and initiatives in recent years show commitment of the government to improve the situation. This report brings out the performance of districts in each of the food security related indicators and clearly indicates the good and poor performing districts. Priority districts for food security intervention have also been identified to draw attention to the need for more inclusive growth efforts and the special interventions to bridge the divides between the regions and districts of the state.

Reducing Child Mortality and Undernutrition

In Chapter three of the report, Food Security Outcome Index based on under-five mortality and proportion of underweight children is presented. The higher incidence of under-five mortality and higher proportion of underweight children are in most of the districts of Maharashtra which indicate a poor picture as far as the Food Security Outcome is concerned. The national average for under-five mortality is 74.3 per 1,000 live births; whereas half of the districts in the state have under-five mortality figures above this national average. The national average of under-weight children is 42.5 percent. In Maharashtra, twenty six districts - out of the total thirty three districts – have proportion of underweight children above the national average. Eighteen districts have been found to be in the three insecure categories of Food Security Outcome Index (FSOI).

It is a fact that any improvement in nutritional level would increase the productivity of the individual. With regard to mothers, there is the substantial future benefit of reducing the incidence of low birth weight babies. For those with severe undernutrition, Integrated Child Development Services (ICDS) have a considerable role in improving production capabilities. But, the implementation of such programmes, including issues of reaching those with severe undernutrition depends very much on the demand from the community for these services. In the absence of such demand from the most undernourished beneficiaries, the benefits of such programmes are very likely to be captured by the better-off in the village or leak in various ways. Decentralization of the implementation of programmes has to be combined with enhanced participation of the community and awareness on issues of undernutrition, in order for the benefits to reach the target group for whom it is intended.

Another issue that might need urgent attention in terms of mitigating persisting high malnutrition is the departmental mode of implementation of programmes. All the issues related to child and women malnutrition are solely vested with the department of Women and Child Development. The issue may not be solved unless there is complete support and accountability from Department of Health and Family Welfare, Rural Development and Panchayati Raj. This calls for a synergy in action and convergence in planning and implementation for handling such issues.

To avoid micro-nutrient deficiencies, supply of fortified food should be explored as a viable option to integrate into the existing schemes. Proper utilization of such innovative attempts is needed to bring the child mortality and child malnutrition under control. It has been found that there is a long and

frequent disruption in the supply of nutrition to highly vulnerable children and mothers. There is need to strengthen transparent procedures to improve the efficiency in implementation of such programmes with community involvement to reduce mis-utilization. At the same time, improving outcomes with regard to malnutrition is very much a matter of addressing food security as such, which needs to be acted upon simultaneously.

Reducing Nutritional & Food Insecurity: Improving Availability, Access and Absorption

The concept of food security index and its three dimensions viz. availability, access and absorption is discussed in detail in chapter 3. The four indicators which form the **Food Availability Index** in this report are irrigation extent (proportion of net irrigated area to net sown area), per capita value of agricultural output, share of forest area and rural road connectivity. Agricultural production (food plus non-food crops) is not only extremely low in the forest-dominated districts but also along the coast. Even the highly irrigated districts are in the very low production category. Even intra-state, there is a large district wide variation. The western and eastern region of the state has relatively low productivity level in comparison to the central part of the state.

A look at the average rainfall and its variability over time and space, it becomes clear that the rainfall deviation from the norm is very high. Issue here is of effective conservation and utilization of water resources in these regions. The extent of irrigation is also very poor in Maharashtra. The watershed programmes have a significant role to play in this regard (Sen et al., 2007). Revitalizing the agrarian economy in the districts with rain fed agriculture is crucial to improving the income and thus food security of the poor in these areas. This requires both an increase in irrigation and in watershed development programmes like RGMWM, NWDPRA etc. National Policy for Farmers (2007) has been formulated and approved by the Government of India to improve the economic viability of farming by substantially improving the net income of farmers in addition to improving productivity, land, water and support services and providing appropriate price policy and risk management measures should also be taken help of in improving the agriculture in the state. Innovative community level efforts like that of Ralegan Sidhi and Hivre Bazaar are also improving the lives of people and can be experimented elsewhere in the state. What is important is to pay attention in existing areas of rain fed agriculture. But, bringing about changes in production systems also requires an enhancement of capabilities of both women and men.

At the same time, productivity needs to be increased in the vast common property resources (CPRs) classified as watersheds. Further, distribution of land to the landless, including women, would improve the food security and could also be an incentive to increase productivity. The access of landless and women to these CPRs would increase.

Another core area of concern is rural roads. Forested districts like Bhandara, Gondiya, Nanded, Nandurbar etc. are having very low connectivity. The improvement in the rural connectivity is a prerequisite for the improvement of food security situation in the state. MGNREGA which was evolved

and implemented through out the country and other food-for-work schemes can be channelized to improve the key areas of village road connectivity and small-scale irrigation. Village approach roads to main roads, and small irrigation schemes (e.g. check dams in valleys, or moisture retention works (on sloping lands) can both increase economic opportunities and productivity. Improved roads would also provide better access to both health and educational facilities. Improvements in rural connectivity can improve the terms of access to markets. Improved communication will also enable rural producers to produce for the wider market, whether regional, national or global, as also larger pools of knowledge. The PMGSY and Bharat Nirman programs of the Central government with the objective of making all weather roads to connect all villages of 1,000 population or over 500 persons in hilly and tribal areas should be taken up by the state aggressively. There is a need to speed-up and strengthen the process of implementation of these programmes.

In a relatively open economy, there should not be sole reliance on agriculture as the engine of rural growth. Non-agricultural production for wider markets is also an option. But, along with better communication and transport infrastructure, this also requires a more-educated workforce. A higher level of education would both enable producers to take up opportunities available through connections with the wider economy and also improve the types of jobs they can try to get on migrating. Migration is important, for as we have seen earlier, consumption in the better-off districts is probably related to income from non-farm development and to migrants' remittances. This is not to deny the importance of increasing farm productivity in the food insecure districts (so as to increase the access to food of small and marginal farmers in rain fed agriculture), but to point out that options are not limited to agricultural development.

Food Access Index has been formed with the help of six indicators – proportion of agricultural labourers, proportion of SCs and STs, average monthly per capita expenditure, rural wage rate, ratio of working age population and rural female literacy. The composite impact of these selected indicators depict that the districts in southern Maharashtra are secure whereas Nandurbar, a north-western district, falls in the extremely insecure category in terms of food access. Amravati, Yavatmal, Nanded and Gadchiroli are severely insecure.

Access measures in Maharashtra have been addressed through four flagship programmes – TPDS, Food for Work (now carried out under the MGNREGA), ICDS and Mid Day Meals Scheme. From the analysis, it is clear that the possession of ration card is lower in Maharashtra in comparison to the national average. Similarly, in terms of reach of Food for Work and Annapoorna a very small proportion of poor households get the benefit (NSS, 2004-05) and even the proportion is also lower than the national average. Though, the reach of ICDS and Mid Day Meal programme is higher than the national average, there is a need to intensify implementation of these programme with improved monitoring to make it effective in addressing issues related to access and absorption. There is an important role for mobilization and participation of the poor in improving implementation of the ICDS, MDMS, MGNREGS and other such schemes. Studies in other states have shown that when women are in

panchayats, the panchayats perform better in administering food based interventions. However, all these efforts provide safety-nets against household deficit in food. However, a long term solution to food insecurity requires an increase in the regular access, through income or self-production, to food in sufficient quantity and quality. This requires an increase in the production and earning capacity of the households and individuals too.

Given women's general responsibility for food security in rural areas of developing countries, and given the pervasive gender bias in these societies, one way of reducing gender bias is the empowerment of agency of poor. However, more sensitive approaches would be needed to address gender power relations at the household consumption level to address gender imbalance in terms of access. Consequently, food security approaches need to increasingly pay attention to the elimination of gender inequality and to women's empowerment as important preconditions.

While security of tenure would allow an increase in investments on land thus higher incomes, complementary steps need to be taken to enhance women capability in the household and community. Besides, literacy and education, there is also the issue of women's land rights. Among the food insecure, women have high labour force participation, but they do not have ownership rights over the lands on which they work. Women's ownership of land could have a double effect. It could lead to greater productivity and investment by women in land improvement by enhancing their status in the household. This along with literacy could also pave the way for women to have more of a say in the disposition of household income – away from wasteful areas (e.g., excessive alcohol consumption) and improve household level distribution of food.

Empowerment of poor women, or of the poor as a whole, is not only a matter of individual agency but also of the poor putting their stamp on economic policies. This is necessary in order to bring about the much-needed political will that is often referred to as the missing element for bringing about adequate attention to food security policies.

It is well known that the dalits and STs are concentrated among the agricultural labourers in most of the Indian states. Agricultural labourers are an important category of the food insecurity in Maharashtra. Agricultural wages and the number of days of employment are two issues which can be influenced by a number of factors – including transfer of land and resources to the landless and creation of other avenues of employment. The role of employment and food based programmes comes in for supporting those newly – acquiring land to invest labour in improving their lands. Employment schemes directed towards that end would be effective.

Food Absorption Index which is combination of safe drinking water and availability of health facilities presents two distinct regions that appear to be in critical state. In the western part of the state, Ratnagiri and Sindhudurg and in the eastern part Washim, Yavatmal and Chandrapur are extremely insecure. Nandurbar, Dhule and Jalgaon in the north and Kolhapur, Latur in the southern Maharashtra are secure in terms of food absorption index.

Access to safe drinking water in the food insecure districts is poor with high levels of fluoride content and poor quality of water. Treatment of drinking water and information about it can go a long way in improving the water quality and thereby food absorption. Given the high incidence of water-borne morbidity and mortality, improving the quality of water is likely to have a strong bearing on the food security outcomes. Besides, provision of basic health infrastructure is critical for addressing the requirements of the rural population. ARWSP programme has been a milestone in providing the safe drinking water in the state. On the other hand NRHM has been implemented in the state in order to improve the health infrastructure in the state.

However, improvement in the implementation of these schemes depends, at one level, improvement in administration and governance systems. But, more important is the role of the people who are to benefit from the schemes, whether organized through CBOs, NGOS or traditional tribal bodies. They play a very important role by insisting on the adequate implementation of these schemes and ensure that benefits are reaching the right beneficiaries. Framing adequate policies is only the first step. What is crucial is that people, women and men, assert their democratic political rights in order to ensure effective implementation of the schemes and policies Ralegan Sidhi and Hivre Bazaar case are few such examples which can be replicated elsewhere in the state.

Along with the interventions outlined above, to improve access to and absorption of food, it is also necessary to increase the information and knowledge on improved nutritional and health/ hygiene practices. Elementary measures like exclusive breast-feeding of infants till the age of six months or hand-washing after defecation, combined with knowledge of nutritionally superior foods, are needed to supplement improved access conditions.

Key Interventions in Priority Districts

An attempt has been made to see areas of interventions for priority districts of the state. Food Security Outcome Index and Food Security Index have helped in identifying priority districts which need special attention and interventions from the policy makers and state government. However, since the unit of analysis is district level and also since the district is one of the basic administrative units where the programmes are implemented, the Table 8.1 shows the districts lagging behind on specific indicators so that specific intervention can be framed in order to reduce food insecurity in the region.

As can be seen from the Table 8.1, Eastern region and Inland Eastern region of Maharashtra require major interventions in many of the indicators studied. Out of the twelve indicators analyzed and presented, five or more indicators require specific interventions in order to improve the food security situation in the eleven priority districts. As can be seen from the table that Coastal region and Inland Western region are relatively better off and require priority attention in very few indicators.

Table 8.1: Key Interventions in Priority Districts

NSS Regions	District	Irrigation Extent	Per Capita Value of Agricultural Output	Share of Forest Area	Rural Connectivity	Rural Wage Rate	Average Monthly Per Capita Expend.	Agricultural Labourers	Proportion of SCs and STs	Ratio of Working Age Group Population	Rural Female Literacy	Access to Safe Drinking Water	Access to PHC	Number of Indicators
Coastal	Thane	✓	✓	✓			✓		✓					5
Eastern	Bhandara		✓		✓	✓	✓	✓						5
	Chandrapur	✓	✓			✓		✓					✓	5
	Gadchiroli		✓	✓		✓	✓		✓		✓		✓	7
	Gondiya		✓		✓	✓	✓					✓		5
Inland Central	Nanded	✓			✓	✓	✓	✓		✓	✓			7
Inland Eastern	Nagpur	✓						✓						2
	Wardha	✓				✓		✓					✓	4
	Yavatmal	✓				✓	✓	✓					✓	5
Inland Northern	Nandurbar	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓			10
	Nashik	✓	✓			✓	✓						✓	5

The analysis of the districts in rural Maharashtra reveals that the situation of food insecurity is quite vicious in the sense that the priority districts identified appear to be performing poorly on many of the indicators. This requires a big push in order to move towards a food secure state on all parameters discussed in the atlas and not just focusing on limited aspects of deprivations.

*****

References

Agarwal, Bina (1994), *A Field of Her Own: Women and Land Rights in South Asia*: Cambridge University Press.

Black, R., et al. (2008), 'Maternal and Child Undernutrition: Global and Regional Exposures and Health Consequences', *Lancet*, Paper I, 'Maternal and Child Undernutrition', *Lancet*: 9.

Bokil, Milind, 1996, "Privatisation of Commons for the Poor: Emerging Agrarian Issues," in *Economic and Political Weekly*, August 17.

Bowles, Samuel and Herbert Gintis, 1998, *Recasting Egalitarianism: New Rules for Communities, States and* Markets, edited by Erik Olin Wright, London and New York, Verso.

Centre for Science & Environment (CSE), (2008), 'NREGA Martyrs'; in *Down to Earth* June 16-30.

Chand, Ramesh (2007), 'Demand for Foodgrains', *Economic and Political Weekly*. 42 (52), December 29 – January 4.

Chand, Ramesh and P Kumar (2006), 'Country Case Study: India', in Harmon Thomas (ed.), *Trade Reforms and Food Security*, Food and Agriculture Organization of the United Nations, Rome.

Chandrasekhar, C.P., Jayati Ghosh & Anamitra Roychowdhury (2006), 'The Demographic Dividend and Young India's Economic Future', *Economic and Political Weekly*. 41 (49), December 9–15.

Currie, Bob (2000), '*The Politics of Food Security in India: A Study of Kalahandi District'*, New Delhi, Oxford University Press.

Da Corta, Lucia and Davuluru Venkateshwarlu, 1997, "Labour Relations, Domestic Relations and the Feminisation of Agricultural Labour in Andhra Pradesh," paper presented at Workshop on Rural Labour Relations in India, LSE.

Deolalikar, Anil B (2001), *The Spatial Distribution of Public Spending on Roads in Vietnam and its Implications*, Asian Development Bank, Manila.

Eide, Asbjorn (1999), 'The right to adequate food and the right to be free from hunger', Study on the Right to Food, submitted to ECOSOC, Commission on Human Rights, 28 June, United Nations, New York, *www.unhchr.org.*

FAO (1996), *Report of the World Food Summit,* Rome, *www.fao.org.*

Fan, S., P. Hazell and S. Thorat (1999), *Linkages between Government Spending, Growth and Poverty in Rural India*, International Food Policy Research Institute, Washington DC.

Gaiha, Raghav (2003), 'Does the Right to Food Matter?' in *Economic and Political Weekly,* Oct 4–10.

Government of India (2007a), *The Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006*, The Gazette of India, January 2.

Government of Maharashtra, 2002, *Maharashtra Human Development Report*, Mumbai.

Gujja, Biksham and Hajara Shaik (2005), 'A Decade for Action: Water for Life', *Economic and Political Weekly*. 40 (12), March 19.

Gupta, Monika Das (2005), 'Public Health in India: Dangerous Neglect', *Economic and Political Weekly*. 40 (49), December 3.

Hanumantha Rao, C. H., 1994, "Reforming Indian Agriculture in the New Context," in *Economic and Political Weekly,* June 12.

IPCC (2007), *Climate Change Impacts, Adaptation and Vulnerability*, Summary for Policymakers, Intergovernmental Panel on Climatic Change.

Jacoby, H. (2000), 'Access to Rural Markets and the Benefits of Rural Roads,' *The Economic Journal*. No. 110: 713–37.

Jha, Vikas (2005), 'Migration of Orissa's Tribal Women: A New Story of Exploitation', *Economic and Political Weekly*. 40 (15), April 9:1495–1496.

Jodha, N. S. 2000, 'Waste Lands Management in India,' in *Economic and Political Weekly*, Feb. 5 – 11.

Krishnan, Rekha, Suruchi Bhadwal, Akram Javed, Shaleen Singhal, S Sreekesh. 2003. 'Water Stress in Indian Villages', *Economic and Political Weekly*. 38 (37), September 13.

Leipziger D., M. Fay, Q. Wodon and T. Yepes (2003), *Achieving the Millennium Development Goals: The Role of Infrastructure*', World Bank Policy Research Working Paper 3163, World Bank, Washington DC.

Kelkar, Govind, 1992, *Women, Peasant Organizations and Land Rights*, Gender Studies, Occasional Paper 3, Gender and Development Studies Unit, Asian Institute of Technology, Bangkok.

Mishra, Vinod and Ranjan Ray (2007), '*Dietary Diversity, Food Security and Undernourishment: The Vietnamese Evidence*', Ranjan.Ray@utas.edu.au

Mooij, Jos (2001), 'Food and Power in Bihar and Jharkhand: PDS and Its Functioning,' in *Economic and Political Weekly*. August 25.

MSSRF and WFP (2001), *Food Insecurity Atlas of Rural India*. M.S. Swaminathan Research Foundation and World Food Programme.

NCEUS (2007), *Report on Conditions of Work and Promotion of Livelihoods in the Unorganized Sector*, National Commission for Enterprises in the Unorganized Sector, August, New Delhi.

NFHS (2007), '*National Family Health Survey III*', International Institute for Population Studies, Mumbai.

Nhalpo, Charlotte McClain (2004), *Implementing A Human Rights Approach to Food Security*, IFPRI, www.ifpri.org/pubs/ib/ib29/pdf

Office of the Registrar General (2006), *Population Projections for India and States 2001-2026*, Report of Technical Group on Population Projections Constituted by the National Commission on Population, Government of India, New Delhi.

Planning Commission (2007), *Poverty Estimates for 2004–05*, Press Information Bureau, Govt. of India, March 2007.

—— (2007a), *Towards Inclusive Growth: Approach Paper for the 11th Five-Year Plan.*

Rath, Sharadini (2001), 'Poverty by Price Indices' in *Economic & Political Weekly,* October 4, 2003.

Save the Children (2006), *State of World's Mothers 2006: Saving the Lives of Mothers and Newborns*, Save the Children.

—— (2008), *Saving Children's Lives: Why Equity Matters*, Save the Children, London.

Sen, Amartya (1981), *Poverty and Famines: An Essay on Entitlement and Deprivation*, Oxford: Clarendon Press.

Shah, Amita, 1997, Food Security and Access to Natural Resources," in *Economic and Political Weekly*, June 28.

Sharma, R. K. and Babu Jacob, 1997, "Livestock Growth, Employment and Rural Poverty in India," in G. K. Chadha and Alakh Sharma, editors, *Growth, Employment and Poverty: Change and Continuity in India*, Indian Society of Agricultural Economics, Vikas Publishing House, New Delhi.

Srivastava, Nisha (2003), 'The Paradox of Food Insecurity in a Food Surplus State: The Case of Uttar Pradesh,' in S. Mahendra Dev, K.P. Kannan and Nira Ramachandran, editors, *Towards A Food Secure India: Issues and Politics*, Institute for Human Development, New Delhi, and Centre for Economic and Social Studies, Hyderabad.

Srivastava, N. (2006), 'Innovative Interventions: The Food for Work Project in the Chhattisgarh Tribal Development Programme in Srivastava N. and Sharma (eds), *Protecting the Vulnerable Poor in India: The Role of Food Safety Nets* World Food Programme, New Delhi.

Srivastava, Ravi, 1997, "Rural Labour in Uttar Pradesh: Emerging Features of Subsistence, Contradiction and Resistance," paper read at workshop in Rural Labour Relations in India, LSE, London.

Srivastava, Ravi and S.K. Sasikumar (2003), *An Overview of Migration in India, its Impacts and Key Issues*, Refugee and Migratory Movements Research Unit, University of Dhaka and Department of International Development.

UN, *Report of the World Food Conference*, Rome 5–16 November 1975, New York: UN.

UNICEF (2005), *UNICEF Joint Health and Nutrition Strategy for 2006–2015 (E/ICEF/2006/8)*, UN Economic and Social Council, New York, November 15: 3–4.

—— (2006), *Countdown to 2015, Tracking Progress in Child Survival: The 2005 Report*, Health Section, United Nations Children's Fund, New York.

—— (2007a), *The State of the World's Children 2007: Women and children - The Double Dividend of Gender Equality*, United Nations Children's Fund, New York, December: 137, 141.

—— (2007b), *The State of the World's Children 2008: Child Survival*, United Nations Children's Fund, New York, December.

—— (2007c), *Progress for Children: A World Fit for Children*, Statistical Review.

UNICEF & WHO (2006), *Pneumonia: The forgotten killer of Children*, United Nations Children's Fund and World Health Organization, New York and Geneva: 5.

WHO (2007), *Health Status: Mortality*, World Health Statistics 2006, World Health Organization, Geneva, pp. 29-31.

Appendix I: The Right to Food

Along with the change in understanding of the meaning of food security, there has been much discussion on whether there is a right to food. The kind of economic growth that the world has been undergoing has been seen to not automatically 'trickle down' in benefits to all. Even a reasonably high rate of growth, like India's 6per cent or so over the period 1995-2004, has been seen to not bring about a commensurate reduction in the proportion of those who are undernourished. The existence or acceptance of a right to food would make the exertion of pressure to adopt and implement a policy that secures this right more likely. But is there a right to food?

The right to food or 'freedom from hunger' figures in the Universal Declaration of Human Rights (1948). Subsequently the UN General Assembly adopted two covenants in 1966, one on Civil and Political Rights and the other on Economic, Social and Cultural Rights. Besides these covenants, the Convention on the Rights of the Child and the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW) both considerably strengthened the place of the right to food and adequate nutrition in international law on human rights.

A two-fold distinction is often made between the civil and political rights, on the one hand, and economic, social and cultural rights, on the other (Eide 1999). The first set is said to be 'absolute', and 'immediate', while the second set is considered something relative and to be realized gradually, over time. In a sense this distinction coincides with the Indian constitution's distinction between its 'core' provisions, which are to be realized immediately, and its 'Directive Principles of State Policy', which are programmatic and to be realized over time.

It can well be argued that the civil and political rights are also something that can only be realized over time. Merely putting them into the statute books does not result in their being realized. On the other side, if civil and political rights are held to be the foundation of democracy, one can as well argue that economic and social rights are equally important to democracy. Without economic rights, and not just the right to property, political democracy itself would be a mere shell. The realization of political and economic rights is inter-twined and one set does not have any *a priori* precedence over the other.

A related distinction is between rights that are respected through non-interference and those that require resources to be realized. The first is like the freedom of religion, or of association, while the right to food would require resources to be realized. Jean Zigler, the UN Special Rapporteur on the Right to Food, questioned the whole distinction between those freedoms that require resources to be realized and those freedoms that do not. The whole machinery of the state, of administration, police, courts, etc. all need to set up, and involve costs, to enable citizens to realize the freedom to religion, or freedom of association, and associated rights. '*Even implementing civil and political rights does in fact imply resources. The cost of setting up and training the police force, military and judiciary to implement international human rights law is not insignificant.*' (Jean Zigler, 2002, quoted in FAO, WFS-fyl, Focus on Issues, What is the right to food? *www.fao.org*)

Thus, rights require state action with regard to the obligations to respect, protect and fulfil them.(Shue, 1980 in Gaiha 2003), which require setting up of administrative, police, and judicial structures to enable rights to be realized. Consequently all rights have a cost in their being realized. And the costs of the right to food may not be as much as they seem, since it is only in certain circumstances that it involves state provision of food (Gaiha, 2003, 4270).

What the acceptance of the right to food does is to focus attention on the necessity of economic and social policy paying attention to the poorest and most marginal. It also takes the debate on rights inside the 'private sphere' to raise the question of women's rights in assuring food to themselves and their children and families. 'The "right to adequate food" may be as much a question of the full realization of the rights of women as of ensuring a bundle of nutrients handed over through food supplement schemes.' (Asbjorn Eide, 1999, 'The right to adequate food and to be free from hunger,' Study on the Right to Food submitted to the ECOSOC, Commission on Human Rights, 28 June, United Nations, New York, (*www.unhchr.ch*)

Right to Food in India

Earlier, we looked at the status of the right to food and its embodiment in various international covenants. Food policies, however, are critically formulated and implemented at the level of the national state. It is, perhaps, only in the case of 'failed states' that the international covenants can themselves be the basis for action by international agencies. For the most part, and certainly in India, it is through the national state that actions on the right to food are carried out. Of course, this does not mean that some actions cannot be carried out at the international level, as, for instance, by groups representing women or indigenous peoples taking their case for redressal of grievances to their respective international forums in the manner that trade unions also take their case to the ILO.

The establishment of a 'right to food' in India was substantially carried forward by the April 2001 petition of the People's Union for Civil Liberties (PUCL), Rajasthan, (PUCL vs Union of India and Others, Writ Petition (Civil) 196 of 2001) and the orders of the Supreme Court of India in response to this and subsequent petitions. In the context of the then-prevailing drought in Rajasthan, the argument of the PUCL[1] was simple – that Article 21 of the Constitution of India guarantees the 'right to life' and imposes on the state the duty to protect this right to life. In elaborating the right to life, the Supreme Court in past decisions had held that this right also includes the right to live with dignity and all that goes to make this up, including the right to food.

The petition argued that in the context of the drought in Rajasthan, the actions or inactions of the Governments of India and of the State of Rajasthan, constituted a violation of this right to food and, thus, of the right to life. Specifically, the violation of the right to food was seen in two aspects. First, was the failure of the Public Distribution System (PDS), in terms of the exclusion of various Below

1. This account of the PUCL's petition and related matters is based on *Legal Action for the Right to Food: Supreme Court Orders and Related Documents*, January 2004, downloaded from *www.righttofood.org* now replaced by the website *www.righttofoodindia.org.*

Poverty Line (BPL) households from its scope. Second, was the inadequacy of the quantities delivered through the PDS as the monthly quota could not meet the household's nutritional standards set by the Indian Council of Medical Research (ICMR).

The PUCL petition also pointed to the inadequacy of government relief works in the Rajasthan drought condition. Thus, it linked the right to access relief works in a drought condition as part of the meaning of the right to food. As the Supreme Court pointed out in a later order, while agreeing with the High-Level Committee on Long-Term Grain Policy (Abhijit Sen Committee), employment generation should be distinct from food delivery: 'This should not, however, undermine the importance of employment and income generation in eliminating hunger and malnutrition' (Supreme Court Order of 2 May 2003).

The different orders of the Supreme Court:

- Established a Constitutional basis for the right to food in terms of the right to life;
- Drew attention to the serious plight of the aged, destitute, etc;
- Stated that where the hungry are not able to buy grain, even at the subsidized price, the relevant governments should consider giving them the grain free;
- Pointed out that 'Plenty of food is available, but distribution of the same amongst the very poor and destitute is scarce and non-existent leading to mal-nourishment, starvation and other related problems';
- Identified the various schemes to operationalize the right to food;
- Changed the status of those who received food or income through these schemes from 'beneficiaries' to 'rights-holders';
- Made the Government of India and the State Governments responsible for securing the right to food through these schemes;
- Placed responsibility on specified government officials (Chief Secretary of the State Governments, District Magistrates) as being answerable for the implementation of the schemes that concretize the right to food, and thus being accountable for failures, like starvation deaths; and
- Established Food Commissioners who would report on and monitor implementation of schemes constituting the right to food.

At the level of rights this is a reasonably comprehensive scheme with rights, ways of achieving them, responsibilities for achieving them, all fairly well specified. Given the fact that there is a clear perpetuation of both endemic starvation and frequent bouts of acute starvation, it is necessary to see how to link food security measures with development. Rights are critical in establishing the

obligation of the state to provide a means of realizing those rights. But the measures that realize the right to food also need to be connected and contribute to development objectives, such as to improve productive capacities of small and marginal farmers, increase employment opportunities for agricultural labour, and empower women so as to increase the access to food through their normal economic activities. Measures relating to the above have all been discussed in various sections of this report. They need to be drawn together into a comprehensive package.

Appendix II: Food Security Index (FSI) – A Methodological Note

Appendix II: Food Security Index (FSI) – A Methodological Note

At the outset we must state that the Food Security Index is calculated for rural areas only. All variables constructed in this section are for rural areas, unless otherwise specified.

Here we have attempted to construct a Food Security Index (FSI) at the sub-state level, that is, the district level. The district having a higher index value is considered as relatively more food secure as compared to a district with a lower index value.

Broadly, we have adopted Max-Min (range equalization method, REM) approach, adopted by UNDP (HDR 2005); and Principal Component Analysis (PCA). One of the objectives of the district FSI is to show the district's position in various dimensions of food security.

The FSI is a composite index covering three dimensions, i.e., Availability factors, Access factors, and Absorption factors. Besides these three groups of factors, an additional component i.e. public entitlement has been used to explain how this influences food security. But the public entitlement factor is not included in the indices of food security. The public entitlement policy is based on various parameters which are supposed to be directly linked with food insecurity; the lower the level of food security, the greater should be public intervention. In such a scenario, the direction of public interventions should run counter to the FSI, though it need not be so.

For each of the dimensions, as discussed earlier, some relevant variables have been chosen.

Table A 2.1: Choice of Indicators, Sources, Reference Year and Calculating Procedure in Maharashtra

Name of Variable and Description	Sources	Ref. Year
(a) Availability		
1. Proportion of net irrigated area to net sown area	Agricultural Statistical Information, Maharashtra State, 2002 (Part II) Page 3 & 25	1996-97
2. Per capita value of agricultural output In order to take into account the cyclical nature of agricultural production the variable uses an average of three to five years depending on the availability of data. The value of each food and non-food item is derived by multiplying the amount of production with its price obtained from all-India prices of these items at constant 1993-94 prices. Adding the value of each and every food and non-food item gives the overall value of agricultural output for a year. The per capita value of agricultural output is calculated by dividing the average value of agricultural output by total population in the midpoint year.	Department of Agriculture, Government of Maharashtra Downloaded from http://agri.mah.nic.in/agri/stat/aspstat/mainframeagristat.htm	2002-03 to 2004-05
3. Percentage of inhabited villages having access to paved roads. This is calculated as a share of total number of villages in the district	Census of India, 2001	2001

Name of Variable and Description	Sources	Ref. Year
4. Percentage of forest area to total geographical area	Directorate of Agriculture, Government of Maharashtra.	2000
(b) Access		
1. Percentage of agricultural labour to total workers. Agricultural labour comprises both main and marginal workers*	Census of India, 2001	2001
2. Proportion of ST and SC population to total population*	Census of India, 2001	2001
3. Dependency ratio This is calculated as rural population in the age group (15-59) divided by the sum of (0-14) child population and 59+ population.	Census of India, 2001	2001
4. Per capita monthly consumption expenditure (inequality adjusted) The formula for inequality adjusted monthly per capita consumption expenditure (MPCE) is: MPCE*(1-Gini).	61st NSS round	2004-05
5. Rural casual wage rate This is calculated as average daily wage rate for the age group 15-59	61st NSS round	2004-05
6. Women's literacy rate (7+) Total female literate as a proportion of total female population for the 7 years and above.	Census of India, 2001	2001
(c) Utilization		
1. Percentage of households having access to safe drinking water. Here rural households with access to three sources of drinking water, such as tube well, tap and hand pump have been considered.	Census of India, 2001	2001
2. Percentage of inhabited villages having access to a PHC (PHC facility within the village or within 5 kms from the village)	Census of India, 2001	2001
(d) Public Entitlement		
1. Percentage of midday meal beneficiaries out of total children The data for MDM is for rural and urban areas combined. To find out the value of this variable we have divided the total MDM beneficiaries by the projected child population (Rural+Urban) in the age group (6-11) and multiplied the ratio by 100	Department of Rural Development, Government of Maharashtra	September, 2006
2. Percentage of ICDS beneficiaries to total project population Here we have taken only the SNP (supplementary nutrition programme) beneficiaries. To find out the value of this variable we have divided the SNP beneficiaries (pregnant and lactating women and children (0-6) age group) by total population covered by the project.	Department of Women and Child Development, Government of Maharashtra	May 2007

**The direction of these variables have been reversed to have a positive association with food security.*

Max-Min Approach

Using the Max-Min approach an index has been constructed for each variable. This is calculated by applying the following general Range Equalization Method (REM) formula adopted by the UNDP:

$$\text{Variable Index} = \frac{(Xi - \min X)}{(\text{Max } X - \text{Min } X)}$$

where Xi- 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, desirable norms have been adopted for each indicator. In some cases, the scaling of indicators is self-selecting, and for some others there is an element of value judgment.

Construction of Food Security Index

Different indicators included in the three components of the FSI have been scaled and normalized (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 to1. For three selected variables, viz., percentage of agricultural labour to all labour and proportion of ST and SC population and percentage of forest area to total geographical area, we have used the reverse figure (per cent of non-agricultural labour to total workers; per cent of non-ST & SC to total population; and per cent of non-forest area to total area). Likewise, the variable dependency ratio has also been reversed.

After calculating the index of each variable, we have averaged them to give each of the three dimensions of food security. The composite Food Security Index is again derived by averaging all the selected indicators.

Principal Component Analysis (PCA)

The PCA is a data reduction technique. Sometimes there is a high correlation between variables. In such cases, it is useful to transform the original data set into a new set of uncorrelated variables called principal components. It is quite likely that the first few components account for most of the variability in the original dataset. The PCA can be applied either to the original values of variables or to the normalized values of the variables. In general, normalization can be done by three methods, i.e., by deviation of the variables from their respective means (i.e. $X - \bar{X}$); by dividing the actual values by their respective means (i.e. $X / \bar{X}$,) and by the deviation of the value of a variable from the mean which is then divided by standard deviation {i.e., $(X - \bar{X})/\sigma$}. We have applied the second method.

The basic objective of using PCA is to find the factor loading of each and every variable. Factor loading gives us the amount of total variation explained by a particular variable.

We have used PCA in the Food Security Index for those states where the correlation between indices derived through the RE method and PCA method is highly correlated.

Food Security Outcome (FSO)

To cross check the validity of the Food Security Index for the three AAA (Availability, Access and Absorption) components, we have used the Food Security Outcome (FSO) index. The nutritional status of an individual can be considered as the outcome of food security. Though intake of food is not the only factor that affects nutritional status, it is definitely the prime one. The outcome index calculated here is based on two child-related variables: child mortality rate (CMR) and child malnutrition (weight for age -2SD). Child malnutrition - 2SD includes children who are below -3SD from the International Reference Population median. The district-wise figure relating to the above two variables are taken from the Reproductive and Child Health (RCH) 2002 Survey.

The food security outcome (FSO) against which the input variables are considered here as explanatory indicators should ideally be a composition of morbidity, mortality and under-nutrition among the entire rural population, which includes adults. However, due to inadequacy of data on adults, especially at the district-level, we have resorted to using the child-related variables to construct the FSO. In order to validate the use of this, we have undertaken a simple correlation exercise at the state level between the Body Mass Index (BMI) for adults and the FSO.

The State-level Body Mass Index for men and women has been used from NFHS III. The NFHS calculates BMI as weight in kilograms divided by the square of height in meters and the resulting value is again divided by the number of men/women in the 15-49 age group. Here we have taken the number of men and women with BMI below 17.0 which tells us the number of men /women moderately and severely thin. The composite adult BMI has been calculated by aggregation of BMI for men and women using the population share of men and women in the sample as weights.

We have calculated the state-level Food Security Outcome index (for 29 states) from DLHS and NFHS child-related variables (the same two variables taken for the district-level FSO). We have adopted the RE method for finding out the state-level FSO. The correlation among the DLHS and NFHS child-related indicators as well as NFHS-based BMI adult indicators shows a very high correlation across 29 states, thereby justifying the use of the child FSO as the outcome measure. However, it can be argued that inter-district variations within different states can be quite dissimilar.

Grouping of Districts

For each variable, component and index, districts have been divided into five classes: Secure to Moderately Secure, Moderately Insecure, Severely Insecure and Extremely Insecure. The method used for making class intervals is the 'equal intervals' method, i.e. the difference between all upper and lower class intervals for an indicator is the same. This method takes into account the range of the indicator's values and divides the range into five equal classes. The number of districts in different classes can be different.

Appendix III: Index Value, Normative Value and Key Food Security Intervention

Appendix III: Index Value, Normative Value and Key Food Security Intervention

Table A3.1:
Index Values and Normative Value of Availability Variables

District	% Non-forest Area to Geographical Areas	% Net Irrigated Area to Net Sown Area	Per Capita Value of Agricultural Output	Paved Road
Ahmadnagar	0.893	0.265	0.138	0.803
Akola	0.939	0.033	0.452	0.803
Amravati	0.718	0.086	0.355	0.882
Aurangabad	0.922	0.219	0.287	0.769
Bhandara	0.680	0.660	0.185	0.348
Bid	0.976	0.253	0.338	0.807
Buldana	0.880	0.058	0.400	0.712
Chandrapur	0.604	0.234	0.290	0.894
Dhule	0.677	0.125	0.261	0.707
Gadchiroli	0.180	0.328	0.100	0.638
Gondiya *	0.680	0.660	0.129	0.290
Hingoli *	0.933	0.093	0.569	0.741
Jalgaon	0.850	0.181	0.415	0.892
Jalna	0.993	0.181	0.511	0.830
Kolhapur	0.789	0.264	0.460	0.676
Latur	0.997	0.076	0.341	0.763
Nagpur	0.793	0.209	0.348	0.867
Nanded	0.908	0.081	0.348	0.542
Nandurbar *	0.471	0.125	0.182	0.517
Nashik	0.778	0.226	0.147	0.868
Osmanabad	0.994	0.176	0.308	0.757
Parbhani	0.989	0.093	0.649	0.993
Pune	0.883	0.253	0.192	0.842
Raigarh	0.757	0.061	0.134	0.599
Ratnagiri	0.992	0.012	0.085	0.875
Sangli	0.942	0.220	0.324	0.907
Satara	0.850	0.311	0.262	0.793
Sindhudurg	0.927	0.265	0.229	0.725
Solapur	0.974	0.218	0.158	0.985
Thane	0.481	0.046	0.085	0.719
Wardha	***0.890***	***0.058***	***0.599***	***0.727***
Washim *	***0.924***	***0.033***	***0.566***	***0.802***
Yavatmal	***0.799***	***0.060***	***0.394***	***0.708***
Lowest range	***10.00***	***0.00***	***200.00***	***30.00***
Highest Range	***100.00***	***100.00***	***5000.00***	***100.00***

Table A3.2:
Index Values and Normative Value of Access Variables

District	% other than agricultural labourers to all labourers	% of non (SC+ST) population to total	Ratio of Working Age Population	Monthly Per Capita Consumption Expenditure	Rural Casual Wage Rate	Rural
Ahmadnagar	0.595	0.794	0.341	0.504	0.333	0.682
Akola	0.115	0.800	0.356	0.406	0.198	0.788
Amravati	0.103	0.625	0.369	0.298	0.206	0.815
Aurangabad	0.537	0.840	0.248	0.258	0.262	0.554
Bhandara	0.296	0.735	0.475	0.203	0.206	0.736
Bid	0.546	0.857	0.229	0.239	0.264	0.547
Buldana	0.286	0.828	0.316	0.370	0.196	0.680
Chandrapur	0.306	0.649	0.438	0.409	0.272	0.614
Dhule	0.277	0.607	0.335	0.327	0.237	0.609
Gadchiroli	0.443	0.488	0.407	0.203	0.253	0.481
Gondiya *	0.440	0.688	0.452	0.301	0.255	0.741
Hingoli *	0.421	0.797	0.233	0.352	0.237	0.510
Jalgaon	0.213	0.771	0.353	0.409	0.262	0.661
Jalna	0.467	0.862	0.228	0.306	0.243	0.462
Kolhapur	0.699	0.860	0.470	0.515	0.328	0.676
Latur	0.385	0.770	0.250	0.248	0.262	0.612
Nagpur	0.332	0.684	0.429	0.400	0.341	0.754
Nanded	0.323	0.712	0.240	0.282	0.281	0.533
Nandurbar *	0.258	0.227	0.286	0.234	0.243	0.400
Nashik	0.526	0.575	0.348	0.260	0.213	0.611
Osmanabad	0.403	0.812	0.252	0.510	0.309	0.592
Parbhani	0.369	0.870	0.212	0.352	0.205	0.473
Pune	0.665	0.852	0.401	0.584	0.358	0.676
Raigarh	0.643	0.835	0.427	0.430	0.487	0.715
Ratnagiri	0.794	0.974	0.361	0.433	0.387	0.714
Sangli	0.625	0.874	0.393	0.435	0.337	0.713
Satara	0.666	0.908	0.396	0.568	0.395	0.753
Sindhudurg	0.703	0.949	0.436	0.537	0.280	0.798
Solapur	0.482	0.827	0.334	0.501	0.316	0.615
Thane	0.611	0.510	0.435	0.350	0.456	0.568
Wardha	0.279	0.731	0.434	0.400	0.269	0.781
Washim *	***0.204***	***0.752***	***0.307***	***0.406***	***0.219***	***0.634***
Yavatmal	***0.210***	***0.679***	***0.353***	***0.308***	***0.205***	***0.646***
Lowest range	***30.00***	***0.00***	***0.60***	***150.00***	***15.00***	***10.00***
Highest Range	***100.00***	***100.00***	***2.50***	***800.00***	***100.00***	***85.00***

Table A3.3:
Index Values and Normative Value of Absorption Variables

District	% HH Access to Safe Drinking Water	PHCs
Ahmadnagar	0.483	0.446
Akola	0.733	0.272
Amravati	0.816	0.360
Aurangabad	0.677	0.322
Bhandara	0.580	0.710
Bid	0.747	0.384
Buldana	0.622	0.457
Chandrapur	0.532	0.336
Dhule	0.857	0.483
Gadchiroli	0.520	0.381
Gondiya *	0.437	0.801
Hingoli *	0.683	0.241
Jalgaon	0.911	0.485
Jalna	0.676	0.339
Kolhapur	0.826	0.570
Latur	0.829	0.506
Nagpur	0.714	0.528
Nanded	0.694	0.523
Nandurbar *	0.797	0.680
Nashik	0.489	0.414
Osmanabad	0.859	0.461
Parbhani	0.777	0.304
Pune	0.605	0.469
Raigarh	0.559	0.504
Ratnagiri	0.362	0.425
Sangli	0.738	0.533
Satara	0.794	0.325
Sindhudurg	0.167	0.570
Solapur	0.657	0.324
Thane	0.471	0.646
Wardha	0.602	0.392
Washim *	0.477	0.378
Yavatmal	0.527	0.334
Lowest range	***10.00***	***0.00***
Highest Range	***100.00***	***70.00***

Table A3.4:
Key Food Security Interventions in Districts of Maharashtra

Region	District	Irrigation Extent	Per Capita Value of Agricultural Output	Share of Forest	Rural Connectivity	Rural Wage Rate	Average Monthly Per Capita Expenditure	Agricultural Labourers	Proportion of SCs and STs	Ratio of Working Age Group Population	Rural Female Literacy	Access to Safe Drinking Water	Access to PHC	No. of Indicators
Eastern	Raigarh	√	√											2
	Ratnagiri	√	√									√	√	4
	Sindhudurg	√	√			√						√		4
	Thane	√	√	√			√		√					5
	Bhandara		√		√	√	√	√						5
	Chandrapur	√	√			√		√					√	5
	Gadchiroli		√	√		√	√		√		√		√	7
	Gondiya		√		√	√	√					√		5
Inland Central	Aurangabad	√	√			√	√			√	√		√	7
	Bid	√				√	√			√	√		√	6
	Hingoli	√				√	√			√	√		√	6
	Jalna	√				√	√			√	√		√	6
	Latur	√				√	√			√				4
	Nanded	√			√	√	√	√		√	√			7
	Osmanabad	√	√			√				√			√	5
	Parbhani	√				√	√	√		√	√		√	7
Inland Eastern	Akola	√				√		√					√	4
	amravati	√				√	√	√					√	5
	Buldana	√				√		√		√			√	5
	Nagpur	√						√						2
	Wardha	√				√		√					√	4
	Washim	√				√		√		√			√	5
	Yavatmal	√				√	√	√					√	5
Inland Northern	Dhule	√	√			√	√	√						5
	Jalgaon	√				√		√						3
	Nandurbar	√	√	√	√	√	√	√	√	√	√			10
	Nashik	√	√			√	√						√	5
Inland Western	Ahmadnagar	√	√										√	3
	Kolhapur	√												1
	Pune	√	√											2
	Sangli	√												1
	Satara		√										√	2
	Solapur	√	√										√	3

The **Food Security Atlas of Rural Maharashtra** is one of a series of eight Atlases produced by the Institute for Human Development (IHD) and the UN World Food Programme (WFP). The other states covered in this series are: Jharkhand, Chhattisgarh, Madhya Pradesh, Orissa, Rajasthan, Bihar and Uttar Pradesh. The Atlases carry out a district-level analysis of food security for each of these states.

The purpose of the Atlas is to identify regions and districts within the state that require priority attention in order to improve their food security status. This is followed by an identification of the characteristics that differentiate the better-off from the worse-off districts. These characteristics of food insecure regions and districts are used to put forward a set of recommended interventions that could be expected to improve food security.

It is hoped that the Atlas will stimulate further analysis, action and advocacy for reducing the incidence of hunger.

Institute for Human Development (IHD)
NIDM Building, IIPA Campus
New Delhi 110002
www.ihdindia.org

The UN World Food Programme (WFP)
2 Poorvi Marg, Vasant Vihar
New Delhi 110057
www.wfp.org