



॥वसुधैव कुटुम्बकम्॥

**SYMBIOSIS**  
SCHOOL OF ECONOMICS



**NABARD**  
NATIONAL BANK FOR  
AGRICULTURE AND RURAL DEVELOPMENT



Pune  
October, 2018





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# The Rural Development Infrastructure Index Including Physical, Social and Institutional Dimensions

Final Report Submitted to  
Department of Economics Analysis and Research (DEAR),  
National Bank for Agriculture and Rural Development (NABARD)

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October 2018

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## Preface

Maharashtra, the second most populated state in India, is known for its highest contribution to the GDP of the country, but has at the same time been troubled by the high degree of regional disparities. This has been identified by the Fact Finding Committee Report (1984), the Indicators and Backlog Committee Report (1997) and more recently the Report of the High Level Committee on Balanced Regional Development Issues in Maharashtra (2013). Given this backdrop, in January 2018, National Bank for Agriculture and Rural Development (NABARD) granted the project to Symbiosis School of Economics (SSE), department of the Symbiosis International (Deemed University), Pune, to develop and create the Rural Development Infrastructure Index (RDII) for the districts of Maharashtra.

The study has developed and created a Composite Infrastructural Index, comprising the Physical Infrastructure Index (PII), the Social Infrastructure Index (SII) and the Institutional Infrastructure Index (III), for the 33 districts of Maharashtra. The study has helped in identifying the laggard or the aspirational districts, as termed by Niti Aayog (March 2018), with respect to each of the indices as well as the composite index.

The study also throws light on the relative performances of the eight agriculture divisions of the State and identifies the aspirational district in each of the regions. Further, district-wise report card has been prepared highlighting the performances of each district on the 28 parameters identified – 12 for PII, and 8 each for SII and III. While we have proposed that certain indicators require global benchmarking, other indicators will be required to inch closer to those, ranked as the best performing districts in the State or the country. This will help the districts to accurately identify the most critical issues that need to be addressed with astute grass-root strategizing and planning.

It is necessary to recognize that the study had to depend on a pool of secondary data available uniformly across the districts. However, the ground reality maybe better as both India and Maharashtra are fervently progressing with high degree of interventions through various central and state schemes for better development outcomes.

I would like to place on record the noteworthy contributions of each member of the team who has contributed tirelessly, giving enormous amount of their time and efforts towards completion of the study. I am sure this study will be a beginning for many more district and block level analysis and evaluation, with the prime objective of ensuring better delivery of infrastructure and service at the ground level.

**Prof. Jyoti Chandiramani**

Director, Symbiosis School of Economics  
Dean, Faculty of Humanities and Social Sciences  
Symbiosis International (Deemed University)



## Acknowledgement

The study “Rural Development Infrastructure Index Including Physical, Social and Institutional Dimensions” has been carried out by Symbiosis School of Economics (SSE) with a view to assess the status of rural infrastructure for 33 districts of Maharashtra. SSE would like to express gratitude to Department of Economic Analysis and Research (DEAR) - National Bank for Agriculture and Rural Development (NABARD) for financial support of this study. We would like to express our special thanks to Dr. U.S. Saha, Chief General Manager (DEAR), and Dr. R.N. Kulkarni, Chief General Manager (NABARD, Pune) for providing us with the opportunity to undertake the study and giving us timely and invaluable suggestions throughout the course of the project. The support, cooperation, and valuable inputs received from Shri K.L. Prabhakar, Deputy General Manager (DEAR), Dr. Alaka Padhi (DGM, NABARD, Pune), Dr. Sohan Premi (Assistant Manager, DEAR), and other officials from NABARD are gracefully acknowledged.

The research team would like to place on record sincere gratitude to the officials of various departments: Department of Soil and Water Conservation, Office of Commissioner of Agriculture, Office of Commissioner for Cooperation and Registrar, Cooperative Societies, Government of Maharashtra. Sincere thanks to the office of State Level Bankers' Committee (Maharashtra) for providing us the data related to banking sector. We are indeed grateful to the Gram Sevaks, Revenue Officers and Agricultural Assistants of Anandgaon, Choramba, Ambheri, Vadi and Bholi villages for all the help extended at village-level. We also thank the officials of Primary Health Centres, Schools, and Regulated Markets of the sample villages, undertaken for the case study. The study team would like to thank the District Development Managers of NABARD from Beed and Satara districts.

The study would not have been completed without the help of the faculty and supporting staff from SSE. We extend our sincere thanks and acknowledge Dr. Savita Kulkarni, Former Faculty, SSE for her inputs at the initial stage of framing the project proposal. We also acknowledge the efforts of Ms. Sampurna Sharma who worked as Research Associate for this project. Also, sincere thanks to Ms. Sushma Nayak, Visiting Faculty, SSE, for editing the report. We acknowledge Dr. Debdulal Thakur, Deputy Director, SSE, for his invaluable inputs during the tenure of the project; Ms. Manisha Sonawane, Assistant Librarian, SSE; Mr. Satish Balkawade, Office Assistant, SSE, for their help in data entry; and students Mr. Ananya Ajatasatru, Ms. Reshma Joseph, and Mr. Aditya Dhabu for their research assistance.





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## List of Abbreviations

AgL	Agricultural Laboratory
APMC	Agricultural Produce Market Committee
ANOVA	Analysis of Variance
ASHA	Accredited Social Health Activists
BANK	Number of Bank Branches
BED	Number of Hospital Beds
BPL	Below Poverty Line
CAGR	Compound Annual Growth Rate
CI	Cropping Intensity
CMIE	Centre for Monitoring Indian Economy
CREDIT	Ground Level Credit Outlets, Agribusiness Clinics and Farmer Producers Companies
CSR	Corporate Social Responsibility
EXTCAP	Total agricultural extension staff
FII	Financial Infrastructure Index
FPC	Farmer Producer Companies
GCA	Gross Cropped Area
GDP	Gross Domestic Product
GIS	Geographic Information System
Gol	Government of India
GoM	Government of Maharashtra
GSDP	Gross State Domestic Product
GSVA	Gross State Value Added
GWh	Gigawatt-Hours
HBF	Household with Banking Facility
HD	Hospitals Density
HDI	Human Development Index
HDR	Human Development Report
HDWF	Household with Drinking Water Facilities
HH	Household
HLF	Household with Latrine facilities
ICDS	Integrated Child Development Services

ID	Institutional Deliveries
INS	Insurance
IMF	International Monetary Fund
IPL	Irrigation Potential Realised
IT	Information Technology
ITES	Information Technology Enabled Services
ITI	Industrial Training Institute
JFMC	Joint Forest Management Committees
KCC	Kisan Credit Cards
KMO	Kaiser-Meyer-Oklin statistic
MANAGE	National Institute of Agricultural Extension Management
MHDR	Maharashtra Human Development Report
MOBC	Mobile Connectivity
MSAMB	Maharashtra State Agricultural Marketing Board
MSCB	Maharashtra State Co-operative Bank
MSRTC	Maharashtra State Road Transport Corporation
MT	Metric Ton
NABARD	National Bank for Agriculture and Rural Development
NCA	Net Cropped Area
NCAER	National Council of Applied Economic Research
NFSA	National Food Security Act
NIDA	NABARD Infrastructure Development Assistance
NSSO	National Sample Survey Office
NSDP	Net State Domestic Product
O&M	Operation And Maintenance
PACs	Primary Agricultural Cooperative Societies
PCA	Principal Component Analysis
PCAg	Power Consumption in Agriculture
PHC	Primary Health Centres
PII	Physical Infrastructure Index
PMGSY	Pradhan Mantri Gram Sadak Yojana
PMJDY	Pradhan Mantri Jan-Dhan Yojana

PO	Post Offices
PSC	Primary Health Sub-Centre
PUMP	Pumpsets
PUMPER	Pumpset Energised
R&D	Research and Development
RBI	Reserve Bank of India
RC	Road Connectivity
RE	Rural Electrification
RDII	Rural Development Infrastructure Index
RII	Rural Infrastructure Index
RIDF	Rural Infrastructure Development Fund
RIPF	Rural Infrastructure Promotion Fund
RLR	Rural Literacy Rate
RRB	Regional Rural Banks
SC	Scheduled Caste
SCBs	Scheduled Commercial Banks
SD	School Density
SECC	Socio Economic and Caste Census
SHGs	Self Help Groups
SII	Social Infrastructure Index
SLBC	State Level Bankers Committee
SSE	Symbiosis School of Economics
SST	Schools with more than Single Teacher
ST	Scheduled Tribes
TFP	Total Factor Productivity
TRC	Tractors Registered
U- DISE	Unified District Information System for Education
WHF	Warehouse Capacity
WSM	Wholesale Markets
WUA	Water User Associations



## Executive Summary

- i. Sound infrastructure is a key determinant for sustained economic development and growth. India is likely to emerge as the fastest growing economy for the rest of the decade, being poised at 7.4% in 2018 and estimated to increase to 7.8% by 2019 (IMF, 2018). This sustained rate of high growth cannot be achieved without adequate investment and development of infrastructure being undertaken simultaneously.
- ii. The investment requirement in infrastructure for sustainable development in India has been estimated at ₹ 50 trillion (US\$ 777.73 billion) by 2022 (IBEF, 2018). This will help address issues related to poverty, livelihoods, income, health and education.
- iii. Various studies have highlighted that well-designed infrastructure investments have long-term economic benefits. Such investments result in enhanced economic growth, productivity and land values, while providing significant positive spillovers (Bottini, Coelho and Kao, 2012). Further, adequate investment in infrastructure has the ability to address the issues of regional backwardness and imbalance (Government of Maharashtra [GoM], 2013).
- iv. India is predominantly a rural economy with a two-third population living in rural areas, 70% workforce and the rural economy constituting about 46% of the national income (Chand, Srivastava and Singh, 2017). Further, since infrastructure plays a strategic role in producing large multiplier effects in the economy with agricultural growth (Mellor, 1976), literature confirms that rural infrastructure leads to agricultural expansion by increasing yields, augmenting farmers' access to markets and amplifying availability of institutional finance.
- v. While India is heading to become more urban by 2050, what is also true is that the country will have the largest rural population globally. It is therefore imperative that rural India is also simultaneously endowed with necessary infrastructure for better liveability. This includes: rural roads, bridges and telecommunication for better connectivity; irrigation facilities, water and electricity supply for farms and households; housing, sanitation, education, health facilities, warehousing, extension services, markets and credit facilities. While this is not an exhaustive list, it is indeed crucial that rural households are able to fulfil their basic needs and enhanced socio-economic livability conditions which can facilitate a productive life.
- vi. Keeping this background in mind, the present study has been carried out for the National Bank for Agriculture and Rural Development (NABARD) by the research team of Symbiosis

School of Economics (SSE), with the prime objectives being:

- To compute the physical, social and institutional infrastructure index for all the 33 districts<sup>1</sup> of Maharashtra and rank them;
  - To compute the composite rural infrastructure index for all the districts of Maharashtra and rank them according to their performance;
  - To understand and identify the nature of disparities in rural infrastructure development with respect to each of the three dimensions (physical, social, institutional infrastructure) across the districts and eight agriculture divisions of Maharashtra;
  - To assess the status of rural infrastructure in Maharashtra and see whether there is any pattern of regionalization in the infrastructural facilities of the districts within the State;
  - To scrutinize the current field status of infrastructure based on primary survey and to prepare case studies for two select districts of Maharashtra (one of the best performing and one of the worse performing);
  - To provide a comprehensive overall policy recommendation related to rural infrastructure to the Government of Maharashtra.
- vii. The study is directed to the state of Maharashtra, which is spread over a total area of 3,07,713 sq. km., being the third largest state in India after Madhya Pradesh and Rajasthan and accounting for 9.4% of the geographical area.
- viii. As per the 2011 Census, the State with a total population of 11.24 crore has the second largest population after Uttar Pradesh, accounting for 9.3% of India's population; the decadal growth of population for Maharashtra at 15.99% is lower than the all India rate at 17.70%.
- ix. The rural population for Maharashtra stood at 6.16 crore, constituting 7.45% of the rural population of India. The State ranks fourth in the country with respect to rural population, preceded by Uttar Pradesh, Bihar and West Bengal. The number of villages in the State stood at 40,959 according to the Economic Survey of Maharashtra 2017-18, with 93.80% being inhabited villages.
- x. Maharashtra is one of the top economic performers with respect to per capita income, which is 1.6 times that of India and stood at ₹ 1,65,491 for the year 2016-17. Although the State

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<sup>1</sup> Mumbai and its suburban districts being 100% urban are excluded from the study. The newly created district of Palghar (2014) is excluded due to absence of data relating to the points of reference of the study.



registered a slower growth rate for 2017-18 at 7.3% compared to a double-digit growth rate of 10% for the preceding year, it accounts for the 14.8% of the the Gross Domestic Product (GDP) of India (GoM, 2018).

- xi. In terms of sectoral composition of Gross Value Added, the share of Agriculture & Allied Activities sector of the State has declined from 13% in 2011-12 to 10% in 2015-16 (GoM, 2018).
- xii. With respect to agriculture, the State accounts for 12.4% of the net sown area and 11.8% of the gross cropped area for the year 2014-15. The area under principal crops for the average three-year period (2012-13 to 2014-15), revealed that the State accounts for 7.9% of the total area in India for cereals and 9.2% for all food grains (cereals and pulses).
- xiii. The percentage of agricultural workers to total workers stood at 52.71% for the year 2011 for the State.
- xiv. Agriculture accounts for 12.2% of the total Gross State Value Added (GSVA) for the period 2016-17 as against 15.3% in 2001-02, exhibiting a declining trend over the period.
- xv. As per the Ninth Agricultural Census 2010-11, the average size of holding has declined for Maharashtra to 1.44 hectares in 2010-11 from 4.28 hectares in 1971.
- xvi. The 2017 Report of Niti Aayog places Maharashtra in the lead with respect to infrastructure facilities in the country with a share of 11% of the expenditure on infrastructure (GoM, 2018).
- xvii. The State has the potential to improve the Human Development Indicators and benchmark the same to the best performing states in the country.
- xviii. The Rural Development annual plan expenditure stood at ₹ 1406 crore in 2015-16 and budgeted amount for the year 2016-17 stood at ₹ 2366 crore.
- xix. The NABARD Report (June, 2018), highlights that under the Rural Infrastructure Development Fund (RIDF), the Bank has sanctioned ₹ 14914.52 crore for Maharashtra.
- xx. The study strives to take on a holistic approach by capturing varied dimensions of rural development and has considered three sets of infrastructure parameters that are capable of throwing light on the state of rural infrastructure of the State.

*Physical:* Includes 12 indicators to encompass agriculture land usage, mechanization, irrigation, electrification, transport, communication and physical spaces for enhancing agriculture productivity. These comprise: Cropping Intensity (CI), Number of Pumpsets per thousand hectares of GCA, Irrigation Potential Realised (IPR), Pumpsets Energised (PUMPER), Power Consumption in Agriculture (PCAg.), Rural Electrification (RE), Tractors

(TRC), Road Connectivity (RC), Mobile Connectivity (MOBC), Warehouse Facility (WHF), Wholesale Market (WSM), Agricultural Laboratory (AgL).

*Social:* Includes eight indicators to address issues related to education and health, viz. Rural Literacy Rate (RLR), School Density per 1000 children (SD), Schools with Single Teacher (SST), Percentage of Households with Drinking Water Facilities (HDWF), Percentage of Households with Latrine Facilities (HLF), Hospitals (HD), Beds per 1000 Persons (BED), Institutional Deliveries (ID).

*Institutional:* Encompasses eight indicators such as Percentage of Households with Banking Facilities (HBF), Banks (BANK), Primary Agricultural Cooperative societies (PACs), Credit (CREDIT), Self Help Groups (SHGs), Extension Capacity (EXTCAP), Post Offices (PO), Insurance (INS).

- xxi. The study then goes on to compute the composite rural infrastructure index for the 33 districts of Maharashtra and rank them according to their score. This will enable a full-bodied assessment of the status of rural infrastructure of not only the 33 districts of Maharashtra but also throw light on the 8 agriculture divisions in the State viz. Konkan, Nasik, Pune, Kolhapur, Aurangabad, Latur, Amravati and Nagpur.
- xxii. It will also show whether there is any pattern of regionalisation in the infrastructural facilities of the districts within the State.
- xxiii. Finally, the study has created a report card for each of the 33 districts of Maharashtra, thereby identifying the infrastructural challenges at district levels, which will help direct and channelise investment and credit in the required areas, thus addressing the various socio-economic disparities. The study will also help the district authorities to understand their positions with respect to other lead districts in Maharashtra and help them benchmark and formulate appropriate strategies.
- xxiv. The findings of the study reveal the following:
  - a. Physical Infrastructure Index (PII):
    - The districts of Kolhapur, Satara, Pune, Nasik and Gondia emerged as the best performing districts, while Osmanabad, Akola, Parbhani, Beed and Nandurbar have been identified as laggard districts.
    - With respect to the eight regions of the State, Kolhapur, Pune, Nagpur and Konkan are above the state PII average, while the regions of Latur, Amravati and Aurangabad score very poorly, with the Nasik region lying just below the state average.

b. Social Infrastructure Index (SII):

- The districts of Sindhudurg, Kolhapur, Satara, Ratnagiri and Nagpur rank very clearly as the leading districts, while on the other end of the spectrum, Nandurbar, Nanded, Jalna, Thane, and Nasik rank poorly with respect to SII.
- A study of the 33 districts reveals that 12 districts stand above the state average.
- The regions of Kolhapur, Konkan, Nagpur and Pune are above the state average. On the other hand, Amravati, Aurangabad, Latur, and Nasik lie below the state average. Thus, the eight agri-divisions of the State are not performing at par in terms of social infrastructure indicators.
- It is imperative that a primary study be undertaken for the Nasik region, with the objective to understand the causes of it being an outlier with respect to SII.

c. Institutional Infrastructure Index (III):

- It is observed that 16 districts are performing above the state average while the remaining fall under the category of laggard districts.
- Districts such as Sindhudurg, Kolhapur, Ratnagiri, Satara, Sangli and Solapur rank at the high-end, and are therefore classified as high performing districts. However, districts like Beed, Buldhana, Nanded, Hingoli, Jalgaon, Nandurbar, Thane and Dhule are lowest in relative ranking, thus falling under the category of least performing districts.
- The divisional performance suggests that the laggard districts are mainly concentrated in Nashik, Latur, Amravati and Aurangabad agricultural divisions, whilst divisions such as Kolhapur, Konkan, Pune and Nagpur are the best performing in the State.

d. Rural Development Infrastructure Index (RDII):

- The Composite Rural Infrastructure Index has been constructed on the basis of the three infrastructural indices viz. Physical, Social and Institutional indices for the 33 districts and 8 divisions of Maharashtra. It is observed that Sindhudurg, Kolhapur, Satara, Pune, Sangli, Nagpur, Ratnagiri, Gondia, Wardha and Solapur are among the top performers with respect to Composite Rural Infrastructure Index, while Osmanabad, Beed, Thane, Yavatmal, Jalgaon, Nanded, Parbhani, Dhule, Hingoli and Nandurbar are the laggard ones.

- A division-wise analysis suggests that Kolhapur, Pune, Konkan and Nagpur are performing well, while Aurangabad, Nasik and Latur are performing poorly.

e. Case Study

- In order to map and complement the findings from the secondary study, a primary study for two districts was carried out. The Beed district (Rank 25) is selected from least performing district group and Satara district (Rank 3) is identified from the best performing districts.
- The primary survey of the sample villages from Beed include Anadgoan (Taluka Shirur – Kasar) and Choramba (Taluka Dharur) and Satara district includes Ambheri and Vadi (Taluka Khatav) and Bholi from (Taluka Khandala).
- The findings of the primary survey for the sample villages, throw up mixed results with respect to all the parameters.
- This makes it imperative to make available basic infrastructure - be it physical, social or institutional for enhancing liveability at the grassroots level.

xxv. Finally, it may be inferred that the Rural Development Infrastructure Index helps in identifying and prioritizing issues by measuring a district's relative performance in terms of various infrastructure parameters. These relative results enable districts not only to assess their areas of strengths and weaknesses, but also identify other districts that may serve as exemplars, and prioritise actions accordingly. Given the realities on the ground, and uneven development in the State, the Government of Maharashtra needs to focus on providing basic infrastructure facilities in backward areas. Appropriate measures should be taken for improving governance, delivery mechanisms and efficiency of local level institutions across districts, especially in backward regions, to ensure access to various infrastructure services to the rural people. This will enable Maharashtra maintain high economic growth, improve agricultural productivity, reduce poverty and regional disparities.

# Rural Development Infrastructure Index

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## Chapter - 1

### Introduction

## 1.1 Background of the Study

In many countries in the Asia Pacific region, the provision of adequate, reliable and operative infrastructure is still a major challenge (ILO, 2018) for economic development. A sound infrastructure aids to determine sustained economic growth for an emerging economy like India through diversifying production, expanding trade, coping with mounting population growth, reducing poverty and improving environmental conditions. Both, quantitative and qualitative improvements for infrastructure, are essential to modernise and diversify production, enable countries compete internationally, and accommodate rapid urbanization (World Bank, 1994; Mody, 1997). Further, rural infrastructure is vital for developing countries from the standpoint of agricultural sustainability, agro-based industries and overall development in rural livelihood, especially for a country like India, where rural areas account for a larger part of the total geographical area. Census 2011 reports that there are 6.4 lakh villages in India, which shelter more than two-third of the country's population. Provisioning of basic infrastructure facilities for this large section of the population spread across 3.28 million sq. km. of the country's geographical area has been a major challenge (IDFC Rural Development Network, 2014). Moreover, the rural sector in India has massive potential to contribute to the overall growth with huge surplus labour and natural resources, which are the basic inputs in production process. However, lack of adequate infrastructure has been a major factor for driving the rural labour into poverty and deprivation (Kundu, 2013). Providing basic infrastructure facilities would help in tapping the vast potential available in the rural parts of the country. The development of infrastructure is crucial for meeting the Sustainable Development Goals, particularly those related to poverty, rural livelihood, income, health, education, water and sanitation. Proper rural roads, bridges, irrigation arrangements, water supplies, sanitation facilities, housing, electricity, schools, healthcare, and market access are needed in rural areas for the local population to fulfil their basic needs as well as live a socially and economically productive life. Another growing concern for India is the rising rural-urban disparities. Indian Rural Development Report 2013-14 highlights the rising rural-urban disparities in terms of real per capita consumption expenditure, which is an indicator of the standard of living. The National Sample Survey Office (NSSO) data reveals that during the period 1993-94 to 2011-12, rural real per capita consumption expenditure grew by 2.2% compared to 3.3% in urban areas. Infrastructure not only acts as a major driver in contributing to the overall productivity and inclusive development of an economy, it also improves the quality of life of the citizens. Therefore, it is utmost important to have adequate and efficient infrastructure in the rural areas in India to sustain rapid change in structural dynamics. Infrastructure development increases

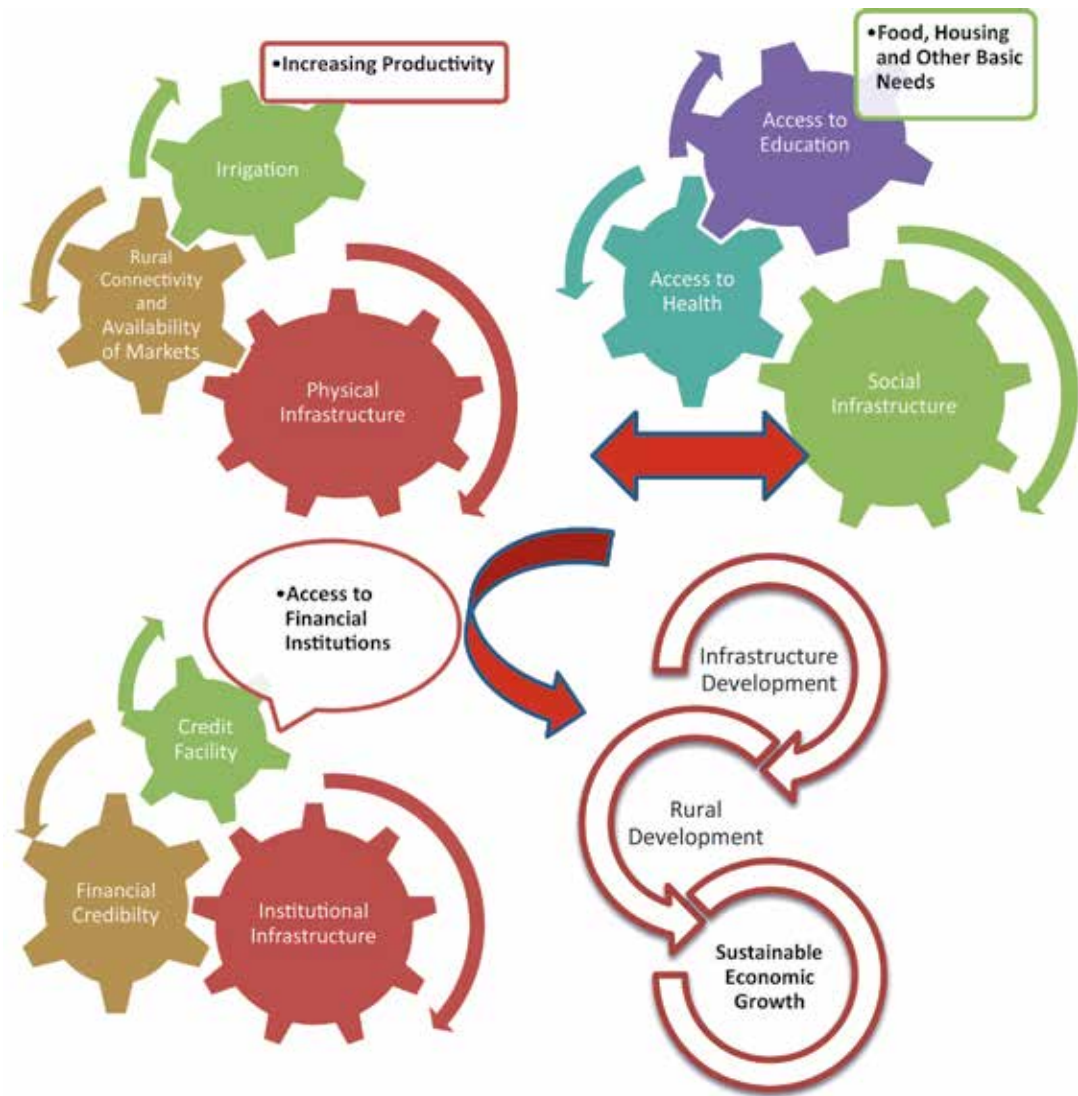
returns on private investment, setting in self-induced impetus for the regional development. As per the NSSO (2014), only 24% of rural households had access to basic services, such as on premises drinking water, sanitation and electricity, while 11% had none. Similarly, access to basic services is also unequal amongst rural households across income and social groups. Only 9% of the lowest quintile (a proxy for income) households had access to all three facilities as against 62% of the top quintile households (IDFC Rural Development Network, 2014). The Census 2011 indicates that 45% of the rural households are not connected with electricity and depend on kerosene and other means for lighting. The road network for rural India has been increased from 3,54,530 km in 1971 to 24,50,559 km in 2008 (including 10,61,809 lakh km roads created under Jawahar Rozgar Yojana and Pradhan Mantri Gram Sadak Yojana) recording an annual compound growth rate of 5.4% over this period<sup>1</sup>. However, the rural surfaced road coverage is only 33% of the total rural road network in India. Around 20.7% of the total 206 million (or 20.6 crore) occupied rural houses are with thatched roofs as per Census 2011.

Infrastructure contributes significantly to the development of backward regions and removal of regional disparities. Therefore, comparative performance of local level districts or talukas within a state has become an important area of research for a number of reasons. Given the widespread regional disparities in a state, a study of parts (i.e. districts) becomes important if the sum of parts (i.e. the state) needs to progress in a balanced way. In addition, district-wise study brings out a base for district-wise policy prescription and road map at local level for successful implementation of the policy. Moreover, all the states in India have state-specific requirements to meet their developmental aspirations and targets, of which poverty alleviation and the creation of infrastructure, command high priority for faster and more inclusive growth. Thus, a similar kind of study can be adapted for other states as well to examine the status of the districts in terms of physical, institutional and social infrastructure; this can help track the requirement for specific infrastructural development, which lays significant emphasis on the issue of sustainability. The current policy level emphasis should be on strengthening the capacity at a local level to build and maintain the rural infrastructure using local resource-based methods for securing the necessary policy framework and executing arrangements for local resource-based rural infrastructure works.

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<sup>1</sup> Kundu, S. (2013, November 16). Rural Infrastructure. Retrieved from <http://www.cbgaindia.org/opinion/rural-infrastructure/>

**Figure 1.1: Conceptual Framework for Relationship between Infrastructure Development and Sustainable Economic Growth**



Source: Authors' own

There is no second thought that infrastructure is the essential key for the development of any economy. In rural sector, agricultural productivity increases with proper irrigation facility, land quality, efficient road transport, telecommunications, electricity, etc. These parameters play a crucial role in promoting physical infrastructure quality of a rural economy. On the other hand, affordability of basic services, access to health and sanitation, housing, and educational facilities,



contribute to strengthen social infrastructure and thereby act as a catalyst in reduction of economic disparity, poverty and deprivations within an economy. Additionally, access to formal financial sector adds the ability to invest and reinforce the productive capacity of rural households through increasing the factor productivity of land, labour and capital in the production process. Hence, these three important parameters of rural infrastructure are considered as pre-conditions for sustainable rural development and thus strongly influence to improve the quality of life of the people and sustainable rural livelihood. This has been established by growth theories and empirical evidences have been discussed in the next section.

## 1.2 Review of Literature

Infrastructure, which primarily includes physical infrastructure, social infrastructure and economic infrastructure (Chan et al., 2009) has a two-way causal relationship with economic growth. It signifies that economic growth is derived from infrastructure sector which further provides inputs for agriculture, manufacturing, etc.; at the same time, growth places demand on infrastructure. Thus, inadequate availability of the former results in sub-optimal utilization of resources in the latter. Studies have shown that well-designed infrastructure investments have long-term economic benefits; they can raise economic growth, productivity, and land values, while providing significant positive spillovers (Bottini, Coelho & Kao, 2012). Studies from Indian settings also document evidence of positive linkages between various types of infrastructure and agricultural output growth (Antle, 1983). Adequate and well-maintained infrastructure is a necessary condition for economic growth and poverty reduction. Access to roads, water, sewer, communication technologies, and electricity are all essential to the economy. Rural infrastructure (both physical and institutional) such as irrigation, watershed development, rural electrification, roads, markets, credit institutions, rural literacy, agricultural research and extension, etc., together play a key role in determining the agricultural output in India. For instance, irrigation infrastructure, increases the land use intensity and cropping intensity, provides incentives to farmers to use yield increasing inputs and thus results in higher agricultural output (Dhawan, 1988; Shah, 1993; Vaidyanathan et al. 1994; Narayanamoorthy and Deshpande, 2005). Canal and tank irrigation constitute a larger irrigated area, because of its better reliability and controllability (Barnes and Binswanger, 1986; Dhawan, 1988; Vaidyanathan et al., 1994; Shah et al., 2006). Rural roads increase the diffusion of agricultural technology by improving access to markets, enhance more efficient allocation of resources, reduce the transaction costs, as well as help the farmers to realise better input and output prices (Ahmed and Donovan, 1992; ESCAP, 2000; van de Walle, 2002). Improved road infrastructure also enhances the transport facility through which the rural farm households can have access to better health care, education and credit facility. Rural-urban

linkages are developed through road development, which further helps strengthen the backward and forward linkages in the agricultural sector. Institutional infrastructure such as markets and credit facility also play a pivotal role in the growth of agricultural sector (Binswanger et al., 1993). Better access to institutional credit reduces the cost of borrowings (Ramachandran and Swaminathan, 2002) and increases farmer's investments in production durables such as bullocks, tractors and implements (Rosenzweig and Wolpin, 1993). Better access to markets bolsters farm productivity and profitability (Ahmed and Hossain, 1990; Ali and Pernia, 2003). Infrastructure is always considered an umbrella term for generating social overhead capital by many economists such as Lewis (1955), Rosenstein-Rodan (1943) and Hirschman (1958). In his theory of 'Stages of Growth,' Rostow considered social overhead capital, especially in transport and communication, as one of the main pre-conditions for take-off (Rostow, 1960). Later, emphasis was laid on agricultural research, extension and rural financial institutions as important elements of infrastructure, due to increasing recognition of the role of agriculture in economic development and the vital role that infrastructure plays in generating agricultural growth (de Vries, 1960; Ishikawa, 1967). Rural infrastructure contains many attributes of infrastructure that make it difficult for individuals to design, construct, operate and maintain these services effectively and efficiently. It has been considered that infrastructure plays a strategic role in producing large multiplier effects in the economy with agricultural growth (Mellor, 1976). Rural infrastructure leads to agricultural expansion by increasing farm yields, augmenting farmers' access to markets and availability of institutional finance. The linkages between infrastructure development and sustained output growth have been documented by many global empirical studies (Aschauer, 1989; Canning, 1998; Calderon and Chong, 2004). Binswanger et al. (1993), in a study of 13 states in India, established that investments in rural infrastructure lowered transportation costs, increased farmers' access to markets, and led to substantial agricultural expansion. Better connectivity also lowered the transaction costs of credit services, resulting in increased lending to farmers, higher demands for agricultural inputs, and higher crop yields. Fan et al. (2000) extended these outcomes to express that rural infrastructure is not only an important driver for total factor productivity (TFP) growth, but also directly contributes to a substantial reduction in rural poverty. The study concludes that improved rural infrastructure and technology have all contributed to agricultural growth, but their impacts have varied by settings. "Government expenditures on roads and R&D have by far the largest impact on poverty reduction and growth in agricultural productivity; they are attractive win-win strategies. Government spending on education has the third largest impact on rural poverty and productivity growth. Irrigation investment has had only modest impacts on growth in agricultural productivity and rural poverty reduction, even after allowing for trickle-down benefits" (Fan et al., 2000, p.1050).

Thorat and Sirohi (2004) highlight the critical role of transportation and communication systems in explaining the geographical variations in intensity of farming systems and productivity of labour. Antle (1983) points out that development of infrastructure increases aggregate agricultural productivity by increasing the efficiency of resource utilization on the aggregate level. Pinstrup-Andersen and Shimokawa (2008) argue that increasing agricultural productivity is an effective driver of economic growth and poverty reduction, both within and outside agricultural sectors. They further point that raising productivity requires adequate rural infrastructure, well-functioning domestic markets, competent institutions, and access to appropriate technology. Development of infrastructure more equitably distributes the new technology, and hence its benefits in the agricultural sector are manifold. Similarly, Mellor (1976) indicates that infrastructure plays a strategic role in producing large multiplier effects in the economy with agricultural growth. There are several empirical studies viz. Binswanger et al. (1987, 1993); Evenson (1986); Ahmed and Hussain (1990); NCAER (1977) highlighting the impact of physical infrastructure on agricultural development. Besides roads, government spending on agricultural research and rural education infrastructure have been contributing to the reduction in rural poverty and growth in agricultural productivity. In addition, there is evidence that the absence of adequate infrastructure in rural areas serves as push factor for migration from rural areas to urban areas (Toyobo, 2014).

There have been few studies in India, which have attempted to compute infrastructure index. Ghosh and De (1998) and Bhatia (1999) prepared a State Level Infrastructure Index for India. Ghosh and De (1998) computed an index based on three parameters viz. transport, power, and irrigation. A Principal Component Analysis<sup>2</sup> (PCA) was used to compute an index, which was used as an indicator for physical infrastructure development to measure the impact of public investment and physical infrastructure on both private investment behaviour and regional economic development. Results indicated that regional imbalance in physical infrastructure is responsible for rising income disparity across the states in India.

Bhatia's (1999) work was a novel attempt to build a composite index of rural infrastructure state-wise and examined relationship between infrastructure development and levels of production and growth in agriculture. The paper employed 14 sub-items of agricultural infrastructure which were identified under nine major sub-heads viz. transport, power, irrigation, fertiliser, agricultural credit, health, agricultural marketing, agricultural extension, and agricultural research. The paper provided ad-hoc weights to the above-mentioned nine major sub-heads, with highest weights

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<sup>2</sup> Factor analysis attempts to identify underlying variables, or factors, that explain the pattern of correlations within a set of observed variables. Factor analysis is often used in data reduction, by identifying a small number of factors, which explain most of the variance observed in a much larger number of manifest variables. In the PCA approach, the first principal component is the linear combination of items, which explains the maximum variance across the observation at a point in time.

being assigned to irrigation and marketing facilities for agricultural development. All the states, with a level of infrastructural activity equal to or higher than the particular specification, were given full score for that item, and other states were accordingly assigned scores in proportion to their level and the desired level of infrastructure activity. Results of the study indicated that overall index of infrastructure is highest in Punjab followed by Kerala, Tamil Nadu and Haryana. The study found that states had disparities in different dimensions of agricultural infrastructure. For instance, Rajasthan has low level of development in irrigation, fertiliser sale depot, transport, agricultural marketing and rural health. Bihar has low index in infrastructural activities of rural transport, credit, rural health, agricultural marketing and extension services. Madhya Pradesh has poor infrastructure in terms of irrigation, transport, fertiliser sale depot, rural health, agricultural marketing and research support. Uttar Pradesh has inadequate facilities in terms of transport, credit, rural health, agricultural marketing and extension, while West Bengal has poor infrastructure in terms of power, irrigation, agricultural marketing and extension, besides poor research support. The regression results confirmed that the index of agriculture infrastructure is significantly influencing the per hectare yield of food grains and value of output from agriculture in the states.

Sarma (2013) and Nayak (2014) attempted a district-level rural infrastructure index for the states of Assam and Orissa respectively. Sarma (2013) computed rural infrastructure index as a composite index of two-dimension indices of rural road index and rural electricity index. The dimension indices measured availability of rural road connectivity and status of rural electricity supply, the two basic components of infrastructure services in the rural areas across districts in Assam. The rural road index consisted of two indicators: rural roads per lakh of rural population, and rural roads per hundred sq. km. of rural geographical area, of each district. Rural roads per lakh of rural population may overstate the rural road availability in the thinly populated districts whereas rural road per hundred sq. km. of rural geographical area may understate the rural road availability in the thickly populated districts. Hence, Sarma (2013) combined the two indicators. Results of the study indicated variations across districts in case of availability of rural infrastructure in terms of overall infrastructure index based on availability of rural roads and rural electricity supply. Disparities were found in the districts of Assam, whereby the upper Assam districts were better placed in terms of rural infrastructure compared to most of the districts in lower Assam. This study based on the primary and secondary data analysis found that districts lagging behind in rural development are found to have poor state of rural infrastructure.

Nayak (2014) prepared three separate indices, viz. Physical Infrastructure Index (PII), Social Infrastructure Index (SII), and Financial Infrastructure Index (FII), district-wise for the state of Odisha by using the PCA. These three indices were then combined to find the overall Rural

Infrastructure Index (RII). The number of principal components were finalised on the basis of Eigen value (higher than 1) and the Bartlett Criterion. The study observed that there exists regional disparity in the stock of rural infrastructure in all the three forms. The coastal region of the state was found to be ahead in all the three categories of infrastructure, albeit with some exceptions. Regression results indicated that infrastructure has a significant impact on cropping intensity in agriculture. Out of the three categories of infrastructure, physical infrastructure had an edge over social and financial infrastructure.

Bakshi, Chawla, and Shah (2015) did not compute an infrastructure index, but an index for all districts of India capturing the multidimensional character of backwardness based on 2011 Census data. The study captured backwardness based on three concepts (and their respective variables) viz. (a) Economic Diversification of Agriculture (workers as a percent of total workers); (b) Human Development [Female illiteracy rate (7+ years)]; (c) Quality of Infrastructure: Households without electricity, without drinking water, sanitation facilities and access to banking services respectively. The study computed the backward index based on Equal Weights Formulation method and PCA.

Debroy and Bhandari (2003) reached similar conclusions. The regional disparities with respect to income and infrastructure existed not only between the states but also within the states. For e.g. the coefficient of variation of Per Capita Net State Domestic Product (NSDP) increased from around 28% in the early 1980s to 36% in 2004-05 and further to 41% in 2011-12 (Bakshi et al., 2015).

Therefore, infrastructure development is vital for rural development and reducing regional disparities between states and within states. Given the importance of this aspect, there exist few studies assessing the status of infrastructure at local level for different states, but hardly any for Maharashtra. Although there are ample studies on the status of infrastructure development across different states, there are hardly any studies available at district level, particularly for rural areas. Therefore, a study assessing the infrastructure conditions for rural areas at district level is vital for balanced regional development and fostering agricultural sector at local level. In this context, the objective of this study is to construct a rural infrastructure index across 33 districts of Maharashtra.

### 1.3 Objectives of the Study

- i. To compute the physical infrastructure index for all the districts of Maharashtra and rank them;
- ii. To calculate the social infrastructure index for all the districts of Maharashtra and rank them;
- iii. To estimate the institutional infrastructure index for all the districts of Maharashtra and rank them;
- iv. To compute the rural infrastructure index (composite index) for all the districts of Maharashtra and rank them according to their performance;
- v. To understand and identify the nature of disparities in rural infrastructure development with respect to each of the three dimensions (physical, social, institutional infrastructure) across the districts and eight divisions of Maharashtra;
- vi. To assess the status of rural infrastructure in Maharashtra to see whether there is any pattern of regionalization in the infrastructural facilities of the districts within the State;
- vii. To provide indicator-wise report card for all the districts considered for the study, and to have district-wise comprehensive reference related to all indicators of rural infrastructure of Maharashtra;
- viii. To scrutinize the current field status of infrastructure based on primary survey and to make case studies for two select districts of Maharashtra (one of the best performing and one of the worse performing districts).

### 1.4 Rationale for Choice of State: Why Maharashtra?

The State of Maharashtra is one of the top economic performers with respect to per capita income, which is 1.5 times that of all India according to figures for the year 2015-16 (Government of Maharashtra [GoM], 2017), where Maharashtra's Gross State Domestic Product (GSDP) grew faster than the India average. Although Maharashtra is India's leading industrial State with 33.6% of the GSDP contributing 13% of national industrial output, almost 51% of the people are employed in agriculture and allied activities. The Gross State Value Added (GSVA) of 'Agriculture & Allied Activities' sector had an average share of 11.9% in the total GSVA in 2017, and is growing at an average annual rate of 2.0%. However, the average share of GSVA of 'Industry' sector is 33.6% with 6.1% of average annual growth rate. Therefore, it generates enormous urban-rural divergence and regional disparities in per capita income. The co-existence of affluence and deprivation in the State is a matter of grave concern.

Further, it is observed that agriculture in Maharashtra is heavily dependent on monsoons as barely 15% of the Gross Cropped Area (GCA) is irrigated. This is much less, even lesser than half the national average where 38.7% of gross cropped area is irrigated. Hence, despite having productive capacity, production has been less than expected. Since agriculture is one of the main sectors of the State's economy, it is necessary to observe how this sector is growing and whether infrastructure is sufficient to bring out the potential outcome in this sector. The operation and maintenance (O&M) of the irrigation infrastructure remains the responsibility of the Government. Risk and vulnerability have been identified as key features of rural livelihoods and the abject poor, and are currently a focus of policy attention for the State.

In 2013-14, only six districts, three in Konkan region (Mumbai, undivided Thane and Raigad), in addition to Pune, Nagpur and Kolhapur had per capita monthly net district product above state average (GoM, 2014a). The remaining 30 districts had per capita district domestic product below the state average. It is in these districts that agriculture is the main economic activity. Agriculture has exhibited relatively poor performance compared to the other sectors in Maharashtra. The share of agriculture in Net State Value Added has come down from 16.7% to 11.4% in 2015-16 with respect to the previous year. Its declining contribution to Net State Value Added share, despite 74% of rural population being involved in this sector, is a testimony to the relatively poor performance (GoM, 2017a). Moreover, agricultural sector shows instability in crop production and significant regional variations in its performance across the State. Additionally, agricultural productivity has declined for major crops over time and productivity of various crops is relatively low in the State as compared to the all-India average (Kannan, 2011). This is creating more imbalances across districts and rural-urban disparities within districts. The process of agricultural development in Maharashtra over the last three decades indicates regional inequality in which Western Maharashtra remained much ahead of other regions in terms of major development indicators. This has been well brought out by Apte, Bodhke and Dhume (2014); Kalamkar (2011); Mohanty (2009); and Suryanarayana (2009). Shroff, Kajale and Bodhke (2015) have reported that Maharashtra is a high cost state, which makes agriculture economically unviable. They suggest that in order to prevent agrarian distress, productivity levels of all crops have to rise for which strengthening of input supply, protective and productive irrigation, competition in marketing, and sound infrastructure are required.

Kelkar Committee (2013) (cited as GoM, 2013) has suggested various approaches for accelerating growth in backward regions that includes infrastructure development. In this regard, infrastructure development in rural areas assumes primary importance as it has significant links with agricultural sector. Developing infrastructure in rural areas can act as a strategy to minimise regional differences, boosting agricultural productivity and increasing employment opportunities.

Given the importance of infrastructural facilities for regional development in general and rural development in particular, this study assesses the state of rural infrastructure by constructing rural infrastructure index for 33 districts of Maharashtra. Although Maharashtra is among the leading states for fruits and vegetables production and a progressive farming community (GoM, 2010), it is also among the states with rural distress. There also exist certain constraints and regional disparities in the State regarding agricultural development. The study shall assess the status of different aspects (physical, social, and institutional) of rural infrastructure at the district-level for the State of Maharashtra. This study will help to identify laggard districts in different aspects of infrastructure and help frame appropriate policies. Specifically, it will help the policy makers and bankers of the development banks in rationalising their credit planning and disbursement/ allocation of credit to the most desired directions keeping in mind various economic disparities. Therefore, it is widely believed that provision of rural infrastructure remains poor in most parts of rural Maharashtra and this constrains agricultural output growth. The exact linkages between infrastructure and output growth, specifically for rural areas, remain uncertain.

The map of the State of Maharashtra highlighting the districts is depicted in Figure 1.2.

**Figure 1.2: Map of Maharashtra**



Source: Compiled through Geographic Information System (GIS)



## 1.5 Significance of the Study

Designing policy planning with a bottom-up approach helps to attain optimal outcome in terms of rural development. The 73<sup>rd</sup> and 74<sup>th</sup> Constitutional amendments attained substantial significance in the process of decentralized planning. In this decentralized planning process, district occupies a pertinent position. Moreover, the non-availability of suitable data for preparation of roadmap and lack of adequate administrative setup below district level, added relevance to district level planning as well. There is a dire need for district level planning for rural development in Maharashtra, given its diversity in socio-economic environment and productive capacity in agriculture.

In brief, the study shall construct a comprehensive Rural Infrastructure Index at the district level for the state of Maharashtra. It would also assess and identify the infrastructure shortfall at district level. Therefore, it will help the Government of Maharashtra to plan and prioritise infrastructure development for laggard districts. The study shall identify the various dimensions of infrastructure gaps at the district level, which shall be useful for planners (such as NABARD) for credit planning.

## 1.6 Organization of the Chapters

The report stands structured into eight chapters including introduction as the first chapter and conclusion as the final chapter of the study. Apart from the main study, one case study has been included in annexure to capture ground level reality and develop a comparative static analysis.

Chapter two discusses infrastructure and other characteristics of the State including its structural configuration in order to articulate the backdrop framework of the study. This chapter provides a socio-economic and demographic profile of Maharashtra, and compares the performance of the State with respect to certain select human development indicators considering the national average of other high performing states, elaborating on the given administrative setup of the State. Further, the chapter highlights the State's sectoral structure and its share of output with respect to the GSDP. Additionally, it describes the status of key financial indicators of state finance and compares the same with the top performing states.

Chapter three discusses the selection of the variables for analysis, the sources of secondary data and the step by step procedure for creating the composite rural infrastructure index for the 33 districts of Maharashtra as well as for eight agricultural divisions. It explains the normalisation process for each variable and the definition of the select variables for each dimension of the index. A detailed depiction of PCA has been given in this chapter. It also includes description of tests of analysis of variance which has been used for comparative static analysis. Finally, it outlines sample

selection process for the two case studies which are auxiliary primary survey-based reports in the study.

Chapter four estimates the Physical Infrastructure Index for the districts and eight divisions of the State using a set of 12 parameters covering different aspects of agriculture and rural development. The result displays that the all the districts under Kolhapur and Pune division and select districts of Nagpur division are well-equipped with respect to the physical infrastructure facilities. This is primarily because of good connectivity with respect to rural roads and telecommunication, marketing facilities and crop diversification towards high valued crops. On the other hand, the districts of Latur, Amravati, Aurangabad, and Nashik divisions are lagging behind in terms of status of physical infrastructure because of deficiency in irrigation facility and non-availability of proper road connectivity.

Chapter five computes Social Infrastructure Index using PCA for all the select districts. It considers education, health, housing and amenities. The chapter provides relative rankings of 33 districts on social infrastructure for the state of Maharashtra. The ranking of the districts indicates that there exists widespread inequality among districts in Maharashtra. Districts like Sindhudurg, Kolhapur, Ratnagiri, Satara, Nagpur, Sangli, Wardha and Bhandara are well developed and best performing districts, while, Nanded, Aurangabad, Thane, Parbhani, Dhule, Jalna, Latur and Nandurbar are comparatively poor performing districts in Maharashtra. This chapter also sorts division-wise ranking which indicates that most of the backward or laggard districts are in Nasik, Latur and Aurangabad. In this scenario, Maharashtra requires higher and effective investments in social infrastructure such as education, health, housing amenities and environment in backward districts in order to achieve balanced regional development.

Chapter six constructs Institutional Infrastructure Index using PCA for all the select districts. This chapter provides relative rankings of districts using eight institutional parameters for effective functioning and monitoring of instructional infrastructure. The relative ranking of the districts indicates that there exists large inequality among districts in Maharashtra. Districts such as Sindhudurg, Kolhapur, Ratnagiri, Satara, Sangli and Solapur are relatively better performing compared to other districts, therefore, classified as high performing districts. However, districts like Beed, Buldhana, Nanded, Hingoli, Jalgaon, Nandurbar, Thane and Dhule are relatively low in ranking, falling under least performing districts. Likewise, laggard districts identified are Nasik, Latur and Aurangabad divisions.

Chapter seven creates Rural Infrastructure Development Index on the basis of three dimensions physical, social and institutional for the 33 districts and 8 agricultural divisions of Maharashtra and ranks the districts with respect to their relative performance. It shows complete polarisation

in terms of access to rural infrastructure across the districts of Maharashtra. It includes a sensitivity analysis to judge the basis of nexus among the parameters of rural development and rural infrastructure index for the districts studied.

Chapter eight concludes the study with specific policy recommendations for the improvement of rural infrastructure status for the State as a whole. Moreover, it examines district-wise requirement and provides district-wise report cards for each of the 28 parameters. Last but not the least, it suggests a road map for each variable by benchmarking it to the top performing at state level or following recommendations by standard national and international policy prescriptions for the respective sector.

Apart from the analysis based on secondary data, the study has undertaken to assess the quantity and quality of rural infrastructure development in two sample villages of Beed and three select villages in Satara district of Maharashtra based on a primary survey, presented in Annexure A. By conditing focused group discussions and self-surveyed data, the quality of infrastructure has been examined using all the 28 parameters considered for the study. The accessibility and utilisation of the services in the sample areas have been evaluated. It is observed that within the sample villages, there is lack of basic infrastructure pertaining to access to drinking water and toilet facilities. Most of the internal roads within villages are unsurfaced. The infrastructure of Zilla Parishad schools requires enormous improvement in basic services like toilets and drinking water. Moreover, irrigation infrastructure needs to be enhanced especially in Beed district.



# Rural Development Infrastructure Index

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## Chapter - 2

### Overview of Maharashtra State

## 2.1 Introduction

Maharashtra is considered to be the most industrialized, second most urbanized and second richest state in India if per capita income is considered to be an indicator of financial health. It is spread over a total area of 3,07,713 sq. km., and area-wise, it is the third largest state in India after Madhya Pradesh and Rajasthan (GoM, 2017a).

## 2.2 Administration

During 2015-16, there were 43665 villages in the State with 93.80% being inhabited villages and having more than 150 towns that have emerged and been created, over the last three decades. Maharashtra has been the pivot of the structure of administration like other major states in India. Presently, Maharashtra is divided into 36 districts and each district is the administrative unit for decentralized planning below the state level as it possesses the required heterogeneity with respect to geography, socio-economic conditions and political sentiments.

**Figure 2.1 : Map of Maharashtra: the Districts and Towns of the State**



Source: Maps of India, <https://www.mapsofindia.com/maps/maharashtra/maharashtra.htm> accessed on 10 March 2018.

Further, Table 2.1 gives an idea about the administrative structure of Maharashtra over the last four decades.

**Table 2.1: Administrative Setup (in Numbers)**

Item	1980-81	1990-91	2000-01	2010-11	2015-16
Districts	28	31	35	35	36
Towns	307	336	378	534	534
Talukas	301	303	353	355	355
Un-inhabited villages	2,479	2,613	2,616	2,706	2,706
Inhabited villages	39,354	40,412	41,095	40,959	40,959

Source: GoM (2017a)

The 73<sup>rd</sup> & 74<sup>th</sup> Constitutional Amendments (1992) have brought into existence democratically elected grass-root institutions of local self-governance. This has enhanced the demand for local level statistics and necessitated requirement of developing basic capabilities at grass-root levels to organize such statistics in a harmonious manner. It will enable Maharashtra to make state-level inclusive development policies by using statistics at local level.

**Table 2.2: Local Self-Govt. Institutions (in Numbers)**

Heads	1980-81	1990-91	2000-01	2010-11	2015-16
<b>Panchayati Raj Institutions</b>					
Zilla Parishads	25	29	33	33	34
Panchayat Samitees	296	298	321	351	351
Gram Panchayats	24,281	25,827	27,735	27,913	28,332
<b>Urban Local Bodies</b>					
Municipal Corporations	5	11	15	23	27
Municipal Councils	220	228	228	222	234
Nagar Panchayat	--	--	3	4	124
Cantonment Boards	7	7	7	7	7

Source: GoM (2017a)

The state of Maharashtra came into existence on 1st May, 1960. Initially there were 26 districts. Later on, ten more districts have been created. Currently 36 districts in Maharashtra are grouped into six administrative divisions on the basis of geographical, political and historical background. There are eight agricultural divisions which are as follows:

1) Konkan Division, 2) Nashik Division, 3) Kolhapur Division, 4) Pune Division, 5) Aurangabad Division, 6) Latur Division, 7) Amravati Division, 8) Nagpur Division.

## 2.3 Demography

The Economic Survey of Maharashtra 2016-17 (cited as GoM, 2017a) states that Maharashtra's population increased from 9.69 crore in 2001 to 11.24 crore in 2011 recording a growth of 16%. The density of population of Maharashtra during the last decade increased from 315 persons per sq. km. to 365 persons per sq. km. vis-à-vis the all India average of 382. In comparison to other states, Maharashtra ranks 7 out of 15 major states in decadal population growth. Decadal population growth has been decreasing over last three decades as shown in Table 2.3. It is even less than all India average.

**Table 2.3: State-wise Decadal Growth Rate of Population (Percent)**

States	1981-1991	1991-2001	2001-2011	Rank for (1991-2001)	Rank for (2001-2011)	Magnitude of Change in Ranks between 1991-2001 and 2001-2011
Bihar	23.38	28.62	25.04	1	1	↔
Haryana	27.41	28.43	19.90	2	5	↓
Rajasthan	28.44	28.41	21.31	3	2	↑
Uttar Pradesh	25.61	25.85	20.23	4	4	↔
Madhya Pradesh	27.24	24.26	20.35	5	3	↑
Maharashtra	25.73	22.73	15.99	6	7	↓
Gujarat	21.19	22.66	19.28	7	6	↑
Punjab	20.81	20.10	13.89	8	11	↓
West Bengal	24.73	17.77	13.84	9	12	↓
Himachal Pradesh	20.79	17.54	12.94	10	13	↓
Karnataka	21.12	17.51	15.60	11	9	↑
Odisha	20.06	16.25	14.05	12	10	↑
Andhra Pradesh	24.20	14.59	10.98	13	14	↓
Tamil Nadu	15.39	11.72	15.61	14	8	↑
Kerala	14.32	9.43	4.91	15	15	↔
ALL INDIA	23.87	21.54	17.70			

Source: Census of India, various years.

Note: Rank of Maharashtra is out of 15 major states

During the period 1961 to 2011, the population grew from 4 crore to 11 crore, with a decadal population growth rate in the range of 23-27% (1961-2001). However the growth rate in the period 2001-11 was 16%. Maharashtra is at stage three of the four stage model of demographic transition (GoM, 2014b). The State's population increased from 9.69 crore in 2001 to 11.24 crore in 2011 recording a growth of 16%. The percentage of population below the poverty line at 20%



was lower than the all India average of 29.5% (Planning Commission, 2014). A quick comparison of Maharashtra with other states for select demographic indicators (other than what has been mentioned above) would be meaningful at this juncture (refer Table 2.4).

**Table 2.4: Comparison of Key Demographic Indicators for 2011**

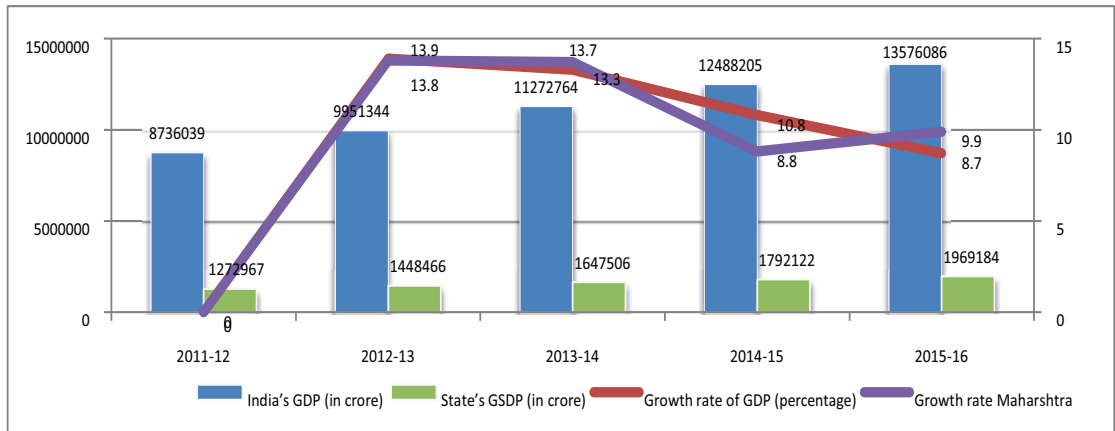
Indicator	Maharashtra	State Rank	Rank 1 State
Geographical area (lakh sq. km.)	3.08	2	Rajasthan (3.42)
Population (lakhs)	1123.74	2	Uttar Pradesh (1998.12)
Density of population (per sq. km.)	365	12	Delhi (11320)
Urban population to total population (%)	45.22	6	Delhi (97.5)
State population to all India population (%)	9.28	2	Uttar Pradesh (16.5)
Decennial growth rate of population (%) (2001- 2011)	16	17	Meghalaya (27.95)
Sex ratio	929	18	Kerala (1084)
SC and ST population to total population (%)	21.17	21	Mizoram (94.54)
Main workers to total population (%)	38.94	2	Andhra Pradesh (39.06)
Agricultural workers to total workers (%)	52.71	15	Chhattisgarh (74.68)
Female workers' participation rate	31.06	13	Himachal Pradesh (44.82)

Source: Maharashtra State Data Bank (n.d.)

Note: Rank of Maharashtra is based considering all states in India

## 2.4 Economy

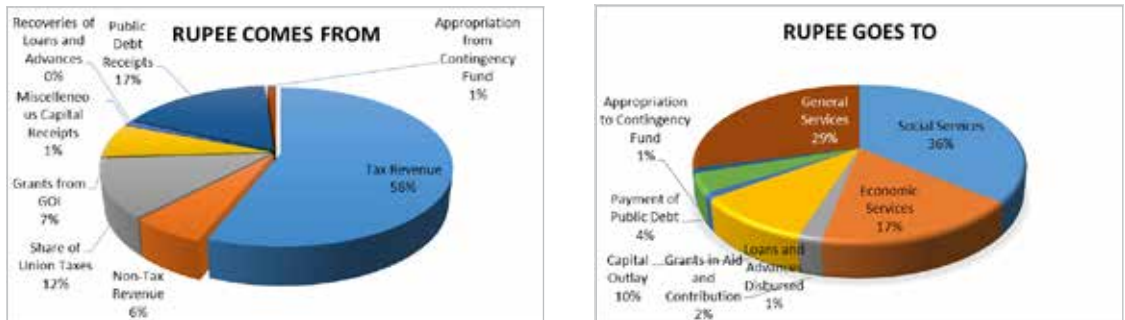
The GSDP, being the market value of all officially recognized final goods and services produced within the state in a given period, is an accepted parameter to gauge the growth of the state economy. The GSDP, thus, indicates the standard of living of the state's population. The trends in the annual growth of India's Gross Domestic Product (GDP) at current prices are indicated in Figure 2.2.

**Figure 2.2: Growth Trend in Maharashtra and India**

Source: GoM (2014a, 2015, 2017a)

Figure 2.2 shows a comparison between growth rates of GSDP in Maharashtra with that of India's GDP; when compared with the national figures, during 2014-15, the growth rate of GSDP in Maharashtra was lower (8.8%), whereas the same was higher (9.9%) during 2015-16. However, it can be noted that, though the State GSDP was almost matching with the GDP growth rate during 2011-12, the GSDP has fallen from a high of 13.8% during 2012-13 to 8.8% in 2014-15 and has inched up to 9.9% during 2015-16, against 8.7% for India.

To strengthen the fiscal situation of the State, the Government of Maharashtra achieved two of the three major parameters specified by the 14th Finance Commission. Firstly, it achieved the fiscal deficit at 1.4% of GSDP and secondly, the ratio of debt to GSDP at 17.8%. This debt to GSDP ratio achieved by Maharashtra was much lower than the norm prescribed (21.9%). The third parameter related to interest payment/revenue receipt at 14% was actually much higher (12%) than the 14th Finance Commission norm (Comptroller and Auditor General of India, 2017). Nonetheless, a close look at the sources of revenue for the government and the expenditure would help us understand the fiscal situation in a much better way. Figure 2.3 provides us with a snapshot on the same.

**Figure 2.3: State Finances of Maharashtra: A Glimpse of 2015-16**

Source: Comptroller and Auditor General of India (2017, p. 3)

A detailed time series data on the various sources of revenue for the last few years is provided in Table 2.5. It is evident from the table that the total receipts of the State increased by ₹96,950 crore (48%) from ₹2,00,653 crore in 2011-12 to ₹2,97,603 crore in 2015-16. The annual growth rate also showed a rising trend till 2014-15. The share of revenue receipts in total receipts of the State increased from 60% in 2011-12 to 62% in 2015-16 while the share of public account receipts in total receipts of the State decreased from 27% in 2011-12 to 24% in 2015-16. On the expenditure side, the State government's revenue expenditure, especially on wages, pension and interest, is estimated at ₹91,924 crore in 2016-17, as against ₹90,092 crore a year earlier. Capital expenditure is set to grow by 17.1% to ₹46,309 crore as against ₹39,714 crore in 2015-16. The per capita income for the State as a whole has grown by 11.4% to ₹1,46,399 in 2015-16 against ₹1,32,341 in 2014-15. Maharashtra is second only to Karnataka, whose per capita income stands at ₹1,48,485.

**Table 2.5: Revenue Sources-Government of Maharashtra (Various Years)**

Sources of Receipts (in Crore)	2011-12	2012-13	2013-14	2014-15	2015-16
Revenue Receipts	121286	142947	149822	165415	185036
Capital Receipts	25467	22588	27463	30348	38858
Contingency Fund	511	875	860	4360	962
Public Accounts Receipts	53389	47060	64020	83022	72747
Total	200653	213470	242165	283145	297603
Yearly Increment in Total Receipts	NA	12817	28695	40980	14458
Annual Growth (%)	NA	6.39	13.44	16.92	5.11

Source: Comptroller and Auditor General of India (2017)

The Economic Survey for Maharashtra 2016-17 (cited as GoM, 2017a) states that the GSDP for 2016-17 is expected to grow by 9.4% compared to 8.5% in 2015-16. This flow in growth is largely due to a 12.5% growth in agriculture, 10.2% in electricity, gas, water supply and other utility services and 10.8% in services. The government expects that the economy of Maharashtra will grow faster than the Indian economy, which is expected to grow by 7.1% in 2016-17.

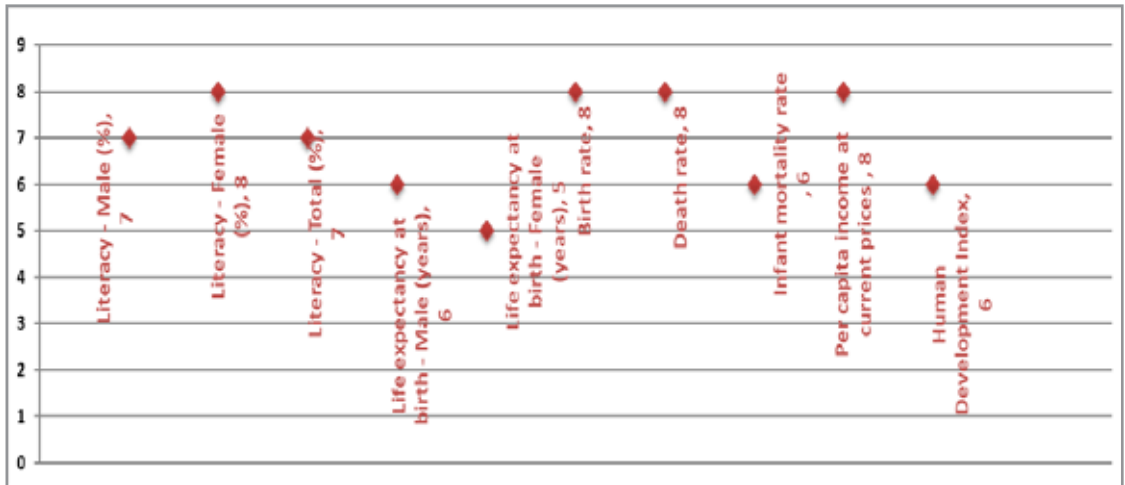
## 2.5 Social, Physical and Institutional Indicators

To assess the social indicators of a state, the Human Development Index is a reliable document to quote at the first instance. According to the Maharashtra Human Development Report 2012 (cited as YASHADA, 2014), Human Development Index (HDI) for the State stood at 0.752 and rank six; the State needs to progressively inch towards a higher HDI like Kerala. A comparison of Maharashtra with other leading Indian states reveals that the State ranks amongst the top ten states in India for most of the social indicators, featuring between rank six to nine for all the indicators (refer to Table 2.6).

**Table 2.6: Basic Indicators of Human Development**

Indicator	Reference Year	Maharashtra	State Rank	India	Rank 1 State
Literacy - Male (%)	2011	88.38	7	82.14	Kerala (96.11)
Literacy - Female (%)	2011	75.87	8	65.46	Kerala (92.07)
Literacy - Total (%)	2011	82.34	7	74.04	Kerala (94)
Life expectancy at birth - Male (years)	2016-20	69.9	6	66.9	Kerala (74.2)
Life expectancy at birth - Female (years)	2016-20	73.7	5	69.9	Kerala (78.1)
Birth rate	2015	16.3	8	20.8	Goa (12.7)
Death rate	2015	5.8	8	6.5	Nagaland (3)
Infant mortality rate	2015	21	6	37	Manipur (9)
Percapita income at current prices in ₹	2015-16	147399	8	1,03,219	Goa (299003)
Human Development Index	2007-08	0.572	6	0.467	Kerala (0.79)

Source: Maharashtra State Data Bank (n.d.) and India Human Development Report 2011

**Figure 2.4: Rank of Maharashtra for Select Indicators**

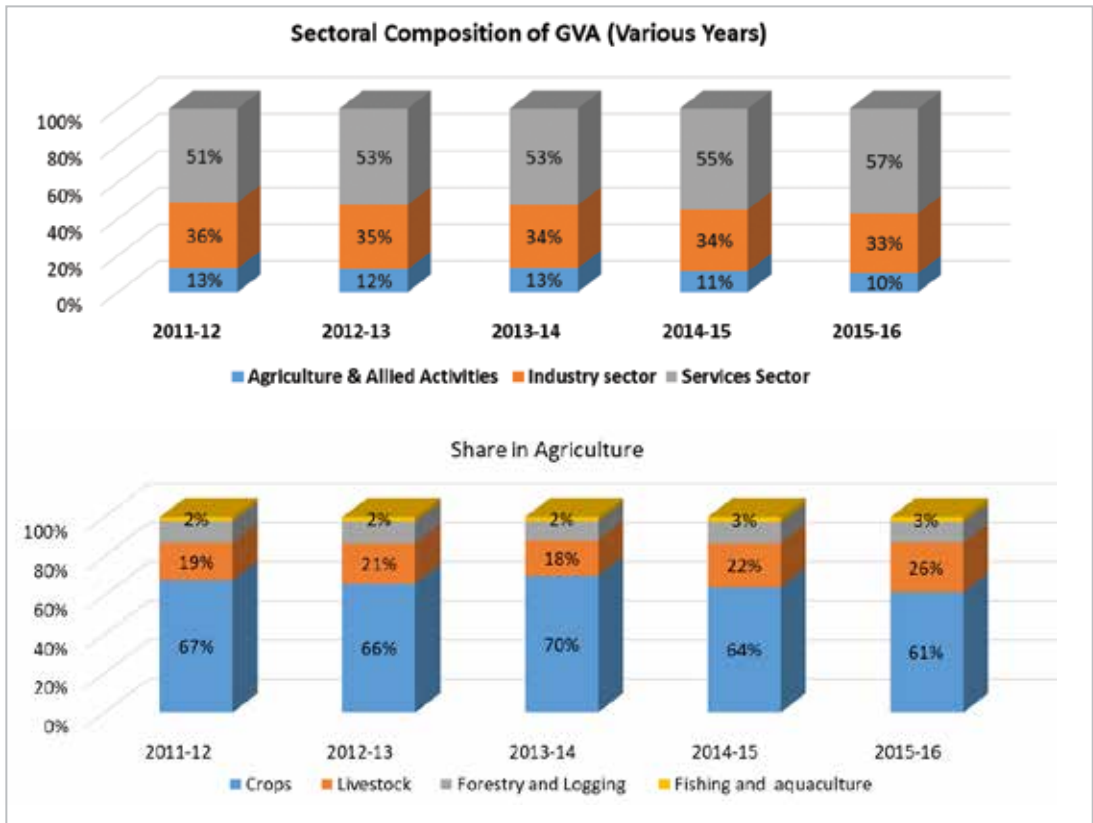
Source: Maharashtra State Data Bank (n.d.)

Mumbai comprising Mumbai district and suburban district taken together has the highest HDI of 0.841 whereas the tribal dominated Nandurbar in north Maharashtra has the lowest HDI of 0.604. The ten districts with low HDI include: Nandurbar (0.604), Gadchiroli (0.608), Washim (0.646), Hingoli (0.648), Osmanabad (0.649), Jalna (0.663), Beed (0.678), Parbhani (0.683), Buldhana (0.684) and Yavatmal (0.700). These districts with low incomes have different problems. The farm crisis and poor infrastructure are two common issues in all these districts (YASHADA, 2014). Having said this, it may also be indicated that the poverty level in Maharashtra has reduced from 49% in 1993 to 17% in 2012. Literacy rate has improved from 65% in 1991 to 82% in 2011. The enrolment in secondary and higher secondary education has improved from 71% to 87% in 2015 and in higher education this figure has risen from 20% to 31% (Maharashtra State Data Bank, n.d.).

## 2.6 Agriculture & Allied Sectors

Maharashtra witnessed a deficit monsoon for the last couple of years and it was only during 2016-17, there was satisfactory rain. This helped the State to register the growth rate of the real Gross State Value Added (GSVA) of Agriculture & Allied Activities to 10% (Figure 2.5).

**Figure 2.5: Sectoral Composition of GVA (Various Years)**



Source: Authors calculation based on data from Economic Survey of Maharashtra, various years.

Needless to mention that, Agriculture & Allied Activities sector is the primary constituent of the economy of Maharashtra with respect to employment, as per Census 2011, out of the 4.94 crore total workforce, about 23.2% workers in the State are cultivators and another 22.9% are agricultural laborers (GoM, 2018). It is, therefore, necessary to accelerate growth in the Agriculture & Allied Activities sector, enhancing the incomes of the farmers ensuring income security. The index number of agricultural production (Base: Triennial 1979-82) for the State compiled by the Commissionerate of Agriculture, Government of Maharashtra, is given in Table 2.7, providing a clear picture of the agricultural production in Maharashtra.

**Table 2.7: Index Number of Agricultural Production Base: Triennial (1979-82)**

Crop Group	Weight (%)	Index		% Change
		2014-15	2015-16	
Cereals	42.22	98.51	73.13	(-)25.8
Pulses	10.44	144.57	131.32	(-) 9.2
<b>Total food grains</b>	<b>52.66</b>	<b>107.64</b>	<b>84.67</b>	<b>(-) 21.3</b>
Oilseeds	9.16	56.12	49.97	(-) 11.0
Fibres	9.93	244.24	244.24	0
Misc	28.25	317.25	239.96	(-) 24.4
<b>Total non-foodgrains</b>	<b>47.34</b>	<b>251.41</b>	<b>204.09</b>	<b>(-) 18.8</b>
<b>All</b>	<b>100</b>	<b>175.7</b>	<b>141.2</b>	<b>(-) 19.6</b>

Source: GoM. (2017a, p. 116)

The State has to take several important measures to improve the agriculture related indicators. It is clearly seen that for most of the indicators, Maharashtra lags far behind other states.

**Table 2.8: Agriculture Related Indicators: Rank of Maharashtra Vis-à-vis Leading States**

Indicators	States (All India Rank)	Values
Yield per hectare* - All cereals (kg.)	Maharashtra (30)	1321
	Punjab (1)	4427
Yield per hectare - All pulses (kg.)	Maharashtra (21)	733
	Delhi (1)	1845
Yield per hectare - All food grains (kg.)	Maharashtra (30)	1133
	Punjab (1)	4403
Yield per hectare - All oilseeds (kg.)	Maharashtra (7)	1279
	Goa (1)	2485
Yield per hectare - Cotton (lint) (kg.)	Maharashtra (11)	323
	Punjab (1)	719
Yield per hectare - Sugarcane (Ton) (kg.)	Maharashtra (6)	81
	West Bengal (1)	6
Per capita food grains production (kg.) (2013-14)	Maharashtra (24)	118.8
	Punjab (1)	1036.1

Indicators	States (All India Rank)	Values
Consumption of fertilizers per hectare cropped area (kg.) (2013-14)	Maharashtra (13)	119.4
	Andhra Pradesh (1)	219
Net area sown per cultivator (Hectare) (2013-14)	Maharashtra (8)	1.4
	Goa (1)	4.1
Net area sown to total geographical area (%) (2013-14)	Maharashtra (5)	56.4
	Punjab (1)	82.3
Cropping Intensity (2013-14)	Maharashtra (14)	134.3
	Sikkim (1)	190.5
Forest cover to total geographical area (%) (2015)	Maharashtra (20)	16.5
	Mizoram (1)	88.9
Tree cover to total geographical area (%) (2015)	Maharashtra (8)	3.1
	Goa (1)	8.8

Source: Maharashtra State Data Bank (n.d.)

Note: Yield Per Hectare are Triennial Averages for 2011-12 to 2013-14

It is well noted in several academic papers / research papers that agriculture and allied activities could not perform well in the state of Maharashtra due to lack of proper and timely credit facilities. To facilitate better credit availability to farmers, RBI has adopted 'Service Area Approach' for making credit available in every village with district as the unit of service area. Accordingly, annual credit plan of the State is prepared and monitored by the convener bank, wherein the designated bank appointed is the Bank of Maharashtra of State Level Bankers Committee (SLBC)<sup>1</sup>. Annual credit plan size for priority sector of the State for 2016-17 is ₹2.55 lakh crore. In this plan, the share of 'Agriculture & Allied Activities' is 30% while that of Rural artisans, village & cottage industries and Small Scale Industries sector is 63%. Simultaneously, the Government of India has set up Rural Infrastructure Development Fund (RIDF) in 1995-96 for financing ongoing rural infrastructure projects at low cost to the State Governments. The fund is managed by NABARD. At present, for Agriculture & Allied Activities sector, social sector and rural connectivity, the loans are provided up to 95%, 85% and 80% of the project cost respectively. Under this, 34 activities are covered, up to March 2016, XXI tranches have been launched, and an amount of ₹8,125 crore has been disbursed to the State (For details refer to Section 2.7.2). The whole aim is doubling of the farmers' incomes by 2022.

<sup>1</sup> For details refer to : <https://www.bankofmaharashtra.in/SLBC.asp>



## 2.7 Rural Maharashtra: A Brief Profile

According to Census of India 2011, 68.86% of the population of Maharashtra lives in rural areas. Therefore, any situational change in the rural areas is bound to have a multiplier effect on the entire economy. Some important characteristics of rural households in Maharashtra in comparison to India are provided in Table 2.9.

**Table 2.9: Select Characteristics of Rural Households: Maharashtra Vis-à-vis India (in %)**

Item	Maharashtra			India		
	Total	SC	ST	Total	SC	ST
Motorised two/three/four wheeler/ fishing boat	21.73	1.49	0.84	20.71	2.33	1.09
Mechanised three/four wheeler agricultural equipment	2.7	0.1	0.11	4.1	0.36	0.18
Kisan credit card with credit limit of ₹ 50,000 and above	2.8	0.12	0.11	3.61	0.32	0.18
Any member as a Government employee	5.49	0.69	0.45	4.98	0.73	0.48
Non-agricultural enterprises registered with the Government	2.62	0.22	0.14	2.73	0.36	0.23
Any member earning more than ₹ 10,000 per month	10.85	0.88	0.57	8.25	0.86	0.49
Any member paying income tax/ profession tax	5.59	0.59	0.35	4.57	0.64	0.37
Three or more rooms with all rooms having pucca walls and roof	16.77	1.27	0.69	18.45	2.08	0.7
Ownership of 2.5 acres or more of irrigated land with at least one irrigation equipment	5.99	0.16	0.18	4.25	0.24	0.19
Five acres or more of irrigated land for two or more crop seasons	3.68	0.08	0.11	3	0.16	0.14
Ownership of at least 7.5 acres of land or more with at least one irrigation equipment	3.74	0.08	0.1	2.26	0.09	0.1
Without shelter	0.21	0.04	0.06	0.07	0.02	0.02
With destitute/ living on alms	0.2	0.03	0.02	0.31	0.07	0.02
With manual scavengers	0.3	0.04	0.04	0.04	0.01	0.01
With primitive tribal groups	0.94	0.01	0.89	0.45	0.01	0.4
With legally released bonded labourers	0.09	0.01	0.02	0.04	0.01	0.01
Only one room, kuccha walls and kuccha roof	8.03	1.26	2.66	13.28	3.18	2.43
No adult member between the ages of 16 to 59 years	5.09	0.85	0.58	3.64	0.77	0.41

Item	Maharashtra			India		
	Total	SC	ST	Total	SC	ST
Proportion of households having						
Female headed households with no other adult male member between 16 to 59 years	4.83	0.77	0.59	3.86	0.8	0.52
Disabled member and no able bodied adult member	0.35	0.07	0.04	0.4	0.08	0.05
SC/ST households	19.54	9.14	10.3	21.56	13.2	8.18
No literate adult above 25 years	17.57	2.65	5.1	23.52	5.75	4.32
Landless households deriving a major part of their income from manual casual labour	29.57	6.17	6.4	30.04	8.33	3.28

Source: Socio Economic and Caste Census 2011.

In Maharashtra, several schemes/initiatives have been launched by the Government of Maharashtra to work towards socio-economic empowerment of the rural households. Some of them, compiled from Economic Survey of Maharashtra 2017-18, are highlighted below.

- The National Food Security Act 2013 (NFSA) is being implemented in the State since February 1, 2014. Under NFSA, around seven crore (62.3%) population in the State is entitled to get food-grains at subsidized rates. This covers about 4.70 crore population in rural areas.
- As on March 31, 2016, there are 11,789 Scheduled Commercial Banks' (SCBs) banking offices (which are about 9% of the total banking offices in India) operational in Maharashtra and about 27% of these are located in rural areas.
- To ensure financial inclusion, under the Pradhan Mantri Jan-Dhan Yojana (PMJDY), till February 2017, around 1.76 crore accounts have been opened in the State, of which about 50% (87.11 lakh) accounts are from rural areas.
- Government of Maharashtra has launched an ambitious scheme of farm ponds i.e. Magel Tyala Shet Tale Yojana for farmers in the State. Under Magel Tyala Shet Tale Yojana, it is targeted to create 1,11,111 farm ponds in 2016-17 for better water availability for agriculture.
- The Maharashtra State Co-operative Bank (MSCB) and Regional Rural Banks (RRBs) have issued 2.37 lakh and 0.75 lakh new Kisan Credit Cards (KCC) respectively in the State during 2015-16.
- Under the Sant Tukaram Vangram Yojana, a total of 12,517 Joint Forest Management Committees (JFMC) with nearly 29.70 lakh members were constituted in 15,500 villages.
- The 'Retail Trade Policy 2016' for the Government of Maharashtra clearly acknowledged

that to create more employment opportunities, to educate the youth of all sections of the society across the region especially in rural areas, they must take part in retail trade.

- Under the aegis of the Deen Dayal Upadhyay Gram Jyoti Yojana, the Government of Maharashtra proposed to provide electricity connection to 12.48 lakh rural households (including 3.96 lakh BPL households).
- The State government has proposed to construct 24,439 km of road length for connecting 8,315 habitations in the State under the Pradhan Mantri Gram Sadak Yojana (PMGSY). With the said target, up to November 2016, road length of 23,198 km has been created by connecting 8,218 habitations.
- Similarly, under the Chief Minister Gramsadak Yojana, a physical target of 7,200 km of village roads is set during 2015-16 and 2016-17. Under this scheme, total of ₹ 221.10 crore is spent on the works.
- Some of the key financial indicators for the State of Maharashtra are provided below (Table 2.10) as a ready reference.

**Table 2.10: Key Financial Indicators: Maharashtra Vis-à-vis other States**

Indicator	Reference Year	Maharashtra	State Rank	Rank 1 State
Number of banking offices per lakh population	31-3-2016	9.8	18	Goa (33.3)
Per capita deposits (₹)	31-3-2016	181351	3	Delhi (458617)
Per capita credit (₹)	31-3-2016	186158	2	Delhi (456000)
Credit -Deposit Ratio (%)	31-3-2016	102.7	3	Tamil Nadu (112.9)
Share of priority sector advances in total credit of scheduled commercial banks (%)	31-3-2016	25.7	27	Andhra Pradesh (122.3)

Source: GoM (2017a)

According to data reported by NITI Aayog, as on April 30, 2017, total number of Infrastructure Projects taken by the Centre for Maharashtra is 1097. Total number of projects include Public-Private Partnership (PPP) projects, traditional government projects and private projects. Total cost incurred is ₹ 597319.13 crore which accounts to 11.8% of total infrastructure development fund delivered to all states, by the centre.

## 2.7.1 Rural Infrastructure Development Fund (RIDF)

The RIDF was set up by the Central Government in 1995-96 for financing ongoing rural infrastructure projects. The fund is maintained by the National Bank for Agriculture and Rural Development (NABARD). Domestic commercial banks contribute to the Fund to the extent of their shortfall in stipulated priority sector lending to agriculture. The main objective of the Fund is to provide loans to the State Governments and State-owned Corporations to enable them to complete ongoing rural infrastructure projects. As part of infrastructure funding, NABARD had launched a scheme Rural Infrastructure Development Fund (RIDF) in 1995-96 with an initial corpus of ₹2,000 crore for the country as a whole. The allocation in 2017-18 has reached to ₹25,000 crore. The eligible activities under RIDF can be broadly classified into agriculture and related sector, social sector, and rural connectivity. The initial mobilization advance was released at 30% for North Eastern and Hilly States and 20% for the other States<sup>2</sup>. These projects could take up a loan up to 85-90% of the cost of the project at the interest rate prevailing at that point of time. Through this scheme, it ensured a committed supply of funds for sanctioned projects, so that the state governments are able to take up the implementation efficiently. Financing of incomplete projects has been taken care of. This has also led to the creation of additional irrigation potential and creation of jobs and thus, has contributed to the economic prosperity in the rural areas. A special window known as Rural Infrastructure Promotion Fund (RIPF) has been created under RIDF for funding the rural roads component of Bharat Nirman through National Rural Roads Development Agency (NRRDA) for supporting programs and activities that promote rural infrastructure, with the ultimate objective of facilitating agriculture and rural development. The evaluation studies of RIDF have shown that this scheme has become a popular funding mechanism for state governments and supported the building of rural India by funding critical rural infrastructure projects. There has been a positive impact on rural income levels, diversified livelihood activities and improved quality of life as also positive effect on rural banking business. As per Nabard annual report 2017-18 and the economic surveys of the Government of Maharashtra (various years) the total amount of RIDF (total of all Tranches) sanctioned is ₹307609.55 crore, delivered ₹224082.88 crore and 72.85% of the amount has been utilised for all the states. For Maharashtra specifically, ₹14914.52 crore fund has been sanctioned and ₹11090.46 crore amount has been delivered on account of RIDF. Data reports that 74.23% of the amount has been utilized by the State. Table 2.11 portrays tranche-wise number of projects sanctioned and the total amount of fund disbursed in the accounts of the projects for the State from the beginning to till date.

<sup>2</sup> Refer to the Annual Report 2017-18 of NABARD, [https://www.nabard.org/auth/writereaddata/tender/0908181051NABARD-AR\\_2017-18%20English.pdf](https://www.nabard.org/auth/writereaddata/tender/0908181051NABARD-AR_2017-18%20English.pdf)

**Table 2.11: Projects Sanctioned and Loans Disbursed under RIDF for Maharashtra**

Tranche	Year	Projects Sanctioned (no.)	Fund Disbursed (₹Crore)
I- XIV	1995-2009	9,926	5,087
XV-XX	2010-2015	10,244	4,627
XXI	2015-2016	776	494
XXII	2016-2017	171	288

Source: NABARD Annual Reports, various years and GoM (2018)

For Maharashtra, for all closed tranches since first to sixteenth, total amount sanctioned is ₹7680 crore which counts 88% of utilization. Table 2.12 shows tranche-wise cumulative fund sanctioned and utilization for the State in comparison with all India. This fund specification includes both – fund delivered on RIDF and fund delivered on Bharat Nirman. At present, 36 activities are covered under broad categories of Agriculture & Allied Activities as well as Social and Rural Connectivity sector and the loans are provided up to 95%, 85% and 80% of the project cost respectively. Up to March 31, 2018, XXIII tranches have been launched and an amount of 10,496 crore has been disbursed for the State. Projects sanctioned and loans disbursed under RIDF are given in Table 2.11.

**Table 2.12: Tranche-wise Total Cumulative Sanctions and Disbursements as on 31.03.2018**

Maharashtra Grand Total (India) [RIDF+ Bharat Niman]	Maharashtra			Grand Total (India)		
	Amount Sanctioned [₹ Crore]	Amount Disbursed [₹ Crore]	Utilisation in %	Amount Sanctioned [₹ Crore]	Amount Disbursed [₹ Crore]	Utilisation in %
Total of all Closed Tranches [I- XVI]	7680.23	6759.51	88.01	139336.80	124417.90	89.29
Total of all On-going Tranches [XVII-XXIII]	6612.01	3995.65	60.43	171184.73	113520.60	66.31
Warehousing Tranches (XVII- XVIII)	459.93	297.20	64.62	3354.32	2657.78	79.23
Total of all Tranches	14752.17	11052.36	74.92	313875.85	240596.30	76.65

Source: NABARD, <https://www.nabard.org/auth/writereaddata/File/ANNEXURE%20I.pdf>

Specifically, Maharashtra has utilized RIDF fund on an average more than 65% of fund sanctioned which is almost similar to India as a whole. Table 2.13 provides the bifurcated distribution of tranche-wise cumulative sanctions and disbursements for RIDF for Maharashtra and for India, as per latest data reported by NABARD.

**Table 2.13: Tranche-wise Cumulative Sanctions and Disbursements for RIDF as on 31.03.2018**

	RIDF (Maharashtra)			RIDF (India)		
	Amount Sanctioned [₹ Crore]	Amount Disbursed [₹ Crore]	Utilisation in %	Amount Sanctioned [₹ Crore]	Amount Disbursed [₹ Crore]	Utilisation in %
Tranche - XVII	1219.5	779.43	63.91	18741.76	15901.78	84.85
Tranche - XVIII	559.7	503.38	89.94	18247.95	15917.93	87.23
Tranche -XIX	648.56	449	69.23	22616.39	18903.61	83.58
Tranche - XX	1321.63	1002.75	75.87	28448.13	21216.6	74.58
Tranche - XXI	869.29	650.73	74.86	28828.91	20036.7	69.5
Tranche - XXII	999.99	395.75	39.58	27119.73	13510.79	49.82
Tranche -XXIII	993.34	214.62	21.61	27181.86	8033.19	29.55

Source: NABARD, <https://www.nabard.org/auth/writereaddata/File/ANNEXURE%20I.pdf>

### 2.7.2: Rural Infrastructure Promotion Fund (RIPF)

'Rural Infrastructure Promotion Fund' (RIPF) is a Special Fund created by NABARD to support programs and activities that promote rural infrastructure, with the ultimate objective of facilitating agriculture and rural development. The objectives of RIPF are:

- to support the activities required to support the promotional efforts of RIDF;
- to conduct knowledge sharing workshops, national/ international exposure visits for senior level bank/State functionaries, exchange of technical experts, etc.;
- for survey of potential assessment/ demand survey for new agri/rural infrastructure projects;
- to create experimental infrastructure projects by Gram Panchayats (GPs), Self Help Groups (SHGs)/SHG Federations, Farmers' Clubs (FC)/ Farmers Clubs Federations and NGOs and villages under Village Development Plans (VDPs).

### 2.7.3: NABARD Infrastructure Development Assistance (NIDA)

NIDA is a new line of credit support for funding rural infrastructure projects for state governments and other state-owned organizations. For state governments, NIDA offers assistance for rural infrastructure development, outside of RIDF borrowing. For other state-owned organizations, NIDA provides direct financing based upon risk appraisal of every specific project.

## 2.8 Conclusion

The process of agricultural development in Maharashtra over the last three decades indicates regional inequality in which Western Maharashtra remained much ahead of other regions in terms of major development indicators. This has been well brought out in a report by Apte, Bodhke and Dhume (2015); Kalamkar (2011); Mohanty (2009); and Suryanarayana (2009). Shroff, Kajale and Bodhke (2015) indicate that Maharashtra is a high cost state, which makes agriculture economically unviable. They suggest that in order to prevent agrarian distress, productivity levels of all crops have to rise for which strengthening of input supply, irrigation, competition in marketing, and sound infrastructure are required. Realizing the need of balanced regional development for Maharashtra, a High Level Committee headed by Dr. Vijay Kelkar had been set up in 2013 to bring out intricacies of the issues involved. The report (cited as GoM, 2013) proposed number of reforms to be taken up through a multi-dimensional approach to achieve the balanced regional development on a sustainable basis. Some important recommendations were on governance reforms aimed at greater empowerment and accountability at regional level, institutional reforms towards capacity building for efficient use of public sector resources, encouragement by state government for group marketing efforts of the farmers and removal of restrictions on marketing by themselves. Further, the report has focused on encouraging participation of farmers in futures market, whereby the state government can strengthen warehouse receipt based bank credit and partial guarantee for the hypothecated produce and supportive policy initiatives to safeguard the interests of farmers from fluctuating prices of commodities through Agriculture Produce and Market Committee's (APMC) effective checks for commodity losses and fair dealings by commission agents.

In a broader sense, the state of Maharashtra needs supportive policy reforms, which would link regional empowerment with accountability, considering regional aspirations. However, a speedy development of any backward region is a complex process and depends on a number of factors. In order to get the reformation of the whole system through proper implementation of the aforementioned recommendations, it is imperative to have proper understanding of factors such as geography of a region, physical resource endowment, physical infrastructure, mobilization of social capital, supportive policies, social infrastructure, institutional capacity, etc. Poor rural infrastructure is the key element for regional imbalance and is the one of the critical barriers for inclusive rural development. It is difficult to implement any corrective measures for eradication of chronic poverty and regional inequality that exists in the State, unless we have proper infrastructure to adopt the reforms. Further, it is important to get a bird's eye view of the district-wise detailed infrastructure development which will help create a proper road map to strive towards inclusive rural development. A comprehensive exercise should be undertaken for district-wise ranking of the multi-dimensional rural infrastructure development.





# Rural Development Infrastructure Index

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## Chapter-3

### Data and Methodology

## 3.1 Introduction

The rural infrastructure index has been constructed for 33 districts and 8 divisions of Maharashtra using Principal Component Methods. The infrastructure indices for three dimensions viz. Physical, Social and Institutional, have been constructed using 28 parameters. Physical infrastructure index uses 12 parameters, while Social and Institutional Indices use 8 each respectively.

The study excludes three districts viz. Mumbai, Mumbai Suburban and Palghar. Mumbai and Mumbai Suburban have been excluded as they are purely urban districts and Palghar is excluded because it was created in 2014 from Thane district as the 36th district of the State, and the data for most of the variables is not available for Palghar.

### 3.1.1 Parameter Selection for Infrastructure Index

The parameters used for developing the rural infrastructure index for Physical, Social and Institutional dimensions are listed in the Tables 3.1, 3.2 and 3.3.

## 3.2 Parameter/Variable Normalization

It is quite clear that all these parameters are inter-related and play an important role in delivering and performing the developmental activities in rural economy. Additionally, there are wide inter-district disparities in terms of availability of these parameters either due to the differences in physical areas of the districts or due to differences in population sizes of the districts. So, proper standardization is required to make them comparable. For example, total pumpset availability in Nandurbar district is 8648 whereas for Satara district it is 431298. The geographical areas for Nandurbar and Satara are 5902.48 sq. km. and 10054.49 sq. km. respectively. So, in order to capture the actual realisation of the number of pumpsets, it will be logical if it is normalised with respect to some common norms. Literature suggests a variety of measures for such normalisation, such as, Gross Cropped Area, Net Cropped Area, Total Geographical Area, Total Population, etc. However, in this case, GCA is more appropriate as it measures the actual utilisation of cultivable land. More the land is used for multiple cropping, the more will be GCA and hence more will be the requirement for infrastructure such as power, machinery, credit, warehouse capacity, marketing channels, etc. Thus, in order to capture the requirement/gap of infrastructure, these parameters should have been normalised with respect to GCA. Similarly, the parameters for social and institutional dimensions have also been normalised with respect to either population or area as and when required.

Table 3.1 Parameters for Physical Infrastructure Index

Parameter	Variable Name	Detailed description	Reference Year	Source
LAND UTILISATION	Cropping Intensity (CI)	Measures the effectiveness of land use. It is given by the formula $CI = \frac{\text{Gross Cropped Area (GCA)}}{\text{Net Cropped Area (NCA)}} \times 100$	2015	Land Utilisation Statistics
IRRIGATION	Number of Pumpsets per Thousand Hectares of GCA (Pump)	Measures the status of irrigation facilities for farming as well as the status of farm mechanisation and is normalised with respect to Gross Cropped Area for making it comparable across the districts of the State	2011	Agricultural Census
	Irrigation Potential Realised (IPR)	It measures the achievement of districts in terms of creation of new potential for irrigation and the achievements thereof. It is calculated in terms of percentage form as: <i>Potential realised</i> $= \frac{\text{Actual achievement (measured in 000 hectare)}}{\text{Potential created (measured in 000 hectare)}} \times 100$	2015	Infrastructure Statistics of Maharashtra
	Pumpsets Energised (PUMPER)	It measures the impact of efficient use of energy in the agricultural sector. For making the variable comparable across the districts, it is being normalised with respect to GCA ('000 hectares) and expressed as: $\text{Pumpsets Energised} = \frac{\text{Total pumpsets energised (in absolute number)}}{\text{Gross Cropped Area}}$	2017-18	Mahavitaran

Parameter	Variable Name	Detailed description	Reference Year	Source
ELECTRICITY	Power Consumption in Agriculture (PCAg)	It is measured by per capita electricity consumption in agriculture and measured in kWh per year.	2015	Infrastructure Statistics of Maharashtra
	Rural Electrification (RE)	It is measured by the percentage of households electrified out of the total Census households at the district level. <i>Households electrified</i> $= \frac{\text{Total households electrified (in absolute number)}}{\text{Total households (in absolute number)}} \times 100$	2011	Census
TRANSPORT	Tractors (TRC)	It measures the status of farm mechanisation along with the agricultural pumpsets. It is expressed as the total number of tractors registered per ('000) hectares of GCA. $\text{Tractors} = \frac{\text{Total tractors registered (in absolute number)}}{\text{Gross Cropped Area}}$	2015	Infrastructure Statistics of Maharashtra
	Road Connectivity (RC)	It measures the communication status at the village level. It is measured by total rural road per sq. km. of rural area. $\text{Rural Road Density} = \frac{\text{Total Rural Roads (in km.)}}{\text{Total Rural Area (in sq. km.)}}$	2011	Infrastructure Statistics of Maharashtra
COMMUNICATION	Mobile Connectivity, (MOBC)	The mobile connectivity is taken into consideration as it enables the farmers to receive real time price information which is crucial for commercial cash crops. The communication penetration is measured as the number of households out of total households having access to mobile connections and expressed in percentage form.	2011	Census

Parameter	Variable Name	Detailed description	Reference Year	Source
STORAGE	Warehouse Facility (WHF)	<p>The total storage and warehouse facility available. It is also normalised with respect to per thousand hectares of GCA to make it comparable across the districts.</p> $\text{Warehouse} = \frac{\text{Total warehouse capacity (in metric tons)}}{\text{Gross Cropped Area}}$	2017	Maharashtra State Agriculture Marketing Board (MSAMB)
AGRICULTURAL MARKETING	Wholesale Market (WSM)	<p>The access to market is very crucial for farmers to market their produce at reasonable market price. For this, the number of wholesale markets per lakh hectares of GCA area has been considered.</p>	2017-18	MSAMB
AGRICULTURAL TECHNOLOGY	Agricultural Laboratory (Agl)	<p>Modern farming techniques require high doses of chemical fertilisers, which necessitates testing of soil regularly as to maintain the efficient use of fertilisers. The available number of soil testing laboratories is normalised with respect to per lakh hectares of GCA to make comparable for all districts.</p> $\text{Soil Testing Labs} = \frac{\text{Total soil testing labs (in absolute number)}}{\text{Gross Cropped Area}} \times 100000$	2017-18	Commissionerate of Agriculture, Maharashtra

Source: Authors' compilation from various sources

Table 3.2 Parameter Selection for Social Infrastructure Index

Parameter	Variable Name	Detailed description	Reference Year	Source
EDUCATION	Rural Literacy Rate (RLR)	Total rural literate population out of the total Census rural population $\text{Rural Literacy Rate} = \frac{\text{Total rural literate population}}{\text{Total rural population}} \times 100$	2011	Statistical Abstract of Maharashtra
	School Density Per 1000 children (SD)	It is measured as a ratio of total schools to thousand children population in the age group of 6-13 $\text{School Density} = \frac{\text{Total Schools}}{1000 \text{ children population in the age group 6 - 13 years}}$	2015-16	Unified District Information System for Education (U-DISE)
	Schools with more than Single Teacher (SST)	It is percentage of schools with more than single teacher $\text{SST} = \frac{\text{Number of schools with more than single teacher}}{\text{Total number of schools}}$	2015-16	U-DISE
AMENITIES	Households with Drinking Water Facilities (HDWF)	It is percentage households with drinking water facilities within premises of the total Census households. $\text{Households with drinking water facilities} = \frac{\text{Number of rural households with drinking water facilities}}{\text{Number of total rural households}} \times 100$	2011	Census
	Households with Latrine facilities (HLF)	It is percentage of households with latrine facilities of the total Census households. $\text{Household with latrine facilities} = \frac{\text{Number of rural households with latrine facilities}}{\text{Total number of rural households}} \times 100$	2011	Census

Parameter	Variable Name	Detailed description	Reference Year	Source
HEALTH	Hospitals Density (HD)	It is the ratio of total rural hospitals to per lakh rural population. $\text{Hospitals} = \frac{\text{Number of hospitals (PHCs + PHUs)}}{\text{Rural population}} \times 100000$	2014-15	Infrastructure Statistics of Maharashtra
	Beds per (000) persons (BED)	It is the ratio of total beds available in rural hospitals to thousand rural population. $\text{Beds} = \frac{\text{Total beds in rural hospitals}}{1000 \text{ rural population}}$	2014-15	Infrastructure Statistics of Maharashtra
	Institutional Deliveries (ID)	It is number of child birth deliveries supported by medical equipments under the supervision of skilled medical staff to number of total deliveries $\text{Institutional Deliveries} = \frac{\text{No of deliveries supported by medical equipment under the supervision of trained medical staff}}{\text{Number of total deliveries}}$	2011	Census

Source: Authors' compilation from various sources

Table 3.3 Parameters Selection for Institutional Infrastructure Index

Parameter	Variable Name	Detailed description	Reference Year	Source
FINANCE	Households with Banking Facility (HBF)	It is percentage of households with banking facilities of the total Census households. $\text{Households with banking facility} = \frac{\text{Number of rural households with banking facility}}{\text{Number of total rural households}}$	2011	Census
	Banks (BANK)	It is number of banks to per lakh population population. $\text{Bank} = \frac{\text{Total number of banks}}{\text{Rural population (in lakhs)}}$	2017-18	Bank of Maharashtra
AGRICULTURAL EXTENSION	Primary Agricultural Cooperatives societies (PACs)	It is number of PACs to per lakh rural population. $\text{PACs} = \frac{\text{Total number of PACs}}{\text{Rural Population (in lakhs)}}$	2016-17	Office of Commissioner for Co-operation and Registrar, Co-operative Societies, GoM
	Credit (CREDIT)	It is measured as the ratio of sum of ground level credit outlets, agri business clinics and farmer producers companies for per lakh rural population	2017	Bank of Maharashtra
	Self-help Groups (SHGs)	It is number of SHGs for per lakh rural population $\text{SHGs} = \frac{\text{Total number of SHGs}}{\text{Rural Population (in lakhs)}}$	2017	National Rural Livelihood Mission
	Extension Capacity (EXTCAP)	It is measured as total agricultural extension staff to the Gross Cropped Area $\text{Extension capacity} = \frac{\text{Total agricultural extension staff}}{\text{Gross cropped area (in lakh hectares)}}$	2017	Department of Establishments, Commissionerate of Agriculture



Parameter	Variable Name	Detailed description	Reference Year	Source
INSTITUTIONAL CAPACITY	Post Offices (PO)	It is number of rural post office branches for per lakh rural population  $\text{Post Offices} = \frac{\text{Total number of rural post offices}}{\text{Rural population (in lakhs)}}$	2014-15	Infrastructural Statistics of Maharashtra
	Insurance (INS)	Insurance is measured as percentage of crop insurance coverage to Gross Cropped Area  $\text{Insurance} = \frac{\text{Crop Insurance Coverage (hectares)}}{\text{Gross Cropped Area (in hectares)}} * 100$	2016-17	Department of Agriculture, Govt. of Maharashtra

Source: Authors' compilation from various sources

### 3.3 Scaling Down of Parameters/Variables

After this normalization of the parameters, it is seen that there are wide differences in the values of the parameters and they are measured in different units of measurements. So, for the ease of computation, all the parameters have been scaled down as well made unit free by using the following formula:

$$X_{scaled\ down} = \frac{X - \min^*(X)}{\max(X) - \min^*(X)}$$

Where X = observed value for any parameter across the districts

$\min^*(X) < \min(X)$ , that is,  $\min^*$  is less than the minimum value of the parameters across districts (simply to avoid zeros in scaling down), and

$\max(X)$  is the maximum value of the parameter across the districts.

### 3.4 Composite Index of Physical Infrastructure

Principal Component Methods have been applied to the scaled down variables and the number of components having Eigen values greater than unity have been retained for constructing the infrastructure index.

Kaiser-Meyer-Oklain statistic (KMO statistic) and Bartlett's Test of Sphericity have been used to check the sample adequacy and goodness of fit in the Principal Component Method.

Once the Principal Components have been identified using the Eigen value criterion, the factor loadings are multiplied with the corresponding values of the variables (scaled down values) and summed up to produce the Infrastructure Index. In case, if multiple Principal Components are retained on the basis of Eigen value, the average value will provide the Infrastructure Index.

$$PC_i = \sum_i \sum_j W_{ij} X_{ij}$$

$i = 1, 2, \dots, \dots, \text{Number of component retained}$   
 $j = \text{Parameters } (1, 2, \dots, 28)$

Depending on the criteria of Eigen values, a number of components will be retained and after calculating scores of each component for each district, they will be averaged with equal weightage to produce the composite index of each districts.

$$Index = \frac{\sum_i PC_i}{\text{Number of components}}$$

$i = 1, 2, \dots, \text{Number of components}$

Finally, the districts are ranked on the basis of the final composite index for all the three dimensions.

### 3.5 Inter-Divisions Comparison by Analysis of Variance (ANOVA)

There are eight agricultural divisions in Maharashtra viz. (Konkan, Nasik, Pune, Kolhapur, Aurangabad, Latur, Amravati and Nagpur) and each of the divisions includes a number of districts with different varying infrastructural facilities. In order to make inter-division comparison, one-way ANOVA with Tukey post-hoc analysis has been applied. This will enable us to find out the relative performance of the eight agricultural divisions of the state vis-à-vis rural infrastructure index.



# Rural Development Infrastructure Index

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## Chapter-4

### Physical Infrastructure Index

## 4.1 Introduction

Physical infrastructure in a rural economy broadly covers power, communication, irrigation, transportation, market, machineries for farming and their forward as well as backward linkages. All these factors are not conducive for private sector investment into infrastructure. Further, there are many attributes of infrastructure that make it difficult for individuals to design, construct, operate and maintain these services effectively and efficiently. As a result, infrastructure services the world over, are largely provided by the public sector. Thus, there are often good reasons for public sector involvement in the provision of rural infrastructure services, however, in the production of such services, there exists a role for other than public sector entities too (Ostrom et al., 1993).

Infrastructure is an umbrella term for many activities referred to as social overhead capital by development economists such as Lewis (1955), Rosenstein-Rodan (1943), Hirschman (1958). Lewis (1955) included public utilities, ports, water supply and electricity as infrastructure, whereas Hirschman (1958) outlined four conditions that characterize infrastructure or social overhead capital: such services are provided to facilitate or are basic to economic activity; they are usually public goods because of economic externalities; cannot be imported; and involve investments that are indivisible or 'lumpy'. Later, in the sixties, besides the above, emphasis was laid on agricultural research, extension and rural financial institutions as important elements of infrastructure, due to increasing recognition of the role of agriculture in economic development and the vital role that infrastructure plays in generating agricultural growth (de Vries, 1960; Ishikawa, 1967). As in rural economy of most of the states in India, the agriculture crop and livestock sectors remain the mainstay of the rural economy. Maharashtra is also no exception as around 46% of the main workers remain engaged directly in agriculture and allied activities; agriculture alone produces 11.40% of state income (GoM, 2018).

Under this backdrop, the umbrella of physical infrastructure for the state of Maharashtra will be measured at the district level with the help of 12 parameters. The main objectives here are as under:

- To compute the physical infrastructure index for all the districts of Maharashtra and rank them;
- To assess the status of rural physical infrastructure in Maharashtra and to see whether there is any pattern of regionalisation in the infrastructural facilities of the districts of the State;
- To understand and identify the kinds of disparities in rural physical infrastructure development across the various districts and divisions of Maharashtra.

## 4.2 Status of Some Select Indicators at National and State Levels

The relative performance of the districts of Maharashtra and the actual values of the parameters taken into final calculation have been reported in the district report cards (given in Appendix B, Tables B1 to B33). However, the comparison of the rankings of the districts with respect to individual parameters will not be able to provide a clear and broad picture of the physical infrastructure of districts of the State, as a district may be performing well in certain component of infrastructure, but may be failing to do well in other areas of infrastructure. The average values of the parameters for the State as a whole, along with the national average and top five performing states (for each category), are produced in Table 4.1.

Table 4.1 clearly indicates that the State lacks, to a great extent, in aspects relating to cropping intensity, pumpsets energized and mobile connectivity. Cropping intensity reflects the status of multiple cropping systems, which in turn, is an outcome of the improvement of area covered under irrigation. The cropping intensity for Maharashtra did not change for a long time and remains stagnant since the last decade of the previous century (Annexure 7.2, GoM, 2018); it is below the national average (141.82). The State is far away from the top performing states (Sikkim, Punjab, Haryana, West Bengal and Himachal Pradesh) in this aspect. Among the eight agricultural divisions in the State, only three divisions (Aurangabad, Latur and Amravati) have cropping intensity above the state average. What is puzzling is that these divisions are in the rain shadow areas of the State as well as drought prone areas.

**Table 4.1: Position of Maharashtra at National Level with Respect to Select Physical Indicators**

Parameter	State Average	National Average	Top Five States (With Values)	
Cropping Intensity (%) (for 2015-16)	133	141.82	Sikkim	190.5
			Punjab	189.3
			Haryana	185.0
			West Bengal	183.3
			Himachal Pradesh	171.4
Rural Electrification (%) (2011 Census)	75	73.8	Goa	95.6
			Punjab	95.5
			Kerala	92.1
			Tamil Nadu	90.8
			Sikkim	90.2

Parameter	State Average	National Average	Top Five States (With Values)	
Power Consumption in Agriculture (for 2013-14)	22297 (GWh) (22.07% of total energy produced)	168913 (GWh) (20.74% of total energy produced)	Rajasthan	40.01%
			Odisha	33.65%
			Haryana	32.25%
			Jammu & Kashmir	29.97%
			Karnataka	27.22%
Road Connectivity (road length in km per sq.km.)	0.49	0.48	Kerala	2.28
			Punjab	1.24
			Goa	0.89
			Tripura	0.72
			Tamil Nadu	0.66
Tractors	2.30	NA	NA	
Pumpsets Energised	16	28.17	NA	
Warehouse Facility (in MT/ha) (for 2016-17)	5.5	9.1	Punjab	23.27
			Haryana	10.01
			Andhra Pradesh	8.42
			Chattisgarh	4.15
			Tamil Nadu	4.13
Mobile Connectivity (%)	43	54.7	Kerala	88.0%
			Goa	84.3%
			Himachal Pradesh	81.0%
			Punjab	79.6%
			Haryana	75.4%

Source: Agriculture Census Division (2016), Census of India 2011, GoM (2017b), Offices of Mahavitaran and MSAMB.

Further looking at the district level information of Maharashtra, the achievements of 33 districts have been compared with the state average as well as national average for some selected parameters in the physical dimension of rural infrastructure. The data has been reported in Table 4.2.



**Table 4.2: Relative Position of Districts in Select Parameters within Maharashtra**

Parameter	State Average	National Average	Number of Districts above State Average	Number of Districts above National Average	Top Performer	Worse Performer	Coefficient of Variation among the Districts
Cropping Intensity (%)	133	141.8	14	7	Osmanabad	Thane	14.95
Number of Pumpsets per Thousand Hectares of GCA	21	NA	11	NA	Satara	Nandurbar	64.51
Irrigation Potential Realised (%)	46	NA	15	NA	Satara	Osmanabad	64.41
Rural Household Electrification (%)	75	73.8	21	21	Dhule	Nandurbar	15.68
Road Connectivity (per sq. km. of rural area)	0.49	0.48	15	16	Sangli	Buldhana	46.37
Number of Tractors per Thousand Hectares of GCA	2.30	NA	14	NA	Nasik	Ratnagiri	71.83
Pumpsets Energised (for '000 Hectares GCA)	16	28.17	15	2	Nasik	Thane	78.56
Warehouse Capacity per Thousand Hectares of GCA	6.18	4.11	7	12	Gondia	Ratnagiri	127.01
Mobile Connectivity (%)	43	54.7	17	5	Pune	Nandurbar	27.14
Number of Wholesale Markets per Lakh Hectares of GCA	0.15	NA	14	NA	Raigad	Ratnagiri	52.07

Source: Agriculture Census Division (2016), Census of India 2011, GoM (2017b), Offices of Mahavitaran and MSAMB.

The average cropping intensity in the State is about 133 %. Out of eight divisions, five divisions have lower average than the state average. Only two divisions, viz. Aurangabad and Latur have cropping intensity higher than the state average.

**Table 4.3: Cropping Intensity (CI) of Different Divisions, Maharashtra**

Divisions	Total Districts	Cropping Intensity (%)	Number of Districts With CI above State Average (%)
Konkan Division	4	107.0	Nil (0.00)
Nasik Division	4	125.0	01 (25)
Pune Division	3	127.0	01 (33)
Kolhapur Division	3	129.0	01 (33)
Aurangabad Division	3	148.0	03 (100)
Latur Division	5	152.0	04 (80)
Amravati Division	5	133.0	03 (60)
Nagpur Division	6	123.0	01 (17)

Source: Land Use Statistics 2015-16, Department of Agriculture, GoM

Note: Figures in the bracket indicate percentage of districts with score below the state average.

## 4.2.1 Rural Electrification

In rural electrification, the percentage of households having electricity connection is considered instead of percentage of villages electrified, as it is more pragmatic to capture the status of electrification in rural areas. Maharashtra, though having household electrification percentage (75%) above the national average (73.4%), is still far behind the top performing states (Goa, Punjab, Kerala, Tamil Nadu, Sikkim) in this regard (Table 4.1). At the district level, 21 out of 33 districts are above state and national average, and the inter-district variation is also less (only 15% of Coefficient of Variation).

The agriculture sector of Maharashtra consumes around 22% of total power consumption which is slightly higher than the national average of 20% as of 2013-14 (GoM (2017b)). However, the State lacks in terms of agriculture pumpsets energised where only 16% of total pumpsets have been converted to energy efficient technology in 2013-14, the national average being 28%. Maharashtra has a very good warehouse facility for the use in agriculture sector. In fact, it is among the top five states in the country in terms of warehouse capacity per unit of GCA. The State is, however, lagging in terms of mobile connection penetration in rural areas. According to the Census 2011, only 43% households are connected with wireless mobile technology. Only five districts of the State are above the national average in this respect.

## 4.2.2 Status of Irrigation

Irrigation is one of the most vital inputs as far as agricultural vis-à-vis rural development is concerned. The irrigated area in command area under the jurisdiction of Water Resources Department, Government of Maharashtra, increased from 24.48 lakh ha in 2012-13 to 32.60 lakh ha in 2013-14 (GoM, 2015). Due to implementation of fundamental reforms in the irrigation sector, the expenditure incurred on establishment, repairs & maintenance of projects has been met through the recovery of water charges for last ten years (GoM, 2015). Government expenditure on sprinkler and drip irrigation has also been increased from ₹ 192.11 crores in 2009-10 to ₹ 574.85 crores in 2012-13, though it reduced to ₹ 305.57 crores in the following year 2013-14 (GoM, 2015). The Government of Maharashtra has also been providing power subsidies to the agriculture sector. During the financial year 2014-15, a sum of ₹ 3552.99 crores has been provided as subsidy to electricity charges toward agricultural pumps (GoM, 2015). Despite all these efforts, the share of gross irrigated area to gross cropped area did not improve to a great extent. During 2009-10, the share of gross irrigated area to gross cropped area stood only at 17.9%, which is quite low.

Through the efforts of different schemes for irrigation improvement, the status of irrigation potential created and the potential realized thereof have improved in recent times. The data for irrigation potential realized during the financial year 2015-16 has been reported in Table 4.4, which shows a high level of variation (Coefficient of Variation is 64%) because of erratic rainfall over the last couple of years. Table 4.4 also shows that the Pune, Kolhapur and Nagpur divisions are performing strongly in terms of irrigation potential, followed by Amravati and Latur divisions. However, districts of Konkan division, Aurangabad division, and Latur division have failed to create any significant impact in this aspect.

**Table 4.4: Status of Irrigation Potential Realised at District Level**

Division	District	Irrigation Potential Realized (%)	Division	District	Irrigation Potential Realized (%)
Konkan Div.	Thane	19.27	Nagpur Div.	Wardha	51.43
	Raigad	10.64		Nagpur	82.19
	Ratnagiri	11.44		Bhandara	64.08
	Sindhudurg	16.96		Gondia	73.25
Nasik Div.	Nasik	34.85	Latur Div.	Chandrapur	57.99
	Dhule	18.29		Gadchiroli	79.39
	Nandurbar	8.5		Latur	8.54
Pune Div.	Jalgaon	18.49	Amravati Div.	Osmanabad	4.95
	Ahmadnagar	65.48		Nanded	35.05
	Pune	99.53		Parbhani	30.29
	Solapur	90.02		Hingoli	73.15
Kolhapur Div.	Satara	107.8	Amravati Div.	Buldhana	49.72
	Sangli	69.85		Akola	29.72
	Kolhapur	92.51		Washim	54.77
Aurangabad Div.	Aurangabad	37.11	Amravati Div.	Amravati	42.41
	Jalna	34.79		Yavatmal	39.79
	Beed	12.94			

Source: GoM (2017b)

### 4.3 Composite Index of Physical Infrastructure

What is derived from the previous discussion is that the districts of Maharashtra have experienced uneven development in terms of agriculture and rural infrastructure. In order to have comprehensive information about the status of physical infrastructural development at the district level of Maharashtra, the index has been prepared using PCA. The index scores of the districts along with their rankings are presented in the following Table 4.5. The index scores vary from the lowest value of 0.008 (Osmanabad) to the maximum of 1.561 (Kolhapur). The state average is 0.614 and the physical index scores at the district level further demonstrate high level of variation as measured by coefficient of variation (64.89% across the districts) which is relatively high as compared to variations in social and institutional indices (see chapter 5 and chapter 6).

**Table 4.5: Physical Infrastructure Index of Districts of Maharashtra**

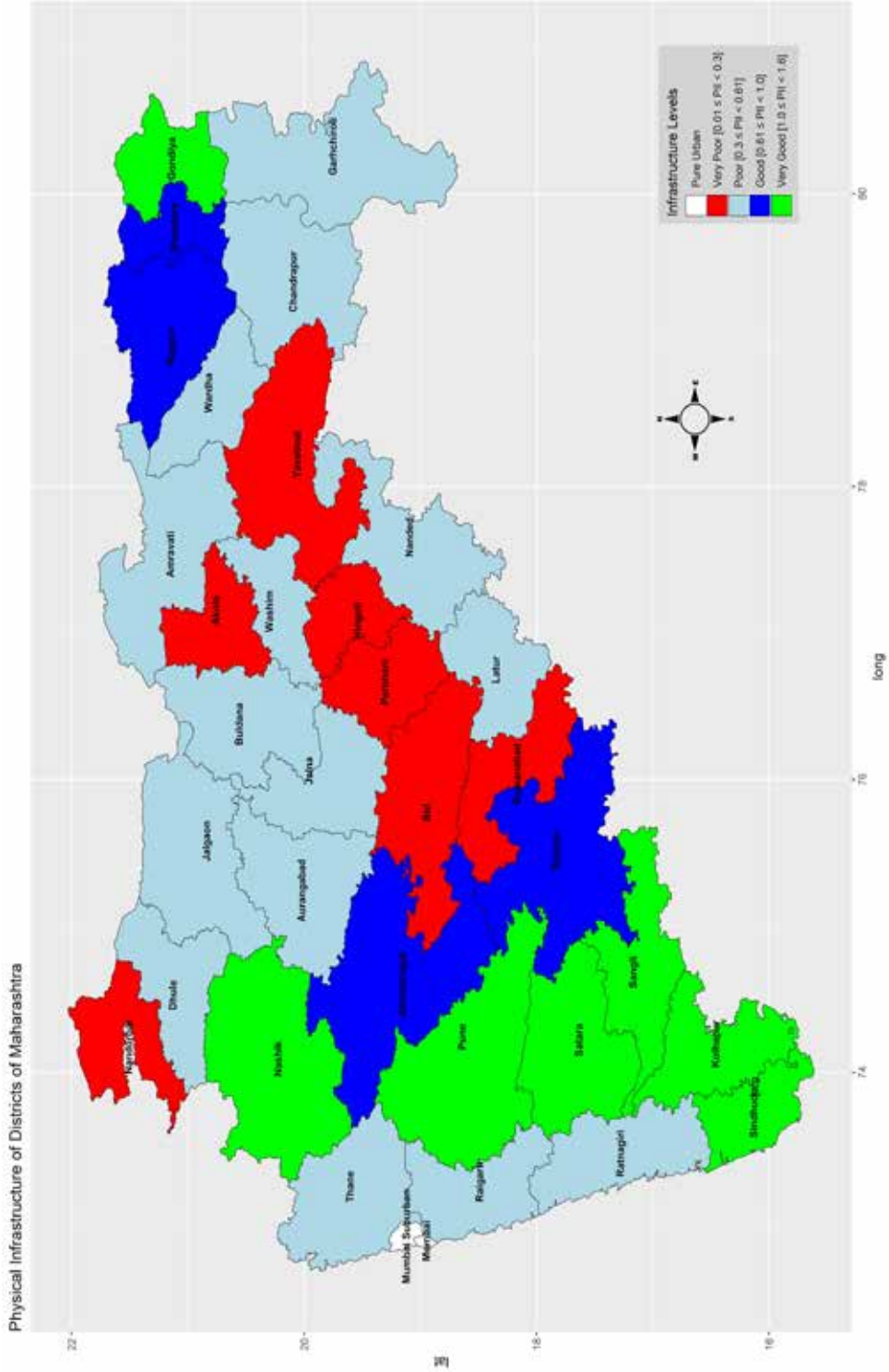
Districts	Physical Infrastructure Index	Rank	Districts	Physical Infrastructure Index	Rank
Kolhapur	1.561	1	Raigad	0.435	18
Satara	1.554	2	Ratnagiri	0.433	19
Pune	1.276	3	Aurangabad	0.430	20
Nasik	1.251	4	Buldhana	0.420	21
Gondia	1.109	5	Washim	0.403	22
Sangli	1.018	6	Jalna	0.369	23
Sindhudurg	1.006	7	Jalgaon	0.362	24
Solapur	0.979	8	Amravati	0.348	25
Bhandara	0.784	9	Latur	0.342	26
Nagpur	0.774	10	Hingoli	0.297	27
Ahmadnagar	0.712	11	Yavatmal	0.290	28
Thane	0.609	12	Nandurbar	0.237	29
Wardha	0.564	13	Beed	0.235	30
Chandrapur	0.537	14	Parbhani	0.207	31
Gadchiroli	0.531	15	Akola	0.201	32
Dhule	0.498	16	Osmanabad	0.008	33
Nanded	0.476	17	-	-	
State Average	0.614	Standard Deviation	0.398	Coefficient of Variation	64.89

Source: Authors' Calculation

A better picture of the level of relative performance of districts compared to state average is ascertained by analyzing the dimension- and component-level scores of the Physical Infrastructure Index, as presented in Table 4.6. District scores are divided into four performance groups, as shown in the Figure 4.1.

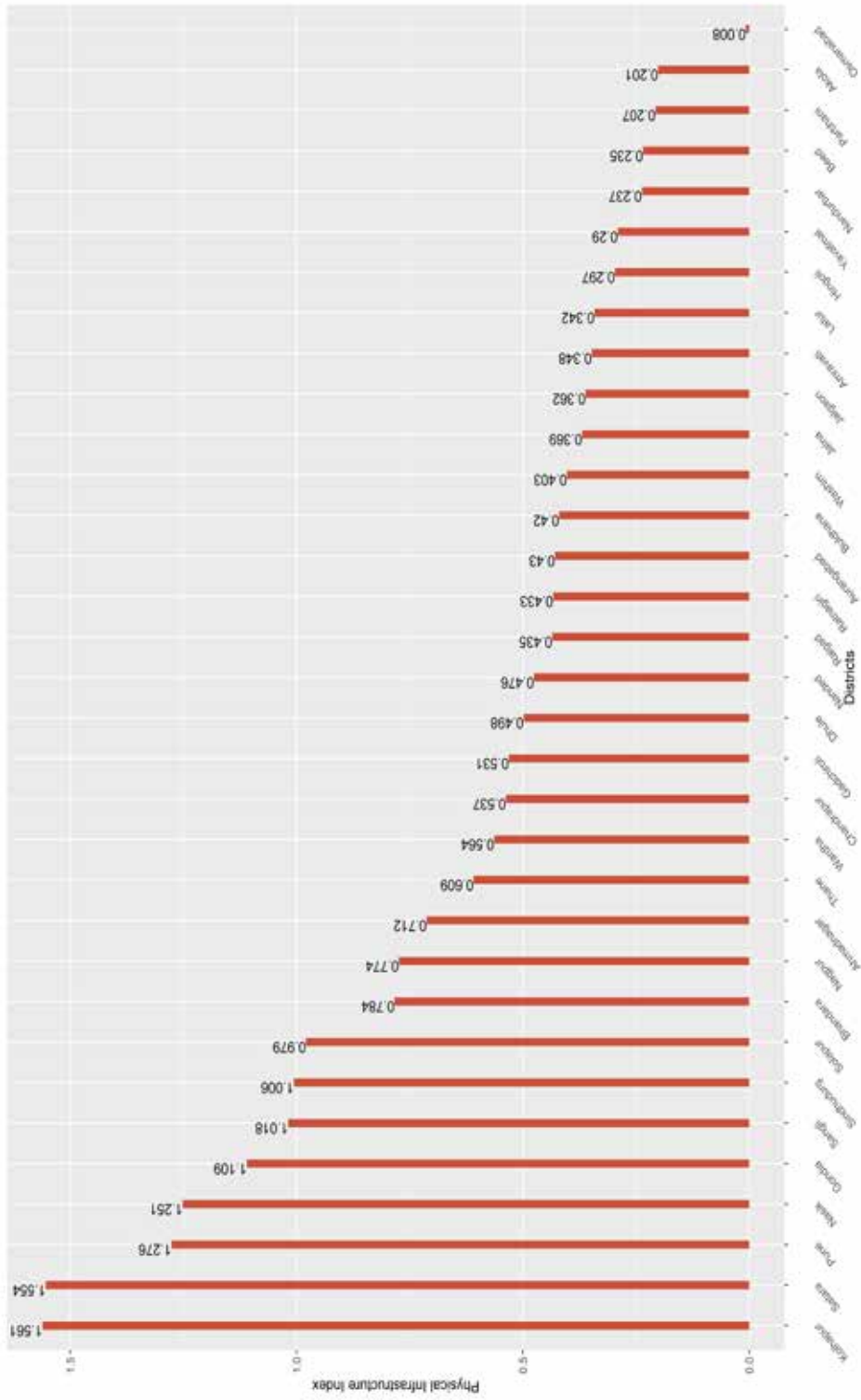
- High Performance districts (Green Colour)
- Good Performance districts (Blue Colour)
- Moderate Performance districts (Light Blue Colour)
- Lowest Performance districts (Red Colour)

Figure 4.1: Map of Physical Infrastructure of Districts of Maharashtra



Source: Author's Calculation

Figure 4.2: Bar Chart of Physical Infrastructure of Districts of Maharashtra



Source: Author's Calculation

**Table 4.6: Physical Infrastructure Index, Component Level Scores, Districts of Maharashtra**

District	CI	PUMP	IPR	RE	PCAg	RC	TRC	PUMPER	WHF	WSM	AGL	MOBC
Ahmadnagar	0.43	0.29	0.60	0.36	0.88	0.48	0.41	0.78	0.10	0.20	0.28	0.79
Akola	0.66	0.14	0.25	0.46	0.22	0.07	0.17	0.22	0.11	0.21	0.20	0.32
Amravati	0.36	0.18	0.37	0.46	0.32	0.20	0.15	0.36	0.08	0.26	0.21	0.20
Aurangabad	0.72	0.25	0.32	0.33	0.36	0.38	0.23	0.62	0.16	0.18	0.07	0.75
Beed	0.39	0.15	0.08	0.42	0.63	0.50	0.12	0.47	0.04	0.19	0.08	0.71
Bhandara	0.49	0.39	0.58	0.57	0.22	0.50	0.41	0.47	0.11	0.45	0.29	0.36
Buldhana	0.46	0.23	0.44	0.44	0.38	0.03	0.23	0.49	0.06	0.30	0.09	0.50
Chandrapur	0.19	0.18	0.52	0.42	0.06	0.19	0.23	0.19	0.08	0.56	0.19	0.22
Dhule	0.30	0.10	0.13	1.00	0.46	0.35	0.37	0.50	0.30	0.14	0.26	0.34
Gadchiroli	0.26	0.19	0.73	0.09	0.10	0.07	0.29	0.16	0.10	0.55	0.16	0.07
Gondia	0.38	0.49	0.67	0.60	0.13	0.45	0.30	0.29	1.00	0.68	0.13	0.36
Hingoli	0.87	0.19	0.67	0.32	0.64	0.28	0.11	0.35	0.01	0.26	0.10	0.69
Jalgaon	0.43	0.22	0.14	0.48	0.61	0.42	0.30	0.50	0.14	0.21	0.28	0.28
Jalna	0.62	0.36	0.30	0.39	0.42	0.30	0.16	0.41	0.07	0.18	0.15	0.57
Kolhapur	0.43	0.79	0.86	0.79	0.20	0.41	0.71	0.70	0.68	0.12	0.66	0.63
Latur	0.40	0.27	0.04	0.50	0.47	0.34	0.18	0.51	0.04	0.33	0.13	0.64
Nagpur	0.20	0.23	0.76	0.57	0.09	0.26	0.28	0.40	0.08	0.45	0.34	0.27
Nanded	0.26	0.29	0.30	0.34	0.35	0.36	0.07	0.42	0.02	0.51	0.25	0.58
Nandurbar	0.28	0.01	0.04	0.05	0.42	0.55	0.28	0.39	0.28	0.36	0.18	0.05
Nasik	0.17	0.60	0.30	0.21	0.44	0.57	1.00	1.00	0.11	0.38	0.67	0.63
Osmanabad	1.00	0.18	0.00	0.29	0.81	0.31	0.16	0.57	0.04	0.24	0.12	0.56
Parbhani	0.84	0.20	0.25	0.38	0.54	0.34	0.10	0.31	0.07	0.28	0.21	0.68
Pune	0.35	0.42	0.93	0.58	0.33	0.54	0.56	0.78	0.06	0.22	0.73	1.00
Raigad	0.17	0.05	0.06	0.74	0.01	0.23	0.07	0.20	0.11	1.00	0.34	0.36
Ratnagiri	0.04	0.13	0.07	0.84	0.00	0.51	0.01	0.15	0.00	0.05	0.75	0.25
Sangli	0.34	0.43	0.64	0.53	0.54	1.00	0.40	0.88	0.07	0.18	0.55	0.67
Satara	0.27	1.00	1.01	0.68	0.36	0.46	0.52	0.79	0.21	0.33	0.59	0.78
Sindhudurg	0.16	0.50	0.12	0.85	0.02	0.85	0.02	0.41	0.59	0.11	1.00	0.50
Solapur	0.18	0.42	0.84	0.14	1.00	0.52	0.32	0.95	0.41	0.19	0.28	0.76
Thane	0.03	0.13	0.14	0.91	0.00	0.35	0.10	0.01	0.08	0.57	0.81	0.37
Wardha	0.32	0.25	0.46	0.67	0.19	0.12	0.16	0.44	0.06	0.33	0.32	0.41
Washim	0.46	0.16	0.49	0.46	0.36	0.08	0.20	0.28	0.14	0.24	0.20	0.44
Yavatmal	0.19	0.18	0.34	0.28	0.37	0.10	0.09	0.31	0.06	0.38	0.04	0.30
Maharashtra	0.38	0.29	0.41	0.49	0.36	0.37	0.26	0.46	0.17	0.32	0.32	0.49
C.V. among districts	60.4	71.2	71.4	47.3	70.0	58.1	78.7	51.7	129.1	60.2	77.1	46.7

Source: Authors' calculation

Note: Colouring of the table is based on the level of performance (scores) on Physical Infrastructure Index, its dimensions and components. Green signifies high; blue represents average, black represents moderately low and red represent very low performance.



## 4.4 Region-wise Rankings of Districts

In order to identify lagged districts, all 33 districts are classified into 8 agricultural divisions. Each district within the region has been classified into two groups of colours: (1) green if its respective score is above and (2) black if its score is below the state average for each parameter. The number of districts whose score is below the state average in each division for each indicator is presented in Table 4.7. It is clear that laggard districts are mainly concentrated in Latur, Amaravati, Aurangabad and Konkan. Divisions such as Kolhapur, Pune, Nasik and Nagpur are best performing in the state of Maharashtra.

**Table 4.7: Component Level Scores of Districts of Agri-divisions of Maharashtra**

District	CI	PUMP	IPR	RE	PCAg	RC	TRC	PUMPER	WHF	WSM	AGL	MOBC
Thane	0.03	0.13	0.14	0.91	0.00	0.35	0.10	0.01	0.08	0.57	0.81	0.37
Raigad	0.17	0.05	0.06	0.74	0.01	0.23	0.07	0.20	0.11	1.00	0.34	0.36
Ratnagiri	0.04	0.13	0.07	0.84	0.00	0.51	0.01	0.15	0.00	0.05	0.75	0.25
Sindhudurg	0.16	0.50	0.12	0.85	0.02	0.85	0.02	0.41	0.59	0.11	1.00	0.50
<b>Konkan Div.</b>	<b>0.10</b>	<b>0.20</b>	<b>0.10</b>	<b>0.83</b>	<b>0.01</b>	<b>0.48</b>	<b>0.05</b>	<b>0.19</b>	<b>0.20</b>	<b>0.43</b>	<b>0.73</b>	<b>0.37</b>
Nasik	0.17	0.60	0.30	0.21	0.44	0.57	1.00	1.00	0.11	0.38	0.67	0.63
Dhule	0.30	0.10	0.13	1.00	0.46	0.35	0.37	0.50	0.30	0.14	0.26	0.34
Nandurbar	0.28	0.01	0.04	0.05	0.42	0.55	0.28	0.39	0.28	0.36	0.18	0.05
Jalgaon	0.43	0.22	0.14	0.48	0.61	0.42	0.30	0.50	0.14	0.21	0.28	0.28
<b>Nasik Div</b>	<b>0.29</b>	<b>0.23</b>	<b>0.15</b>	<b>0.43</b>	<b>0.48</b>	<b>0.47</b>	<b>0.49</b>	<b>0.60</b>	<b>0.21</b>	<b>0.27</b>	<b>0.35</b>	<b>0.33</b>
Ahmadnagar	0.43	0.29	0.60	0.36	0.88	0.48	0.41	0.78	0.10	0.20	0.28	0.79
Pune	0.35	0.42	0.93	0.58	0.33	0.54	0.56	0.78	0.06	0.22	0.73	1.00
Solapur	0.18	0.42	0.84	0.14	1.00	0.52	0.32	0.95	0.41	0.19	0.28	0.76
<b>Pune Div.</b>	<b>0.32</b>	<b>0.38</b>	<b>0.79</b>	<b>0.36</b>	<b>0.73</b>	<b>0.52</b>	<b>0.43</b>	<b>0.84</b>	<b>0.19</b>	<b>0.20</b>	<b>0.43</b>	<b>0.85</b>
Satara	0.27	1.00	1.01	0.68	0.36	0.46	0.52	0.79	0.21	0.33	0.59	0.78
Sangli	0.34	0.43	0.64	0.53	0.54	1.00	0.40	0.88	0.07	0.18	0.55	0.67
Kolhapur	0.43	0.79	0.86	0.79	0.20	0.41	0.71	0.70	0.68	0.12	0.66	0.63
<b>Kolhapur Div.</b>	<b>0.35</b>	<b>0.74</b>	<b>0.84</b>	<b>0.67</b>	<b>0.37</b>	<b>0.62</b>	<b>0.54</b>	<b>0.79</b>	<b>0.32</b>	<b>0.21</b>	<b>0.60</b>	<b>0.69</b>
Aurangabad	0.72	0.25	0.32	0.33	0.36	0.38	0.23	0.62	0.16	0.18	0.07	0.75
Beed	0.39	0.15	0.08	0.42	0.63	0.50	0.12	0.47	0.04	0.19	0.08	0.71
Jalna	0.62	0.36	0.30	0.39	0.42	0.30	0.16	0.41	0.07	0.18	0.15	0.57

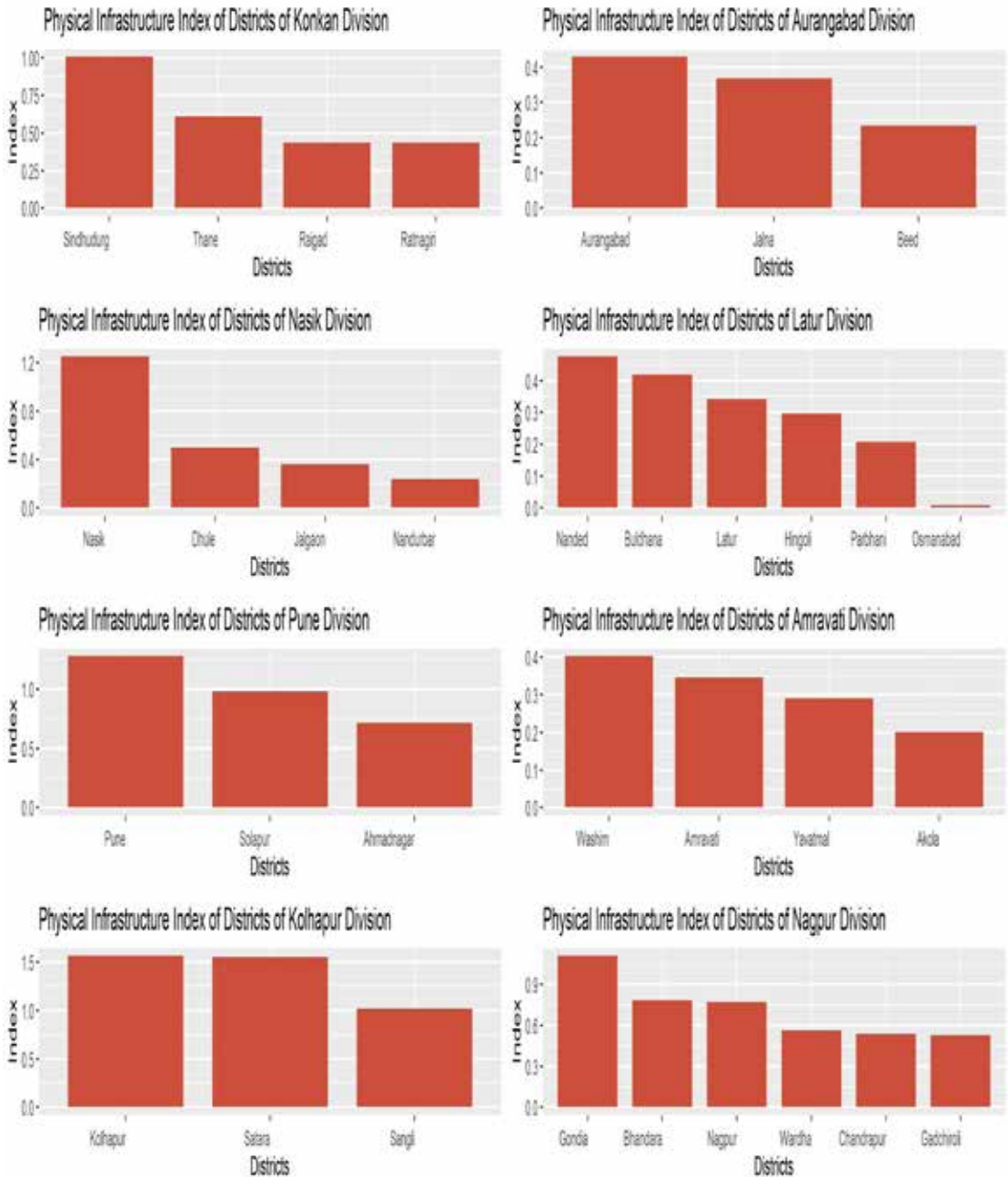
District	CI	PUMP	IPR	RE	PCAg	RC	TRC	PUMPER	WHF	WSM	AGL	MOBC
<b>Aurangabad Div.</b>	<b>0.57</b>	<b>0.25</b>	<b>0.23</b>	<b>0.38</b>	<b>0.47</b>	<b>0.39</b>	<b>0.17</b>	<b>0.50</b>	<b>0.09</b>	<b>0.18</b>	<b>0.10</b>	<b>0.68</b>
Latur	0.40	0.27	0.04	0.50	0.47	0.34	0.18	0.51	0.04	0.33	0.13	0.64
Nanded	0.26	0.29	0.30	0.34	0.35	0.36	0.07	0.42	0.02	0.51	0.25	0.58
Osmanabad	1.00	0.18	0.00	0.29	0.81	0.31	0.16	0.57	0.04	0.24	0.12	0.56
Parbhani	0.84	0.20	0.25	0.38	0.54	0.34	0.10	0.31	0.07	0.28	0.21	0.68
Hingoli	0.87	0.19	0.67	0.32	0.64	0.28	0.11	0.35	0.01	0.26	0.10	0.69
<b>Latur Div</b>	<b>0.68</b>	<b>0.22</b>	<b>0.25</b>	<b>0.37</b>	<b>0.56</b>	<b>0.33</b>	<b>0.12</b>	<b>0.43</b>	<b>0.04</b>	<b>0.32</b>	<b>0.16</b>	<b>0.63</b>
Akola	0.66	0.14	0.25	0.46	0.22	0.07	0.17	0.22	0.11	0.21	0.20	0.32
Amravati	0.36	0.18	0.37	0.46	0.32	0.20	0.15	0.36	0.08	0.26	0.21	0.20
Buldhana	0.46	0.23	0.44	0.44	0.38	0.03	0.23	0.49	0.06	0.30	0.09	0.50
Washim	0.46	0.16	0.49	0.46	0.36	0.08	0.20	0.28	0.14	0.24	0.20	0.44
Yavatmal	0.19	0.18	0.34	0.28	0.37	0.10	0.09	0.31	0.06	0.38	0.04	0.30
<b>Amravati Div.</b>	<b>0.43</b>	<b>0.18</b>	<b>0.38</b>	<b>0.42</b>	<b>0.33</b>	<b>0.10</b>	<b>0.17</b>	<b>0.33</b>	<b>0.09</b>	<b>0.28</b>	<b>0.15</b>	<b>0.35</b>
Bhandara	0.49	0.39	0.58	0.57	0.22	0.50	0.41	0.47	0.11	0.45	0.29	0.36
Chandrapur	0.19	0.18	0.52	0.42	0.06	0.19	0.23	0.19	0.08	0.56	0.19	0.22
Gadchiroli	0.26	0.19	0.73	0.09	0.10	0.07	0.29	0.16	0.10	0.55	0.16	0.07
Gondia	0.38	0.49	0.67	0.60	0.13	0.45	0.30	0.29	1.00	0.68	0.13	0.36
Nagpur	0.20	0.23	0.76	0.57	0.09	0.26	0.28	0.40	0.08	0.45	0.34	0.27
Wardha	0.32	0.25	0.46	0.67	0.19	0.12	0.16	0.44	0.06	0.33	0.32	0.41
<b>Nagpur Div.</b>	<b>0.31</b>	<b>0.29</b>	<b>0.62</b>	<b>0.49</b>	<b>0.13</b>	<b>0.26</b>	<b>0.28</b>	<b>0.33</b>	<b>0.24</b>	<b>0.50</b>	<b>0.24</b>	<b>0.28</b>
Maharashtra	0.38	0.29	0.41	0.49	0.36	0.37	0.26	0.46	0.17	0.32	0.32	0.49

Source: Authors calculation

Note: Colouring of the table is based on the level of performance (individual scores against state average). Green signifies above state average, and black represents below state average.

The rankings of districts within the region on overall physical infrastructure index is also provided in Figure 4.3. It is clear that there are huge intra-division variations among districts. Using the physical index scores, the eight divisions of the State have also been ranked and the results have been reported in Table 4.8 and graphically in Figure 4.4.

**Figure 4.3: Combined Bar Chart for Physical Infrastructure Index of Districts Across Divisions**

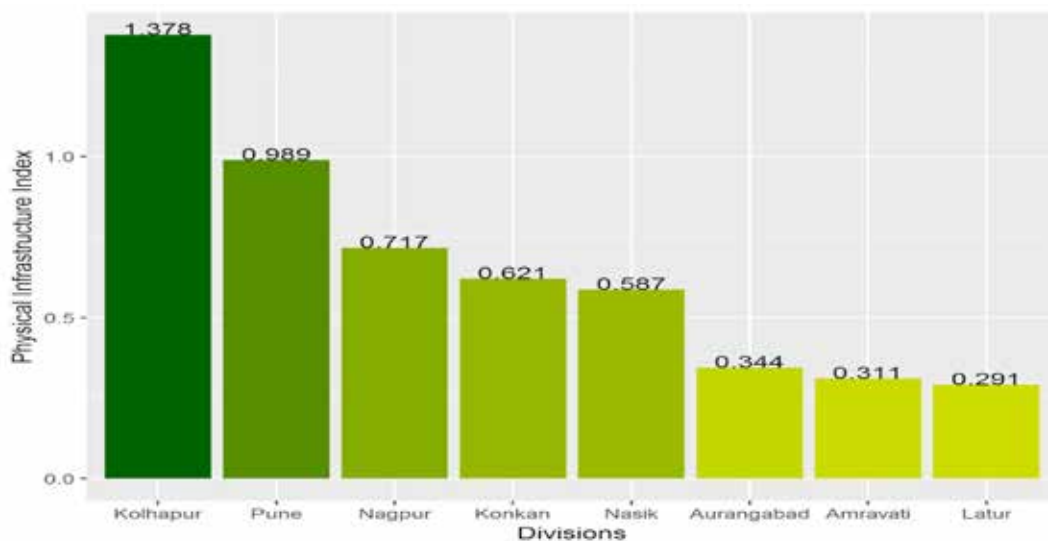


Source: Authors' calculation

**Table 4.8: Physical Infrastructure Index of Agri-Divisions**

Division	Physical Score	Rank
Kolhapur	1.378	1
Pune	0.989	2
Nagpur	0.717	3
Konkan	0.621	4
Nasik	0.587	5
Aurangabad	0.344	6
Amravati	0.332	7
Latur	0.266	8

Source: Authors' calculation

**Figure 4.4: Barplot of Physical Infrastructure Index of Agricultural Divisions of Maharashtra**

Source: Authors' calculation

Only 12 districts out of 33 districts are above the state average score of 0.614. Also, by looking at the physical infrastructure index score, it is clear that some polarisation is taking place among the districts of the State in terms of physical infrastructure in rural Maharashtra. The districts of three divisions viz. Kolhapur, Pune and Nasik, are occupying the top positions in terms of physical infrastructure score. From the rest of Maharashtra, only few districts (viz. Gondia, Nagpur and Bhandara from Nagpur division and Sindhudurg from Konkan division) have physical ranking score above the state average. The districts of central and western Maharashtra are laggard districts in terms of overall physical infrastructure score.

Among the divisions, Kolhapur ranks at the top followed by Pune and Nagpur divisions at second and third positions respectively. Aurangabad, Amravati and Latur divisions are at the bottom of the table having physical infrastructure index score less than the state average. In Nagpur division, there are six districts viz. Wardha, Nagpur, Bhandara, Gondia, Chandrapur and Gadchiroli. Except for Gondia, Nagpur and Bhandara, the remaining three districts (Wardha, Chandrapur and Gadchiroli) are ranked below the state average. The index scores of the best performing districts (viz. Gondia, Nagpur and Bhandara) in Nagpur division are in fact pooling the division as whole in the top three brackets. So, it is quite evident that there is clear polarisation in terms of overall physical infrastructure of the districts in the State. Three agricultural divisions such as Kolhapur, Pune, and some selected districts (Nagpur, Gondia and Bhandara) of Nagpur agricultural division are doing well compared to the other agri-divisions of the State. Among these, Pune and Kolhapur are broadly included in the western Maharashtra administrative division. Nagpur agricultural division is a part of Vidarbha administrative division. However, the districts which are parts of administrative divisions of Marathwada and Khandesh and districts of Vidarbha (excluding Nagpur, Gondia and Bhandara) are not well equipped with physical infrastructure to boost up their economic growth.

For the purpose of comparing the physical infrastructure index of eight divisions of Maharashtra, one-way ANOVA technique was applied and the results are shown below:

The hypothesis to be tested:

$$H_0 : PII_{konkan} = PII_{nasik} = PII_{pune} = PII_{kolhapur} = PII_{aurangabad} = PII_{latur} = PII_{amravati} = PII_{nagpur}$$

against

$$H_1 : \text{Not all PII are equal}$$

*PII* stands for Physical Infrastructure Index

**Table 4.9: One-way ANOVA for Physical Infrastructure Index among Divisions**

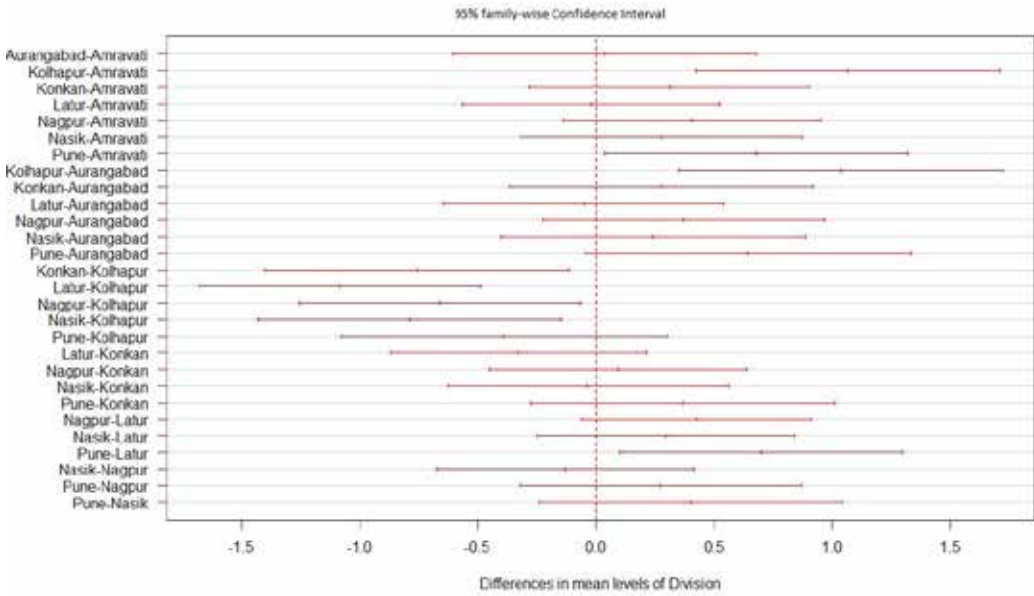
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	3.450	7	.493	7.569	.000
Within Groups	1.628	25	.065		
Total	5.078	32			

Source: Authors' calculation

The F-test results indicate that the eight agri-divisions of the State are not performing at par in terms of physical infrastructure which prompts further post-hoc analysis to identify the most backward regions and inter-divisions comparison. Tukey's post-hoc analysis is shown graphically in Figure 4.5.

It is seen from the two diagrams (Figure 4.4 and Figure 4.5) that Kolhapur and Pune divisions are performing well in terms of physical infrastructure followed by Nagpur and Konkan divisions, while the Amravati, Aurangabad and Latur divisions are lagging behind other divisions of the State.

**Figure 4.5: Tukey Post-hoc Plot of Infrastructure Index of Agri-Divisions**

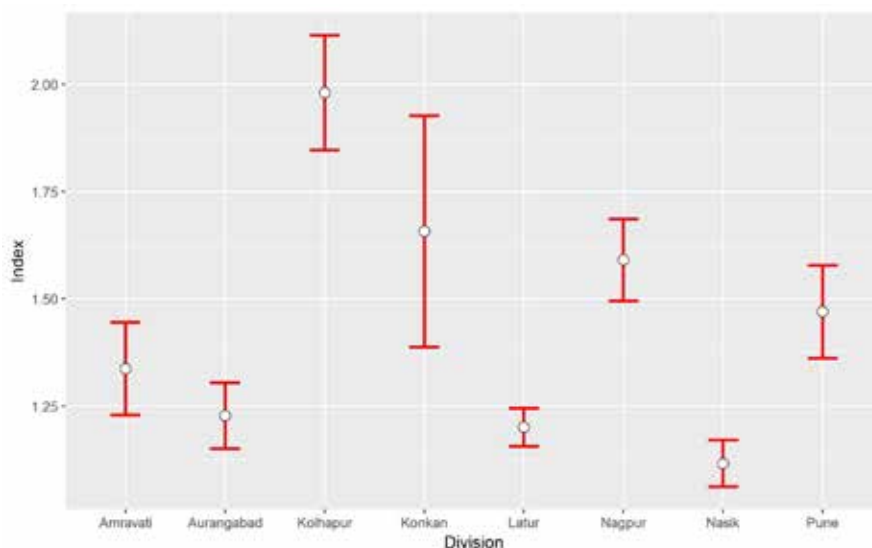


Source: Authors' calculation

## 4.5 Reasons for Backwardness

By looking at the performance of the districts of the State in terms of physical infrastructure, it is clear that the districts of western Maharashtra and Nagpur divisions are performing relatively better compared to the rest of Maharashtra. The relative performance of the districts of eight agricultural divisions is displayed in the Table 4.10 where the number of districts in each divisions which are performing lower than the state average are displayed.

**Figure 4.6: Error Barplot of Physical Infrastructure Index of Agri-Divisions of Maharashtra**



Source: Authors' calculation

**Table 4.10: Number of Districts with Score Below the State Average**

Agricultural Division		Pumpset per '000 of GCA	Electrified household	Rural road density	Tractor per '000 of GCA	Pumpset energised	Cropping Intensity
	No. of districts	No. of districts below state average	No. of districts below state average	No. of districts below state average	No. of districts below state average	No. of districts below state average	No. of districts below state average
Konkan	4	3 (75)	2 (50)	2 (50)	2 (50)	1 (25)	2 (50)
Nasik	4	2 (50)	0 (0)	3 (75)	3 (75)	4 (100)	2 (50)
Pune	3	2 (67)	1 (33)	0 (0)	3 (33)	1 (33)	2 (66)
Kolhapur	3	3 (100)	0 (0)	1 (33)	2 (66)	2 (66)	3 (100)
Aurangabad	3	2 (67)	1 (33)	1 (33)	2 (66)	1 (33)	1 (33)
Latur	5	4 (80)	2 (40)	3 (60)	3 (60)	4 (80)	3 (80)
Amravati	5	5 (100)	2 (40)	5 (100)	5 (100)	5 (100)	2 (40)
Nagpur	6	1 (17)	3 (50)	0 (0.0)	1 (17)	0 (0.0)	3 (50)

Source: Authors' calculation

Note: Figures in the bracket indicate percentage of districts with score below the state average.

It is evident from Table 4.10 that districts of Latur and Amravati are not well off in terms of pumpset availability per thousand hectares of GCA, rural road density, farm mechanization (measured by number of tractors per thousand hectares of GCA) and pumpsets energised for irrigation and cropping intensity. It is also seen that Kolhapur division comprising districts such as Kolhapur, Satara and Sangli, all of which rank among the top districts in physical infrastructure, are not doing well as far as pumpset availability per hundred hectares of GCA and cropping intensity, farm mechanization, are considered. But this is not surprising as Kolhapur division is one of the main sugarcane producing areas in the State. Sugarcane is highly remunerative cash crop and because of high maturity period, the average cropping intensity of this division is not very high. For the same reason, cropping pattern is biased toward sugarcane, the farm mechanization and pumpset availability per hundred hectares of GCA are also showing similar pattern (not very high). However, the division is in general performing well compared to other agricultural divisions of the State.

In comparison to top ranked districts (viz. Kolhapur, Satara, Pune, Nasik, Gondia, Sindhudurg, Sangli, Solapur, Bhandara, Nagpur and Ahmednagar), the rest of Maharashtra (remaining 22 districts) are still characterized by poor infrastructure such as poor roads, irrigation potential, cropping intensity, rural household electrification, farm mechanization and pumpsets energized. In fact, as many as 19 districts out of 33 districts (which are included in this study) are below the state average cropping intensity of 133%, while as many as 26 districts are below the national average. Agriculture, the main source of livelihood of these regions faces several challenges which include inter alia (a) making agriculture profitable, (b) generating local employment (c) reducing the burden of population dependent on agriculture (GoM, 2013). The Committee has suggested 21 indicators for assessment of the state of regional variations, development deficit and regional development potential in agriculture sector of these backward districts. These 21 indicators are as follows:

1. Horticulture, 2. Forest Cover, 3. Cropping Intensity, 4. Fertilizer Consumption, 5. Agricultural Mechanization, 6. Population Pressure on Agriculture, 7. Agriculture Budget, 8. Livestock, Poultry and Fishery, 9. Land Holding, 10. Drought Prone Area, 11. Watershed, 12. Irrigation, 13. Village Road Connectivity, 14. Compound Annual Growth Rate (CAGR) of Major Crops, 15. Agriculture Labor 16. Crop Loan, 17. Agricultural Market Infrastructure, 18. Agriculture Education, 19. Agriculture Research Centres, 20. Agrobased Industries and 21. Electrical Energy in Agriculture sector.

Even at present, these backward districts are still lagging behind the developed districts of the State in terms of many of these indicators such as cropping intensity, farm mechanization, irrigation, road connectivity, agricultural market and agricultural clinics.



However, in this connection, it should be mentioned that the cropping intensity is relatively low in some of the districts of Pune division and in all the districts of Kolhapur divisions, though their overall physical infrastructure index is quite high. The reasons are that in these districts, the cropping pattern has been diversified over the years towards high-valued crops such as horticulture, vegetables and sugarcane. The average gestation period for horticulture and sugarcane cultivation are relatively high and they are, in general, more remunerative compared to the traditional cereals and foodgrain crops. This is the possible reason for having relatively low cropping intensity for the districts of these two advanced agricultural divisions and even then they are grabbing the top positions in the infrastructure ranking.

The relative ranking of districts in physical infrastructure has identified following major areas that would accelerate agricultural growth of the rural economy.

- lack of availability of assured water supply for crops;
- lack of appropriate missions and incentives for the relevant regional crop pattern suitable on the basis of agro-climatic condition;
- generation and diffusion of technological knowledge together with its institutional support and policy support for the technological leap that would be feasible for the lagging districts.

## 4.6 Conclusion

The physical infrastructure index through principal component analysis and the subsequent one-way ANOVA analysis for the eight agricultural divisions draw the following main conclusions vis-à-vis the physical infrastructure of the State:

- The State fails to maintain equal physical infrastructure for all the 33 districts and there appears to be a clear polarization in terms of provision of physical infrastructure among the districts. The districts of Kolhapur, Pune and some districts of Nagpur are well off in terms of physical infrastructure, while the rest of Maharashtra is far away from providing sufficient physical infrastructure for the development of rural areas.
- The backward districts are lagging in terms of farm mechanization, household electrification and pumpset availability for irrigation per thousand hectares of gross cropped area and conversion of agricultural pumpsets to energy-efficient pumpsets.
- The lack of availability of assured water supply for crops in the farming sector is a serious infrastructural deficiency which acts as the main tailback for the agricultural and rural development of the districts.



# Rural Development Infrastructure Index

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## Chapter- 5

### Social Infrastructure Index

## 5.1 Introduction

Social sector includes numerous dimensions such as primary education, public health, housing, drinking water, sanitation, etc. as the key areas of improvement for social infrastructure, which contribute to better quality of life for the common citizens. Each one of these assumes importance in its own right and capacity and has association with the others. Social infrastructure has also stimulated demand in industries such as IT/ITES, education, healthcare, hospitality and others, by creating the right infrastructure for their existence. Like physical infrastructure, social sector is also a vital sector in the economy because it improves the quality of human life as well as helps to stimulate economic development. Human capital can play a significant role in lifting people out of poverty and enabling them to lead a healthy and productive life.

Despite a significant improvement in Human Development Index (HDI) score over the years, Maharashtra's rank in HDI stood at seven out of the 20 major states in India as per Human Development Report (HDR), 2014. For example, the HDI score of Maharashtra increased from 0.57 in 2008 to 0.66 in 2014, an increase of 14% over 2008 (Kundu, 2015).

Given the importance of social infrastructure for human development and overall development of an economy, this chapter provides an in-depth social infrastructure rankings of 33 districts of Maharashtra. The social infrastructure index includes: education, health, housing amenities and environment, which are crucial parameters contributing to enhancing the liveability of rural population.

## 5.2 Educational Infrastructure

The rankings of districts with respect to educational development are presented in Table 5.1. Three dimensions of educational infrastructure are considered which include: i) rural literacy rate (RLR) ii) rural school density ('000' children) (SD) and iii) percentage of schools with more than a single teacher (SST). Higher the value of the three aspects (literacy rate, rural school density and schools with more than single teacher), better is the situation. From Table 5.1, it is clear that in terms of rural literacy rate, Sindhudurg, Akola, Wardha, Amravati, Gondia, Bhandara, Satara, Nagpur and Ratnagiri are best performing districts in Maharashtra. Washim, Pune, Buldhana, Sangli, Yavatmal, Kolhapur and Raigad are doing moderately better than the state average.

**Table 5.1: Rankings of Districts on Educational Infrastructure**

Districts	RLR	Ranks	Districts	SD	Ranks	Districts	SST	Ranks
Sindhudurg	0.940	1	Sindhudurg	0.798	1	Beed	0.972	1
Akola	0.895	2	Ratnagiri	0.651	2	Bhandara	0.963	2
Wardha	0.895	3	Gadchiroli	0.543	3	Gondia	0.963	3
Amravati	0.892	4	Raigad	0.419	4	Satara	0.948	4
Gondia	0.866	5	Satara	0.385	5	Washim	0.937	5
Bhandara	0.832	6	Wardha	0.354	6	Kolhapur	0.934	6
Satara	0.819	7	Gondia	0.352	7	Ahmadnagar	0.911	7
Nagpur	0.819	8	Bhandara	0.343	8	Amravati	0.907	8
Ratnagiri	0.812	9	Beed	0.325	9	Osmanabad	0.901	9
Washim	0.792	10	Chandrapur	0.309	10	Aurangabad	0.887	10
Pune	0.782	11	Yavatmal	0.299	11	Dhule	0.878	11
Buldhana	0.780	12	Ahmadnagar	0.296	12	Nagpur	0.868	12
Sangli	0.778	13	Sangli	0.291	13	Hingoli	0.868	13
Yavatmal	0.766	14	Solapur	0.268	14	Solapur	0.859	14
Kolhapur	0.752	15	Washim	0.261	15	Buldhana	0.859	15
Raigad	0.747	16	Amravati	0.258	16	Nandurbar	0.857	16
Chandrapur	0.684	17	Nandurbar	0.253	17	Chandrapur	0.839	17
Ahmadnagar	0.684	18	Kolhapur	0.246	18	Jalna	0.839	18
Osmanabad	0.682	19	Osmanabad	0.245	19	Parbhani	0.836	19
Nasik	0.657	20	Latur	0.234	20	Yavatmal	0.831	20
Hingoli	0.648	21	Dhule	0.233	21	Jalgaon	0.797	21
Latur	0.633	22	Akola	0.227	22	Wardha	0.790	22
Jalgaon	0.626	23	Nanded	0.226	23	Latur	0.789	23
Solapur	0.613	24	Jalna	0.222	24	Akola	0.769	24
Beed	0.612	25	Hingoli	0.209	25	Pune	0.738	25
Gadchiroli	0.607	26	Buldhana	0.205	26	Sindhudurg	0.734	26
Nanded	0.562	27	Nagpur	0.194	27	Gadchiroli	0.731	27
Aurangabad	0.554	28	Parbhani	0.190	28	Nanded	0.706	28
Thane	0.512	29	Aurangabad	0.187	29	Sangli	0.650	29
Parbhani	0.507	30	Jalgaon	0.173	30	Ratnagiri	0.499	30
Jalna	0.472	31	Nasik	0.170	31	Nasik	0.451	31
Dhule	0.449	32	Pune	0.153	32	Thane	0.184	32
Nandurbar	0.268	33	Thane	0.014	33	Raigad	0.132	33
Maharashtra	0.695		Maharashtra	0.289		Maharashtra	0.782	

Source: Authors' calculation

Notes: The score for Maharashtra is the average value of 33 districts considered above.

All together, there are 16 districts whose performances are better than the state average. On the other hand, there are 17 districts whose performances are below the state average and among them, Nanded, Aurangabad, Thane, Parbhani, Jalna, Dhule and Nandurbar are the worse performing.

Similarly, in terms of school density (per '000' children), it is clear that there exists wide variation among districts in Maharashtra. For example, only four districts are performing exceedingly well compared to state average and these districts are Sindhudurg, Ratnagiri, Gadchiroli and Raigad. Districts like Satara, Wardha, Gondia, Bhandara, Beed, Chandrapur, Yavatmal, Ahmadnagar and Sangli are performing moderately better than the state average. All together, there are only 13 districts whose performances are better than the state average. On the other hand, there are 20 districts, whose performances are below the state average, and they include districts such as Nagpur, Parbhani, Aurangabad, Jalgaon, Nasik, Pune and Thane.

The third and final indicator used to measure the performance of education level among districts is percentage of schools with more than a single teacher. Here, districts with lower percent schools with single teacher are considered better. Like school density, this indicator also shows skewed picture for Maharashtra. Surprisingly, some districts whose performance is below the state average in terms of school density have done well on this parameter. For example, Beed, Washim, Ahmadnagar, Amravati, Osmanabad, Aurangabad, Dhule, Nandurbar, Jalna and Parbhani are doing exceedingly well compared to few best performing districts (in terms of rural literacy and school density) such as Sindhudurg, Raigad and Ratnagiri.

Overall, it is clear that in terms of educational infrastructure for rural areas, there exists large disparity among districts in Maharashtra. Sindhudurg, Ratnagiri, Gadchiroli, Raigad, Satara and Kolhapur are best performing districts, while Nanded, Aurangabad, Thane, Parbhani, Dhule, Jalna, Latur and Nandurbar are worse performing districts in Maharashtra. The ranking of districts by this study corroborates with the findings by the Kelkar Committee Report (cited as GoM, 2013). According to this report, districts like Nanded, Parbhani, Dhule, Latur and Nandurbar rank at the bottom on the education development measure, and these laggard districts mainly belong to Marathwada and Vidarbha region. Districts like Sindhudurg, Kolhapur, Raigad and Satara, which are performing well on educational development measure, are also the best performing districts on other indicators.

### 5.3 Health Infrastructure

There are three dimensions of health infrastructure for rural areas and they are: i) number of beds ('000' people), ii) number of hospitals per lakh rural population and iii) percentage of institutional deliveries<sup>1</sup>. The ranking of districts on these dimensions is provided in Table 5.2. It is evident that like educational infrastructure, there also exists wide disparity among districts on health infrastructure. For example, in terms of number of beds ('000' people), districts like Kolhapur, Satara, Wardha, Sindhudurg, Sangli and Nagpur are best performing districts, whereas Jalna,

<sup>1</sup> Institutional delivery refers to the childbirth at technology-equipped medical facility under supervision of skilled medical staff. In an institutional delivery, various medical tools and technologies are used to ascertain that health of neonate or mother is not compromised.

**Table 5.2: Rankings of Districts on Health Infrastructure**

Districts	BED	Ranks	Districts	ID	Ranks	Districts	HD	Ranks
Kolhapur	0.918	1	Sindhudurg	1.000	1	Sindhudurg	0.891	1
Satara	0.690	2	Beed	0.938	2	Ratnagiri	0.845	2
Wardha	0.592	3	Satara	0.918	3	Gadchiroli	0.775	3
Sindhudurg	0.479	4	Kolhapur	0.903	4	Nandurbar	0.636	4
Sangli	0.465	5	Latur	0.888	5	Chandrapur	0.588	5
Nagpur	0.429	6	Ratnagiri	0.883	6	Gondia	0.445	6
Gadchiroli	0.377	7	Wardha	0.880	7	Bhandara	0.404	7
Ratnagiri	0.312	8	Nagpur	0.880	8	Nagpur	0.378	8
Ahmadnagar	0.279	9	Parbhani	0.845	9	Raigad	0.373	9
Raigad	0.276	10	Amravati	0.843	10	Thane	0.315	10
Pune	0.266	11	Pune	0.833	11	Wardha	0.308	11
Amravati	0.216	12	Thane	0.828	12	Osmanabad	0.300	12
Beed	0.193	13	Osmanabad	0.818	13	Amravati	0.293	13
Buldhana	0.192	14	Sangli	0.795	14	Nasik	0.291	14
Parbhani	0.186	15	Ahmadnagar	0.780	15	Satara	0.262	15
Bhandara	0.172	16	Bhandara	0.778	16	Yavatmal	0.256	16
Nanded	0.167	17	Hingoli	0.775	17	Sangli	0.230	17
Nandurbar	0.163	18	Buldhana	0.768	18	Dhule	0.220	18
Aurangabad	0.160	19	Aurangabad	0.738	19	Kolhapur	0.217	19
Gondia	0.144	20	Solapur	0.683	20	Akola	0.212	20
Thane	0.122	21	Raigad	0.670	21	Jalgaon	0.191	21
Jalgaon	0.115	22	Chandrapur	0.670	22	Ahmadnagar	0.184	22
Dhule	0.114	23	Nasik	0.623	23	Solapur	0.182	23
Chandrapur	0.104	24	Yavatmal	0.605	24	Pune	0.174	24
Jalna	0.099	25	Gondia	0.605	25	Nanded	0.164	25
Latur	0.095	26	Akola	0.593	26	Buldhana	0.158	26
Nasik	0.085	27	Washim	0.575	27	Washim	0.153	27
Solapur	0.076	28	Jalna	0.563	28	Jalna	0.151	28
Osmanabad	0.071	29	Jalgaon	0.560	29	Latur	0.147	29
Yavatmal	0.060	30	Nanded	0.533	30	Parbhani	0.128	30
Hingoli	0.058	31	Dhule	0.490	31	Beed	0.118	31
Washim	0.055	32	Gadchiroli	0.428	32	Hingoli	0.115	32
Akola	0.015	33	Nandurbar	0.178	33	Aurangabad	0.115	33
Maharashtra	0.235		Maharashtra	0.723		Maharashtra	0.312	

Source: Authors' calculation

Notes: The score for Maharashtra is the average value of 33 districts considered above.

Latur, Nasik, Solapur, Osmanabad, Yavatmal, Hingoli, Washim and Akola are performing poorly in Maharashtra. All together, there are only 11 districts whose performances are better than the state average and remaining 22 districts whose performances are below the state average.

Similar conditions are also found in terms of number of rural hospitals per lakh rural population. It is clearly evident that only ten districts such as Sindhudurg, Ratnagiri, Gadchiroli, Nandurbar, Chandrapur, Gondia, Bhandara, Nagpur, Raigad and Thane have performed above the state average and five districts such as Sindhudurg, Ratnagiri, Gadchiroli, Nandurbar and Chandrapur are best performing districts with wide margin compared to other districts in Maharashtra. On the other hand, districts such as Latur, Parbhani, Beed, Hingoli and Aurangabad are worse performing and their scores are way below the state average.

The relative rankings of various districts in terms of institutional deliveries for rural areas are presented in column 5 of Table 5.2. It is clear that on an average; around 70% deliveries are done through technology-equipped medical facility under supervision of skilled medical staff in Maharashtra. Districts such as Solapur, Raigad, Chandrapur, Nasik, Yavatmal, Gondia, Akola, Washim, Jalna, Jalgaon, Nanded, Dhule, Gadchiroli and Nandurbar have recorded below state average. Out of above 14 districts, three districts such as Dhule, Gadchiroli and Nandurbar are worse performing.

Thus, it is clear that in terms of health infrastructure for rural areas, there are large disparities among districts in Maharashtra. Kolhapur, Sindhudurg, Ratnagiri, Satara, Wardha and Nagpur are best performing districts, while Nanded, Jalna, Dhule, Akola, Jalgaon and Washim are worse performing in Maharashtra.

## 5.4 Housing Amenities and Environment

There are two indicators considered for the study<sup>2</sup>: one related to housing amenities – percent households with drinking water facilities (HDWF) and other related to environmental aspects – percent households without latrine facilities (HLF). The relative rankings of districts on the above indicators are presented in Table 5.3. It is evident that districts such as Washim, Beed, Nandurbar, Nanded, Yavatmal, Gondia, Chandrapur and Gadchiroli have large numbers of households without access to safe drinking water. On the other hand, districts such as Kolhapur, Satara, Sangli, Jalgaon, Dhule, Pune and Sindhudurg are performing better in terms of providing safe drinking water to rural households. On the whole, there are only 13 districts whose performances are better than the state average and remaining 20 districts whose performances are below the state average.

<sup>2</sup> It is well documented that open defecation leads to the transmission of diseases and produces adverse health outcomes for nearby populations, especially children (Spears et al., 2013).



**Table 5.3: Rankings of Districts on Housing Amenities**

Districts	HDWF	Ranks	Districts	HLF	Ranks
Kolhapur	0.802	1	Sindhudurg	0.932	1
Satara	0.663	2	Nagpur	0.928	2
Sangli	0.640	3	Kolhapur	0.908	3
Jalgaon	0.637	4	Pune	0.897	4
Dhule	0.558	5	Satara	0.852	5
Pune	0.520	6	Ratnagiri	0.823	6
Sindhudurg	0.510	7	Thane	0.783	7
Wardha	0.486	8	Sangli	0.748	8
Amravati	0.461	9	Raigad	0.700	9
Nagpur	0.456	10	Bhandara	0.687	10
Ahmadnagar	0.416	11	Wardha	0.612	11
Nasik	0.352	12	Amravati	0.562	12
Solapur	0.349	13	Gondia	0.540	13
Raigad	0.338	14	Aurangabad	0.482	14
Buldhana	0.331	15	Nasik	0.447	15
Ratnagiri	0.330	16	Ahmadnagar	0.435	16
Aurangabad	0.328	17	Akola	0.435	17
Akola	0.328	18	Chandrapur	0.388	18
Latur	0.313	19	Solapur	0.355	19
Osmanabad	0.301	20	Latur	0.293	20
Thane	0.272	21	Jalna	0.275	21
Parbhani	0.219	22	Jalgaon	0.258	22
Jalna	0.211	23	Buldhana	0.255	23
Bhandara	0.205	24	Washim	0.230	24
Hingoli	0.203	25	Nanded	0.218	25
Washim	0.196	26	Hingoli	0.207	26
Beed	0.193	27	Dhule	0.187	27
Nandurbar	0.181	28	Yavatmal	0.183	28
Nanded	0.131	29	Parbhani	0.147	29
Yavatmal	0.131	30	Nandurbar	0.145	30
Gondia	0.121	31	Osmanabad	0.128	31
Chandrapur	0.101	32	Gadchiroli	0.117	32
Gadchiroli	0.018	33	Beed	0.085	33
Maharashtra	0.342		Maharashtra	0.462	

Source: Authors' calculation

Note: The score for Maharashtra is the average value of 33 districts considered above.

Another important indicator relating to environment is sewage and solid waste management practices within districts. Percentage of households without latrine facilities is considered as a proxy for the environmental aspects and the data is taken from the Census of India 2011, to highlight the latrine infrastructure at district level and percentage of population practicing open defecation. The relative positions of districts in terms of latrine facilities indicate that Dhule, Yavatmal, Parbhani, Nandurbar, Osmanabad, Gadchiroli and Beed have highest open defecation in Maharashtra. Therefore, these districts have to improve their efforts in terms of access to latrines and open defecation issues. On the other hand, districts such as Sindhudurg, Nagpur, Kolhapur, Pune, Satara, Ratnagiri, Thane, Sangli and Raigad have better access to latrines within the households.

## 5.5 Social Infrastructure Rankings of Districts

The district-level composite social infrastructure index for rural areas of Maharashtra is presented in Table 5.4 and Figure 5.1.

**Table 5.4: Rankings of Districts on Social Infrastructure Index (SII)**

Districts	Score	Rank	Districts	Score	Rank
Sindhudurg	2.30	1	Akola	1.30	18
Kolhapur	2.14	2	Beed	1.30	19
Satara	2.09	3	Solapur	1.27	20
Ratnagiri	1.88	4	Osmanabad	1.27	21
Nagpur	1.85	5	Latur	1.27	22
Wardha	1.84	6	Jalgaon	1.23	23
Sangli	1.71	7	Washim	1.22	24
Bhandara	1.65	8	Yavatmal	1.18	25
Amravati	1.65	9	Hingoli	1.16	26
Pune	1.64	10	Dhule	1.15	27
Gondia	1.52	11	Parbhani	1.15	28
Ahmadnagar	1.50	12	Nasik	1.12	29
Chandrapur	1.35	13	Thane	1.10	30
Raigad	1.35	14	Jalna	1.07	31
Buldhana	1.33	15	Nanded	1.03	32
Gadchiroli	1.32	16	Nandurbar	0.97	33
Aurangabad	1.31	17	Maharashtra	1.43	

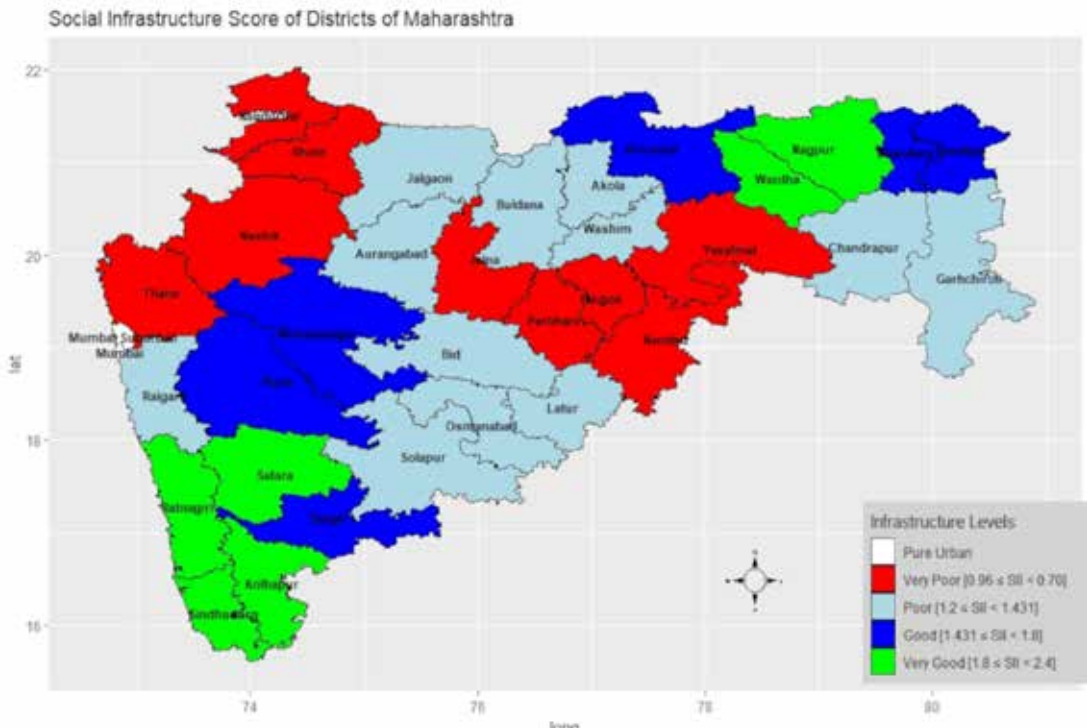
Source: Authors' calculation

Note: The score for Maharashtra is the average value of 33 districts considered above.

The relative analysis shows that districts such as Sindhudurg, Kolhapur, Satara, Ratnagiri, Nagpur, Wardha and Sangli are relatively better performing compared to other districts, subsequently classified as high performance districts. However, other districts like Yavatmal, Hingoli, Dhule, Parbhani, Nasik, Thane, Jalna, Nanded and Nandurbar have a relatively lower ranking, thus falling in the category of very poor performing districts. Bhandara, Amravati, Pune, Gondia and Ahmadnagar can be classified as good performing districts, and these districts are doing relatively better compared to the state average. Finally, districts such as Chandrapur, Raigad, Buldhana, Gadchiroli, Aurangabad, Akola and Beed are performing just below the state average and hence classified as poor performing districts. A better picture of the level of relative performance of districts compared to state average is ascertained by analyzing the dimension- and component-level scores of the Social Infrastructure Index, as presented in Table 5.5. District scores are divided into four performance groups, as shown on Figure 5.1.

- High Performance (very good) districts (Green Colour)
- Good Performance districts (Blue Colour)
- Poor Performance districts (Light Blue Colour)
- Very Poor Performance districts (Red Colour)

**Figure 5.1: Relative Rankings of Districts on Social Infrastructure**



Source: Authors' calculation

**Table 5.5: Social Infrastructure Index, Three Dimensions and Component-Level Scores**

Districts	Education			Health			Amenities		Overall
	RLR	SD	SST	BED	ID	HD	HDWF	HLF	
Ahmadnagar	0.68	0.30	0.91	0.28	0.78	0.18	0.42	0.44	1.50
Akola	0.89	0.23	0.77	0.01	0.59	0.21	0.33	0.44	1.30
Amravati	0.89	0.26	0.91	0.22	0.84	0.29	0.46	0.56	1.65
Aurangabad	0.55	0.19	0.89	0.16	0.74	0.12	0.33	0.48	1.31
Beed	0.61	0.33	0.97	0.19	0.94	0.12	0.19	0.08	1.30
Bhandara	0.83	0.34	0.96	0.17	0.78	0.40	0.20	0.69	1.65
Buldhana	0.78	0.21	0.86	0.19	0.77	0.16	0.33	0.26	1.33
Chandrapur	0.68	0.31	0.84	0.10	0.67	0.59	0.10	0.39	1.35
Dhule	0.45	0.23	0.88	0.11	0.49	0.22	0.56	0.19	1.15
Gadchiroli	0.61	0.54	0.73	0.38	0.43	0.77	0.02	0.12	1.32
Gondia	0.87	0.35	0.96	0.14	0.61	0.44	0.12	0.54	1.52
Hingoli	0.65	0.21	0.87	0.06	0.78	0.12	0.20	0.21	1.16
Jalgaon	0.63	0.17	0.80	0.11	0.56	0.19	0.64	0.26	1.23
Jalna	0.47	0.22	0.84	0.10	0.56	0.15	0.21	0.28	1.07
Kolhapur	0.75	0.25	0.93	0.92	0.90	0.22	0.80	0.91	2.14
Latur	0.63	0.23	0.79	0.10	0.89	0.15	0.31	0.29	1.27
Nagpur	0.82	0.19	0.87	0.43	0.88	0.38	0.46	0.93	1.85
Nanded	0.56	0.23	0.71	0.17	0.53	0.16	0.13	0.22	1.03
Nandurbar	0.27	0.25	0.86	0.16	0.18	0.64	0.18	0.15	0.97
Nasik	0.66	0.17	0.45	0.08	0.62	0.29	0.35	0.45	1.12
Osmanabad	0.68	0.25	0.90	0.07	0.82	0.30	0.30	0.13	1.27
Parbhani	0.51	0.19	0.84	0.19	0.85	0.13	0.22	0.15	1.15
Pune	0.78	0.15	0.74	0.27	0.83	0.17	0.52	0.90	1.64
Raigad	0.75	0.42	0.13	0.28	0.67	0.37	0.34	0.70	1.35
Ratnagiri	0.81	0.65	0.50	0.31	0.88	0.85	0.33	0.82	1.88
Sangli	0.78	0.29	0.65	0.46	0.80	0.23	0.64	0.75	1.71
Satara	0.82	0.39	0.95	0.69	0.92	0.26	0.66	0.85	2.09
Sindhudurg	0.94	0.80	0.73	0.48	1.00	0.89	0.51	0.93	2.30
Solapur	0.61	0.27	0.86	0.08	0.68	0.18	0.35	0.36	1.27
Thane	0.51	0.01	0.18	0.12	0.83	0.32	0.27	0.78	1.10
Wardha	0.89	0.35	0.79	0.59	0.88	0.31	0.49	0.61	1.84
Washim	0.79	0.26	0.94	0.06	0.58	0.15	0.20	0.23	1.22
Yavatmal	0.77	0.30	0.83	0.06	0.61	0.26	0.13	0.18	1.18
Maharashtra	0.70	0.29	0.78	0.23	0.72	0.31	0.34	0.46	1.43
C.V.	21.77	50.52	25.80	88.80	24.35	68.17	54.63	60.74	23.84

Source: Authors' calculation

Note: Colouring of the table is based on the level of performance (scores) on Social Infrastructure Index, its dimensions and components. Green signifies high performance; blue represents average; black represents moderately low; and red represents very low performance.

## 5.6 Region-wise Rankings of Districts

In order to identify laggard districts, in each agricultural division, the districts have been colored: black if its score is below the state average score or green if it is above the state average for each parameter as well as composite rank (Table 5.6)

**Table 5.6: Districts Rankings Within Region**

Social Infrastructure Index									
Districts	Education			Health			Amenities		Overall
	RLR	SD	SST	BED	HD	ID	HDWF	HLF	SII
Thane	0.512	0.015	0.184	0.122	0.315	0.828	0.272	0.783	1.101
Raigad	0.747	0.420	0.132	0.276	0.373	0.670	0.338	0.700	1.346
Ratnagiri	0.812	0.650	0.499	0.312	0.845	0.883	0.330	0.823	1.876
Sindhudurg	0.940	0.799	0.734	0.479	0.891	1.000	0.510	0.932	2.30
<b>Konkan Div.</b>	0.753	0.471	0.387	0.297	0.606	0.845	0.362	0.810	1.65
Nasik	0.657	0.171	0.451	0.085	0.291	0.623	0.352	0.447	1.124
Dhule	0.449	0.234	0.878	0.114	0.220	0.490	0.558	0.187	1.148
Nandurbar	0.268	0.254	0.857	0.163	0.636	0.178	0.181	0.145	0.967
Jalgaon	0.626	0.174	0.797	0.115	0.191	0.560	0.637	0.258	1.227
<b>Nashik Div.</b>	0.500	0.208	0.746	0.119	0.334	0.463	0.432	0.259	1.116
Ahmadnagar	0.684	0.297	0.911	0.279	0.184	0.780	0.416	0.435	1.500
Pune	0.782	0.153	0.738	0.266	0.174	0.833	0.520	0.897	1.640
Solapur	0.613	0.269	0.859	0.076	0.182	0.683	0.349	0.355	1.269
<b>Pune Div.</b>	0.693	0.240	0.836	0.207	0.180	0.765	0.428	0.562	1.469
Satara	0.819	0.386	0.948	0.690	0.262	0.918	0.663	0.852	2.087
Sangli	0.778	0.292	0.650	0.465	0.230	0.795	0.640	0.748	1.714
Kolhapur	0.752	0.247	0.934	0.918	0.217	0.903	0.802	0.908	2.138
<b>Kolhapur Div.</b>	0.783	0.308	0.844	0.691	0.236	0.872	0.702	0.836	1.979
Aurangabad	0.554	0.188	0.887	0.160	0.115	0.738	0.328	0.482	1.308
Jalna	0.472	0.223	0.839	0.099	0.151	0.563	0.211	0.275	1.074
Beed	0.612	0.326	0.972	0.193	0.118	0.938	0.193	0.085	1.300
<b>Aurangabad Div.</b>	0.546	0.245	0.899	0.151	0.128	0.746	0.244	0.281	1.227
Latur	0.633	0.235	0.789	0.095	0.147	0.888	0.313	0.293	1.266
Osmanabad	0.682	0.245	0.901	0.071	0.300	0.818	0.301	0.128	1.267
Nanded	0.562	0.226	0.706	0.167	0.164	0.533	0.131	0.218	1.028
Parbhani	0.507	0.190	0.836	0.186	0.128	0.845	0.219	0.147	1.147
Hingoli	0.648	0.209	0.868	0.058	0.115	0.775	0.203	0.207	1.164
<b>Latur Div.</b>	0.606	0.221	0.820	0.115	0.171	0.772	0.233	0.199	1.174
Buldhana	0.780	0.206	0.859	0.192	0.158	0.768	0.331	0.255	1.330
Akola	0.895	0.227	0.769	0.015	0.212	0.593	0.328	0.435	1.301
Washim	0.792	0.262	0.937	0.055	0.153	0.575	0.196	0.230	1.218
Amravati	0.892	0.259	0.907	0.216	0.293	0.843	0.461	0.562	1.651
Yavatmal	0.766	0.300	0.831	0.060	0.256	0.605	0.131	0.183	1.178

Social Infrastructure Index									
Districts	Education			Health			Amenities		Overall
	RLR	SD	SST	BED	HD	ID	HDWF	HLF	SII
<b>Amravati Div.</b>	0.825	0.251	0.861	0.107	0.214	0.677	0.289	0.333	1.335
Wardha	0.895	0.355	0.790	0.592	0.308	0.88	0.486	0.612	1.843
Nagpur	0.819	0.194	0.868	0.429	0.378	0.88	0.456	0.928	1.855
Bhandara	0.832	0.343	0.963	0.172	0.404	0.777	0.205	0.687	1.653
Gondia	0.866	0.352	0.963	0.144	0.445	0.605	0.121	0.540	1.523
Chandrapur	0.684	0.310	0.839	0.104	0.588	0.67	0.101	0.388	1.355
Gadchiroli	0.607	0.544	0.731	0.377	0.775	0.4275	0.018	0.117	1.315
<b>Nagpur Div.</b>	0.784	0.350	0.859	0.303	0.483	0.706	0.231	0.545	1.59
<b>Maharashtra</b>	<b>0.70</b>	<b>0.29</b>	<b>0.78</b>	<b>0.23</b>	<b>0.31</b>	<b>0.72</b>	<b>0.34</b>	<b>0.46</b>	<b>1.43</b>
C.V.	17.7	30.7	21.2	78.5	58.5	17.3	43.7	52.2	20.1

Source: Authors' calculation

Note: Colouring of the table is based on the level of performance (individual scores against state average). Green signifies above the state average and black represents below the state average.

C.V. - Coefficient of Variation

Based on the above criteria, the number of districts is divided into two groups: (1) below the state average and (2) above the state average, in each division. Districts having scores below the state average in each division for each indicator are presented in Table 5.7. It is clear that the laggard districts are mainly concentrated in Nashik, Latur and Aurangabad. Kolhapur, Pune and Konkan division are best performing in the state of Maharashtra.

**Table 5.7: Number of Districts with Score below the State Average Score**

Division	Total Districts	Education			Health			Amenities		Overall
		RLR	SD	SST	BED	HD	ID	HDWF	HLF	SII
Konkan	4	1	2	4	1	0	1	2	0	2 (50)
Nashik	4	4	4	1	4	3	4	1	3	4 (100)
Pune	3	2	2	1	1	3	1	0	2	1 (33)
Kolhapur	3	0	1	1	0	3	0	0	0	0 (0)
Aurangabad	3	3	2	0	3	3	1	3	2	3 (100)
Latur	5	5	5	1	5	5	1	5	5	5 (100)
Amravati	5	0	4	0	5	5	3	4	4	3 (60)
Nagpur	6	2	1	1	3	1	3	4	2	2 (33)

Source: Authors' calculation

Notes: Figures in the bracket indicate percent when the score is below the state average.

Further classification of districts has been done region-wise based on administration divisions: Vidarbha, Marathwada, Khandesh, Western Maharashtra and Konkan. The number of districts whose score is below the state average in each division for each indicator is presented in Table 5.8. It is clear that most of the laggard districts are mainly concentrated in Marathwada and Vidarbha regions.

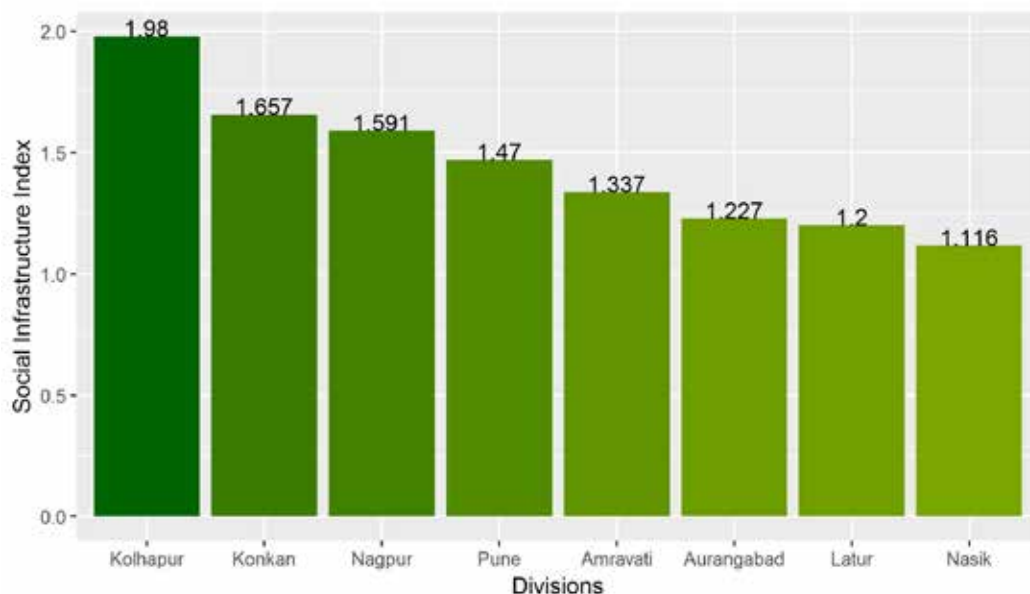
**Table 5.8: Number of Districts with Score below the State Average (Geographical Point of View)**

Division	Total Districts	Education			Health			Amenities		Overall SII
		RLR	SD	SST	BED	HP	ID	HDWF	HLF	
Vidarbha	11	2	5	2	8	6	6	8	6	6 (55)
Marathwada	8	8	7	1	8	8	2	8	7	8 (100)
Khandesh	5	5	4	1	4	4	4	1	5	4 (80)
Western Maharashtra	5	1	3	2	1	5	1	0	1	1 (20)
Konkan	4	1	1	3	2	2	2	3	2	2 (50)

Source: Authors' calculation

Note: Figures in the bracket indicate percentage of districts with score below the state average.

The social infrastructure index for the eight divisions is shown in Figure 5.2. It is evident that Kolhapur is the top division in Maharashtra followed by Konkan and Nagpur in terms of Social Infrastructure Index. Nasik, Latur and Aurangabad are laggard divisions as most of the laggard districts are concentrated in these divisions.

**Figure 5.2: The Barplot of Social Infrastructure Index of Divisions of Maharashtra**

Source: Authors' calculation

For the purpose of comparing the social infrastructure index of eight divisions of Maharashtra, a one-way ANOVA technique was applied and the results are shown in Table 5.9

The hypothesis to be tested:

$H_0 : SII_{konkan} = SII_{nasik} = SII_{pune} = SII_{kolhapur} = SII_{aurangabad} = SII_{latur} = SII_{amravati} = SII_{nagpur}$   
against

$H_1$ : Not all SII are equal

SII stands for Social Infrastructure Index

**Table 5.9: One-way ANOVA for Social Infrastructure Index among Divisions**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.140	7	0.3058	4.798	.000
Within Groups	1.593	25	0.0637		
Total	3.733	32			

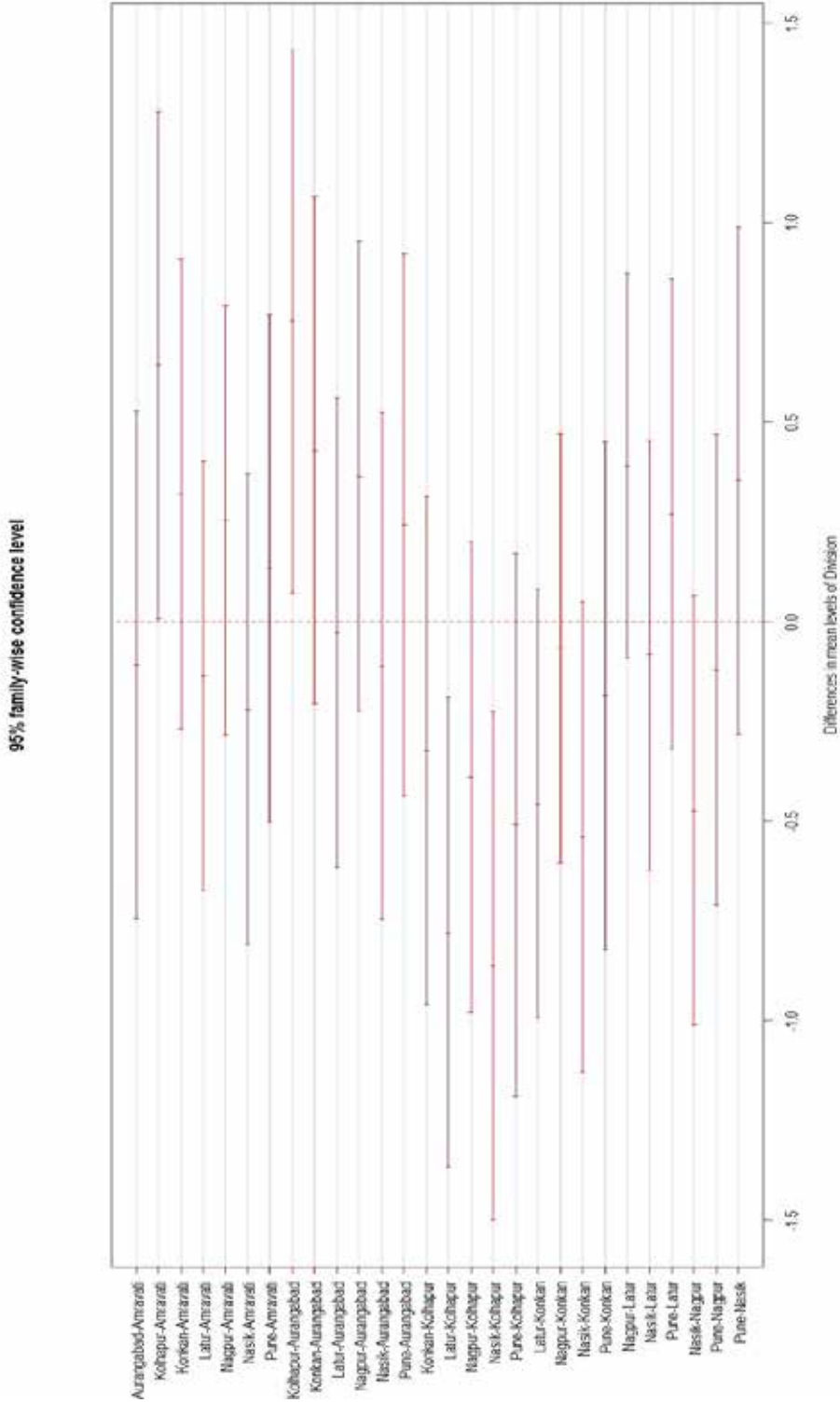
Source: Authors' estimation

The F-test results indicate that the eight agri-divisions of the State are not performing at par in terms of social infrastructure, which prompts for further post-hoc analysis to identify the most backward regions and inter-division comparison. Tukey's post-hoc analysis is shown graphically in Figure 5.3.

Thus, it is evident from the Figures 5.2 and 5.3 that Kolhapur, Konkan and Nagpur divisions are performing well in terms of social infrastructure, followed by Pune division; Amravati, Aurangabad, Latur and Nasik divisions are lagging behind other divisions of the State. The above analysis suggests that there are significant regional disparities among districts and divisions in Maharashtra.



Figure 5.3: Tukey Post-hoc Plot of Infrastructure Index of Agri-divisions



Source: Authors' estimation

## 5.7 Conclusion

Social infrastructure – education, health, housing and amenities – is vital for developing human capital. It can play a significant role in poverty alleviation and contributing to a healthy and productive life. This chapter has provided relative rankings for 33 districts on social infrastructure for the state of Maharashtra.

The rankings of the districts indicate that there exists sizeable disparity in terms of performances among districts in Maharashtra. Districts like Sindhudurg, Kolhapur, Ratnagiri, Satara, Nagpur, Sangli, Wardha and Bhandara are well developed and best performing while Nanded, Aurangabad, Thane, Parbhani, Dhule, Jalna, Latur and Nandurbar are backward and worse performing districts in Maharashtra. Similarly, division-wise ranking indicates that most of the backward or laggard districts are in Nasik, Latur and Aurangabad. A one-way ANOVA analysis indicates that the eight agri-divisions of the State are not performing at par in terms of social infrastructure. In this scenario, Maharashtra requires higher and effective investments in social infrastructure such as education, health, housing amenities and environment in backward districts, in order to achieve balanced regional development. This is also vital for achieving the targets toward Sustainable Development Goals (SDGs), 2030.

# Rural Development Infrastructure Index

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## Chapter- 6

### Institutional Infrastructure Index

## 6.1 Introduction

Institutional infrastructure is crucial for effective functioning and monitoring of both physical and social infrastructures. Institutions are drivers of socio-economic development for a country. Research shows that institutions can be a major source of growth; effective institutions aid investment in physical and human capital, in research and development, and in technology (Acemoglu et al., 2005). Institutions also have an important redistributive role to play in the economy, ensuring that resources are suitably and judiciously allocated, keeping equity and sustainability in mind. Well-functioning institutions are a signal of a well-managed economy, enabling governments and businesses to borrow from the markets at more competitive rates of interest. In turn, higher growth and lower borrowing costs give governments the resources to spend on social needs as well as on investment in infrastructure, health and education.

There is a wide range of institutions that support societies, incorporating structures that defend property rights and the legal framework, including the court system, the political system and the framework within which government operates. There is another set of institutions which regulates economic and financial stability, those that provide social insurance and safeguard security (including the police and military), and yet another range of economic, political, judicial, cultural and other institutions, with all of them playing a vital role for the development of the economy.

The objective of this chapter is to rank districts based on institutional infrastructure; therefore, the study only considers economic institutional infrastructure such as financial institutions (banks, SHGs, primary cooperative societies (PACs), post offices, insurance), agriculture supporting institutions (agricultural extension staff, agribusiness clinics, soil testing labs) and marketing institutions (farmer groups/marketing cooperatives/FPC). These establishments not only provide supportive infrastructure for rural areas but also necessary agricultural finance, insurance and inputs, which are vital for the development of rural areas. Therefore, under the present study, these institutions fall under three main heads: (1) institutions that facilitate secure lending, (2) institutions that improve information dissemination and (3) institutions that reduce risk.

## 6.2 Financial Institutions

Four dimensions of financial infrastructure are considered for the study and they include: i) number of bank branches per lakh rural population (BANK); ii) percentage of households with access to banking facilities (HBF); iii) number of post offices per lakh of rural population (PO) and iv) number of SHGs per lakh rural population. Rankings of districts on these four dimensions of financial institutions are presented in Table 6.1 It is evident that in terms of bank density, seven districts such as Sindhudurg, Jalna, Satara, Ratnagiri, Sangli, Nagpur and Raigad are performing much better than the state average. However, quite a large number of districts (12 districts) such

as Dhule, Wardha, Gondia, Yavatmal, Buldhana, Jalgaon, Nanded, Beed, Thane, Washim, Hingoli and Nandurbar are performing very poorly in terms of bank density. Other districts such as Pune, Ahmadnagar, Kolhapur, Solapur, Akola, Bhandara, Aurangabad and Chandrapur are performing marginally well compared to the state average.

**Table 6.1: Rankings of Districts with Respect to Financial Institutions**

Districts	Bank	Rank	Districts	HBF	Rank	Districts	PO	Ranks	Districts	SHGs	Rank
Sindhudurg	0.833	1	Sangli	0.745	1	Sindhudurg	0.974	1	Wardha	0.963	1
Jalna	0.489	2	Satara	0.726	2	Ratnagiri	0.961	2	Gadchiroli	0.744	2
Satara	0.477	3	Kolhapur	0.696	3	Nandurbar	0.611	3	Bhandara	0.663	3
Ratnagiri	0.460	4	Gadchiroli	0.691	4	Satara	0.509	4	Sindhudurg	0.511	4
Sangli	0.448	5	Pune	0.650	5	Amravati	0.440	5	Gondia	0.460	5
Nagpur	0.437	6	Solapur	0.640	6	Chandrapur	0.424	6	Jalna	0.400	6
Raigad	0.416	7	Gondia	0.625	7	Raigad	0.387	7	Ratnagiri	0.396	7
Pune	0.385	8	Osmanabad	0.606	8	Osmanabad	0.378	8	Satara	0.390	8
Ahmadnagar	0.353	9	Ahmadnagar	0.600	9	Kolhapur	0.378	9	Yavatmal	0.376	9
Kolhapur	0.340	10	Jalna	0.598	10	Akola	0.377	10	Chandrapur	0.354	10
Solapur	0.334	11	Beed	0.597	11	Gadchiroli	0.373	11	Nandurbar	0.349	11
Akola	0.294	12	Hingoli	0.592	12	Wardha	0.366	12	Kolhapur	0.313	12
Bhandara	0.283	13	Wardha	0.581	13	Sangli	0.359	13	Nagpur	0.298	13
Aurangabad	0.279	14	Chandrapur	0.559	14	Nanded	0.347	14	Raigad	0.263	14
Chandrapur	0.278	15	Latur	0.548	15	Nagpur	0.342	15	Sangli	0.262	15
Nasik	0.264	16	Washim	0.541	16	Ahmadnagar	0.338	16	Amravati	0.253	16
Osmanabad	0.255	17	Nagpur	0.541	17	Jalgaon	0.334	17	Osmanabad	0.247	17
Parbhani	0.250	18	Parbhani	0.532	18	Nasik	0.331	18	Solapur	0.225	18
Latur	0.231	19	Aurangabad	0.526	19	Pune	0.329	19	Pune	0.196	19
Gadchiroli	0.224	20	Buldhana	0.511	20	Solapur	0.319	20	Latur	0.146	20
Amravati	0.212	21	Sindhudurg	0.506	21	Buldhana	0.315	21	Hingoli	0.139	21
Dhule	0.194	22	Nasik	0.470	22	Washim	0.315	22	Washim	0.116	22
Wardha	0.193	23	Bhandara	0.468	23	Yavatmal	0.307	23	Parbhani	0.111	23
Gondia	0.186	24	Yavatmal	0.459	24	Aurangabad	0.289	24	Beed	0.110	24
Yavatmal	0.170	25	Akola	0.456	25	Beed	0.289	25	Akola	0.084	25
Buldhana	0.142	26	Raigad	0.435	26	Latur	0.288	26	Ahmadnagar	0.084	26
Jalgaon	0.128	27	Ratnagiri	0.433	27	Gondia	0.283	27	Nasik	0.077	27
Nanded	0.121	28	Thane	0.430	28	Parbhani	0.268	28	Buldhana	0.075	28
Beed	0.117	29	Amravati	0.397	29	Bhandara	0.260	29	Thane	0.075	29
Thane	0.104	30	Jalgaon	0.324	30	Thane	0.248	30	Aurangabad	0.065	30
Washim	0.045	31	Nanded	0.299	31	Hingoli	0.200	31	Dhule	0.062	31
Hingoli	0.039	32	Dhule	0.232	32	Jalna	0.191	32	Jalgaon	0.058	32
Nandurbar	0.025	33	Nandurbar	0.117	33	Dhule	0.006	33	Nanded	0.021	33
<b>Maharashtra</b>	<b>0.27</b>		<b>Maharashtra</b>	<b>0.519</b>		<b>Maharashtra</b>	<b>0.367</b>		<b>Maharashtra</b>	<b>0.269</b>	

Source: Authors' calculation

Note: The score for Maharashtra is the average value of 33 districts considered above.

In terms of access to banks by rural households, it is evident that the same sets of districts are dominating the top ten positions, except districts like Gadchiroli, Osmanabad and Ahmadnagar. Notable exceptions are: Sindhudurg, Raigad and Ratnagiri. Sangli tops the list and Nandurbar is ranked lower than Maharashtra. More importantly, the performance of 19 districts is better than the state average, and only 14 districts are performing below the state average. This study clearly shows significant intra-state variations in financial infrastructure in Maharashtra. The relative rankings in terms of number of SHGs shows that districts such as Wardha, Gadchiroli, Bhandara, Sindhudurg, Gondia, Jalna, Ratnagiri, Satara, Yavatmal and Chandrapur are relatively better performing compared to other districts, subsequently classified as high performing (very good) districts. However, districts such as Latur, Hingoli, Washim, Parbhani, Beed, Akola, Ahmadnagar, Nasik, Buldhana, Thane, Aurangabad, Dhule, Jalgaon and Nanded have relatively low ranking, falling under very poor performing districts. There exists a wide gap between top ten districts and bottom ten districts, indicating high disparities among districts in Maharashtra. Nandurbar, Kolhapur and Nagpur are classified as goodperforming districts and these districts are doing relatively better compared to the state average. Finally, districts such as Raigad, Sangli, Amravati, Osmanabad and Solapur are performing just below the state average and hence classified as poor performing districts.

### 6.3 Agriculture Supporting Institutions

Agriculture supporting institutions have three indicators namely: PACs, Ground Level Credit Outlets (including agribusiness clinics and farmer groups/marketing cooperatives/FPC) density and agricultural extension staff. The relative rankings of districts are presented in Table 6.2. The relative rankings of districts in terms of number of PACs shows that districts such as Kolhapur, Wardha, Hingoli, Washim, Solapur, Nanded, Bhandara, Nagpur, Chandrapur and Satara occupy the high performing (very good) districts in Maharashtra whereas Nasik, Dhule, Ratnagiri, Buldhana, Yavatmal, Gadchiroli, Nandurbar, Thane and Raigad are the very poor performing districts. The relative rankings in terms of credit outlet indicates that Sindhudurg, Solapur, Sangli, Kolhapur, Nagpur, Pune, Ratnagiri, Ahmadnagar, Satara and Osmanabad are leading districts in Maharashtra. While the state average score is 0.25, only 13 districts have outperformed the state average with the remaining 20 districts having underperformed compared to the state average. This clearly indicates that there exists lopsided development as far as credit outlets are concerned.

**Table 6.2: Rankings of Districts on Agriculture Supporting Institutions**

Districts	PACs	Rank	Districts	Credit	Rank	Districts	EXTCAP	Rank
Kolhapur	0.874	1	Sindhudurg	0.668	1	Sindhudurg	0.799	1
Solapur	0.518	2	Solapur	0.579	2	Raigad	0.697	2
Washim	0.507	3	Sangli	0.516	3	Ratnagiri	0.554	3
Hingoli	0.485	4	Kolhapur	0.495	4	Gadchiroli	0.433	4
Nagpur	0.464	5	Nagpur	0.475	5	Satara	0.379	5
Nanded	0.461	6	Pune	0.413	6	Gondia	0.349	6
Satara	0.457	7	Ratnagiri	0.398	7	Nasik	0.275	7
Wardha	0.453	8	Ahmadnagar	0.396	8	Kolhapur	0.227	8
Ahmadnagar	0.445	9	Satara	0.393	9	Thane	0.200	9
Bhandara	0.444	10	Osmanabad	0.381	10	Pune	0.197	10
Akola	0.435	11	Raigad	0.302	11	Nanded	0.192	11
Pune	0.430	12	Akola	0.277	12	Bhandara	0.189	12
Sangli	0.418	13	Amravati	0.264	13	Solapur	0.188	13
Beed	0.407	14	Jalna	0.201	14	Chandrapur	0.173	14
Jalna	0.403	15	Wardha	0.198	15	Wardha	0.167	15
Parbhani	0.402	16	Bhandara	0.195	16	Buldhana	0.161	16
Osmanabad	0.389	17	Parbhani	0.183	17	Latur	0.157	17
Aurangabad	0.377	18	Aurangabad	0.180	18	Nagpur	0.156	18
Amravati	0.375	19	Dhule	0.173	19	Amravati	0.150	19
Latur	0.361	20	Chandrapur	0.163	20	Nandurbar	0.146	20
Sindhudurg	0.341	21	Nasik	0.152	21	Washim	0.129	21
Jalgaon	0.338	22	Latur	0.149	22	Osmanabad	0.120	22
Gondia	0.333	23	Jalgaon	0.149	23	Yavatmal	0.120	23
Nasik	0.331	24	Beed	0.137	24	Sangli	0.115	24
Dhule	0.305	25	Buldhana	0.131	25	Akola	0.098	25
Buldhana	0.304	26	Yavatmal	0.124	26	Jalgaon	0.060	26
Chandrapur	0.302	27	Gondia	0.119	27	Dhule	0.058	27
Yavatmal	0.298	28	Washim	0.111	28	Aurangabad	0.055	28
Ratnagiri	0.295	29	Hingoli	0.100	29	Parbhani	0.038	29
Gadchiroli	0.288	30	Gadchiroli	0.099	30	Ahmadnagar	0.036	30
Nandurbar	0.162	31	Nanded	0.095	31	Beed	0.032	31
Thane	0.148	32	Thane	0.054	32	Jalna	0.020	32
Raigad	0.037	33	Nandurbar	0.037	33	Hingoli	0.009	33
Maharashtra	0.380		Maharashtra	0.251		Maharashtra	0.202	

Source: Authors' calculation

Notes: The score for Maharashtra is the average value of 33 districts considered above.

Finally, the relative rankings of per capita agricultural extension staff are presented in the last column of Table 6.2. Comparative rankings of districts indicate that only six districts - Sindhudurg, Raigad, Ratnagiri, Gadchiroli, Satara and Gondia are high performing (very good) districts. Nasik and Kolhapur are two other districts in the category of good performing districts, doing moderately better compared to the state average. However, large number of districts like Nandurbar, Washim, Osmanabad, Yavatmal, Sangli, Akola, Jalgaon, Dhule, Aurangabad, Parbhani, Ahmadnagar, Beed, Jalna and Hingoli have relatively low ranking, falling under the very poor performing districts category.

## 6.4 Crop Insurance and Composite Index

The relative rankings of districts with respect to crop insurance (Rabi) and composite index are presented in Tables 6.3 and 6.4. It is evident that some of the laggard districts like Latur, Buldhana, Osmanabad, Gadchiroli, Nanded, Beed, Washim and Akola have better crop insurance. On the other hand, best performing districts like Kolhapur, Nagpur, Ratnagiri, Sangli and Sindhudurg have lowest crop insurance coverage.

**Table 6.3: Rankings of Districts on Crop Insurance**

Districts	INS	Rank	Districts	INS	Rank
Wardha	0.315	1	Amravati	0.027	18
Latur	0.217	2	Yavatmal	0.023	19
Buldhana	0.217	3	Nandurbar	0.022	20
Satara	0.084	4	Kolhapur	0.017	21
Hingoli	0.074	5	Nagpur	0.017	22
Osmanabad	0.070	6	Aurangabad	0.014	23
Gadchiroli	0.065	7	Dhule	0.009	24
Nanded	0.054	8	Ratnagiri	0.008	25
Beed	0.053	9	Raigad	0.007	26
Washim	0.051	10	Chandrapur	0.007	27
Akola	0.048	11	Thane	0.006	28
Parbhani	0.046	12	Sangli	0.006	29
Jalna	0.043	13	Solapur	0.006	30
Bhandara	0.034	14	Nasik	0.005	31
Gondia	0.031	15	Jalgaon	0.003	32
Pune	0.031	16	Sindhudurg	0.001	33
Ahmadnagar	0.029	17	Maharashtra	0.049	

Source: Authors' calculation

Notes: The score for Maharashtra is the average value of 33 districts considered above.



### 6.4.1 Institutional Infrastructure Index

The district-level Composite Institutional Infrastructure Index for rural areas of Maharashtra is presented in Table 6.4 and Figure 6.1. The relative analysis shows that districts such as Sindhudurg, Kolhapur, Ratnagiri, Satara, Sangli and Solapur are relatively better performing compared to other districts, therefore, classified as high performing (very good) districts. However, districts like Beed, Buldhana, Nanded, Hingoli, Jalgaon, Nandurbar, Thane and Dhule are relatively lowest in ranking, falling under very poor performing districts. Districts like Wardha, Raigad, Gadchiroli, Osmanabad, Ahmadnagar, Bhandara, Jalna and Chandrapur are classified as good performing districts, doing moderately better compared to the state average. Finally, Akola, Amravati, Gondia, Nasik, Aurangabad and Parbhani are poor performing districts (moderately below the state average).

**Table 6.4: Institutional Infrastructure Index (III)**

	III	Rank	Districts	III	Rank
Sindhudurg	1.972	1	Amravati	0.886	18
Kolhapur	1.463	2	Gondia	0.876	19
Ratnagiri	1.432	3	Nasik	0.784	20
Satara	1.386	4	Aurangabad	0.767	21
Sangli	1.261	5	Parbhani	0.764	22
Solapur	1.232	6	Latur	0.756	23
Nagpur	1.196	7	Yavatmal	0.703	24
Pune	1.130	8	Washim	0.702	25
Wardha	1.095	9	Beed	0.690	26
Raigad	1.029	10	Buldhana	0.648	27
Gadchiroli	1.018	11	Nanded	0.639	28
Osmanabad	1.005	12	Hingoli	0.632	29
Ahmadnagar	1.003	13	Jalgaon	0.580	30
Bhandara	0.975	14	Nandurbar	0.520	31
Jalna	0.969	15	Thane	0.468	32
Chandrapur	0.966	16	Dhule	0.468	33
Akola	0.887	17	Maharashtra	0.937	

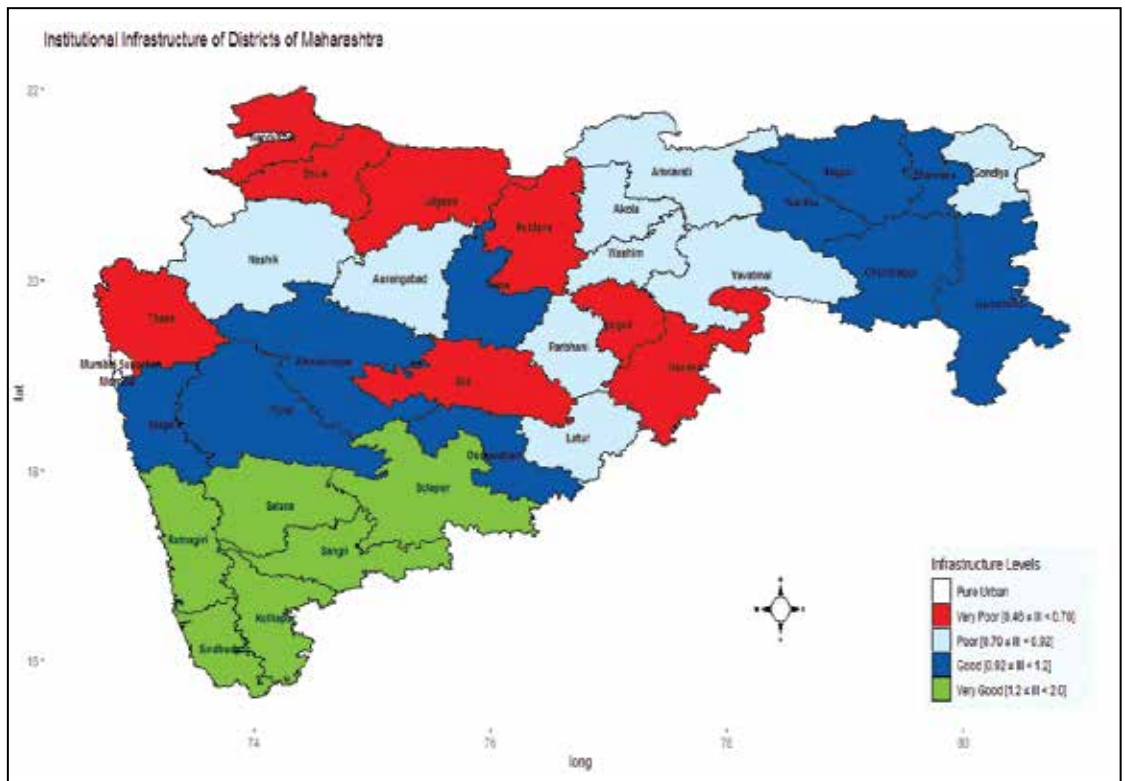
Source: Authors' calculation

Notes: The score for Maharashtra is the average value of 33 districts considered above.

A better picture of the level of relative performance of districts compared to state average is ascertained by analyzing the dimension- and component-level scores of the Institutional Infrastructure Index, as presented in Table 6.5. District scores are divided into four performance groups, as shown on Figure 6.1.

- High Performance (very good) districts (Green Colour)
- Good Performance districts (Blue Colour)
- Poor Performance districts (Light Blue Colour)
- Very Poor Performance districts (Red Colour)

**Figure 6.1: Relative Performance of Districts on Institutional Infrastructure Index (III)**



Source: Authors' own

**Table 6.5: Institutional Infrastructure Index, Three Dimensions and Component-level Scores**

Districts	Financial Institutions			Agriculture Supporting Institutions				Crop Insurance	III
	BANK	HBF	PO	SHG	PACs	CREDIT	EXTCAP	INS	III
Ahmadnagar	0.353	0.600	0.338	0.084	0.445	0.396	0.141	0.029	1.00
Akola	0.294	0.456	0.377	0.084	0.435	0.277	0.295	0.048	0.89
Amravati	0.212	0.397	0.440	0.253	0.375	0.264	0.275	0.027	0.89
Aurangabad	0.279	0.526	0.289	0.065	0.377	0.180	0.243	0.014	0.77
Beed	0.117	0.597	0.289	0.110	0.407	0.137	0.125	0.053	0.69
Bhandara	0.283	0.468	0.260	0.663	0.444	0.195	0.375	0.034	0.98
Buldhana	0.142	0.511	0.315	0.075	0.304	0.131	0.325	0.217	0.65
Chandrapur	0.278	0.559	0.424	0.354	0.302	0.163	0.244	0.007	0.97
Dhule	0.194	0.232	0.006	0.062	0.305	0.173	0.137	0.009	0.47
Gadchiroli	0.224	0.691	0.373	0.744	0.288	0.099	0.585	0.065	1.02
Gondia	0.186	0.625	0.283	0.460	0.333	0.119	0.545	0.031	0.88
Hingoli	0.039	0.592	0.200	0.139	0.485	0.100	0.203	0.074	0.63
Jalgaon	0.128	0.324	0.334	0.058	0.338	0.149	0.175	0.003	0.58
Jalna	0.489	0.598	0.191	0.400	0.403	0.201	0.162	0.043	0.97
Kolhapur	0.340	0.696	0.378	0.313	0.874	0.495	0.402	0.017	1.46
Latur	0.231	0.548	0.288	0.146	0.361	0.149	0.296	0.217	0.76
Nagpur	0.437	0.541	0.342	0.298	0.464	0.475	0.227	0.017	1.20
Nanded	0.121	0.299	0.347	0.021	0.461	0.095	0.291	0.054	0.64
Nandurbar	0.025	0.117	0.611	0.349	0.162	0.037	0.240	0.022	0.52
Nasik	0.264	0.470	0.331	0.077	0.331	0.152	0.352	0.005	0.78
Osmanabad	0.255	0.606	0.378	0.247	0.389	0.381	0.438	0.070	1.01
Parbhani	0.250	0.532	0.268	0.111	0.402	0.183	0.247	0.046	0.76
Pune	0.385	0.650	0.329	0.196	0.430	0.413	0.330	0.031	1.13
Raigad	0.416	0.435	0.387	0.263	0.037	0.302	0.832	0.007	1.03
Ratnagiri	0.460	0.433	0.961	0.396	0.295	0.398	0.581	0.008	1.43
Sangli	0.448	0.745	0.359	0.262	0.418	0.516	0.222	0.006	1.26
Satara	0.477	0.726	0.509	0.390	0.457	0.393	0.526	0.084	1.39
Sindhudurg	0.833	0.506	0.974	0.511	0.341	0.668	0.939	0.001	1.97
Solapur	0.334	0.640	0.319	0.225	0.518	0.579	0.256	0.006	1.23
Thane	0.104	0.430	0.248	0.075	0.148	0.054	0.211	0.006	0.47
Wardha	0.193	0.581	0.366	0.963	0.453	0.198	0.281	0.315	1.10
Washim	0.045	0.541	0.315	0.116	0.507	0.111	0.280	0.051	0.70
Yavatmal	0.170	0.459	0.307	0.376	0.298	0.124	0.179	0.023	0.70

	Financial Institutions			Agriculture Supporting Institutions				Crop Insurance	III
Districts	BANK	HBF	PO	SHG	PACs	CREDIT	EXTCAP	INS	III
Maharashtra	0.273	0.519	0.368	0.269	0.381	0.252	0.332	0.050	0.937
C.V.	60.23	26.76	49.89	80.8	35.88	65.4	56.93	140.5	35.6

Source: Authors' calculation

Note: Colouring of the table is based on the level of performance (scores) on Institutional Infrastructure Index, its dimensions and components. Green signifies high performance; blue represents average; black represents moderately low and red represents very low performance.

C.V. - Coefficient of Variation

## 6.5 Region-wise Rankings of Districts

In order to identify laggard districts, total 33 districts are classified into 8 agricultural divisions. They are Konkan, Nashik, Pune, Kolhapur, Aurangabad, Latur, Amravati and Nagpur division. Nagpur division has highest number of districts (six) and Nasik, Pune, and Kolhapur have minimum of three districts. Each district has been coloured black if its score is below the state average or green if its score is above the state average for each parameter as well as composite rank (Table 6.6)

**Table 6.6: Rankings of Districts within the Region**

Districts	Financial Institution			Agriculture Supporting Institutions				Crop Insurance	III
	BANK	HBF	PO	SHG	PACs	CREDIT	EXTCAP	INS	Overall
Thane	0.104	0.430	0.248	0.075	0.153	0.054	0.200	0.006	0.469
Raigad	0.416	0.435	0.387	0.263	0.007	0.302	0.697	0.007	1.029
Ratnagiri	0.460	0.433	0.961	0.396	0.455	0.398	0.554	0.008	1.433
Sindhudurg	0.833	0.506	0.974	0.511	0.511	0.668	0.799	0.001	1.973
<b>Konkan Div.</b>	0.453	0.451	0.643	0.311	0.281	0.355	0.562	0.006	1.226
Nasik	0.264	0.470	0.331	0.077	0.488	0.152	0.275	0.005	0.785
Dhule	0.194	0.232	0.006	0.062	0.468	0.173	0.058	0.009	0.468
Nandurbar	0.025	0.117	0.611	0.349	0.296	0.037	0.146	0.022	0.520
Jalgaon	0.128	0.324	0.334	0.058	0.510	0.149	0.060	0.003	0.581
<b>Nasik Div.</b>	0.153	0.286	0.320	0.136	0.441	0.128	0.135	0.010	0.588
Ahmadnagar	0.353	0.600	0.338	0.084	0.663	0.396	0.036	0.029	1.004
Pune	0.385	0.650	0.329	0.196	0.669	0.413	0.197	0.031	1.131
Solapur	0.334	0.640	0.319	0.225	0.775	0.579	0.188	0.006	1.233
<b>Pune Div.</b>	0.357	0.630	0.329	0.169	0.702	0.463	0.140	0.022	1.122
Satara	0.477	0.726	0.509	0.390	0.724	0.393	0.379	0.084	1.387
Sangli	0.448	0.745	0.359	0.262	0.650	0.516	0.115	0.006	1.261

Districts	Financial Institution			Agriculture Supporting Institutions				Crop Insurance	III
	BANK	HBF	PO	SHG	PACs	CREDIT	EXTCAP	INS	Overall
Kolhapur	0.340	0.696	0.378	0.313	1.518	0.495	0.227	0.017	1.464
<b>Kolhapur Div.</b>	0.422	0.723	0.415	0.322	0.964	0.468	0.240	0.036	1.371
Aurangabad	0.279	0.526	0.289	0.065	0.601	0.180	0.055	0.014	0.768
Jalna	0.489	0.598	0.191	0.400	0.643	0.201	0.020	0.043	0.970
Beed	0.117	0.597	0.289	0.110	0.660	0.137	0.032	0.053	0.691
<b>Aurangabad Div.</b>	0.295	0.574	0.257	0.192	0.635	0.172	0.035	0.037	0.810
Latur	0.231	0.548	0.288	0.146	0.547	0.149	0.157	0.217	0.757
Osmanabad	0.255	0.606	0.378	0.247	0.604	0.381	0.120	0.070	1.005
Nanded	0.121	0.299	0.347	0.021	0.752	0.095	0.192	0.054	0.640
Parbhani	0.250	0.532	0.268	0.111	0.648	0.183	0.038	0.046	0.764
Hingoli	0.039	0.592	0.200	0.139	0.826	0.100	0.009	0.074	0.632
<b>Latur Div.</b>	0.179	0.516	0.296	0.133	0.675	0.182	0.103	0.092	0.760
Buldhana	0.142	0.511	0.315	0.075	0.449	0.131	0.161	0.217	0.649
Akola	0.294	0.456	0.377	0.084	0.694	0.277	0.098	0.048	0.887
Washim	0.045	0.541	0.315	0.116	0.825	0.111	0.129	0.051	0.703
Amravati	0.212	0.397	0.440	0.253	0.667	0.264	0.150	0.027	0.887
Yavatmal	0.170	0.459	0.307	0.376	0.434	0.124	0.120	0.023	0.704
<b>Amravati Div.</b>	0.173	0.473	0.351	0.181	0.614	0.181	0.132	0.073	0.766
Wardha	0.193	0.581	0.366	0.963	0.892	0.198	0.167	0.315	1.095
Nagpur	0.437	0.541	0.342	0.298	0.740	0.475	0.156	0.017	1.196
Bhandara	0.283	0.468	0.260	0.663	0.743	0.195	0.189	0.034	0.976
Gondia	0.186	0.625	0.283	0.460	0.500	0.119	0.349	0.031	0.877
Chandrapur	0.278	0.559	0.424	0.354	0.737	0.163	0.173	0.007	0.967
Gadchiroli	0.224	0.691	0.373	0.744	0.428	0.099	0.433	0.065	1.019
<b>Nagpur Div.</b>	0.267	0.577	0.341	0.580	0.673	0.208	0.245	0.078	1.022
<b>Maharashtra</b>	<b>0.27</b>	<b>0.52</b>	<b>0.37</b>	<b>0.27</b>	<b>0.61</b>	<b>0.25</b>	<b>0.20</b>	<b>0.05</b>	<b>0.937</b>
C.V. among Divisions	39.8	25.15	32.07	73.08	32.35	49.5	84.2	83.0	28.9

Source: Authors' calculation

Note: Colouring of the table is based on the level of performance (individual scores against state average). Green signifies above state average, and black represents below state average.

C.V. - Coefficient of Variation

Based on the above criteria, number of districts is divided into two groups: (1) below the state average and (2) above the state average in each division. The number of districts whose score is below the state average in each division for each indicator is presented in Table 6.7. It is clear that the number of laggard districts is mainly concentrated in Nasik, Latur and Amravati agricultural

divisions. Divisions such as Kolhapur, Pune and Konkan division are the best performing in the state of Maharashtra.

**Table 6.7: Number of Districts with Score below the State Average (Based on Eight Regions)**

Divisions	Total Districts	BANK	HBF	PO	SHG	PACs	CREDIT	EXTCAP	INS	III
Konkan	4	1	4	1	2	4	1	1	4	1 (25)
Nasik	4	4	4	3	3	4	4	3	4	4 (100)
Pune	3	0	0	3	3	0	0	3	3	0 (0)
Kolhapur	3	0	0	1	1	0	0	1	2	0 (0)
Aurangabad	3	1	0	3	2	1	3	3	2	2 (67)
Latur	5	5	1	4	5	2	4	5	1	4 (80)
Amravati	5	4	4	3	4	2	3	5	3	5 (100)
Nagpur	6	3	1	4	0	2	5	4	5	1 (17)

Source: Authors' calculation

Note: Figures in the bracket indicate percentage of districts with score below the state average.

Further classification of districts has been done region-wise: Vidarbha, Marathwada, Khandesh, Western Maharashtra and Konkan<sup>1</sup>. The number of districts whose score is below the state average in each division for each indicator is presented in Table 6.8. It is clear that most of the laggard districts are mainly concentrated in Marathwada and Vidarbha regions.

**Table 6.8: Number of Districts with Score below the State Average (Based on Five Regions)**

Division	Total Districts	Financial Institution			Agriculture Supporting Institutions				Crop Insurance	III
		BANK	HBF	PO	SHG	PACs	CREDIT	EXTCAP	INS	III
Vidarbha	11	6	1	7	7	3	7	8	3	6 (55)
Marathwada	8	7	5	7	4	4	8	9	8	6 (75)
Khandesh	5	4	4	4	4	4	4	4	5	4 (80)
Western Maharashtra	5	0	0	3	3	0	0	3	3	0 (0)
Konkan	4	1	4	1	2	4	1	1	4	1(25)

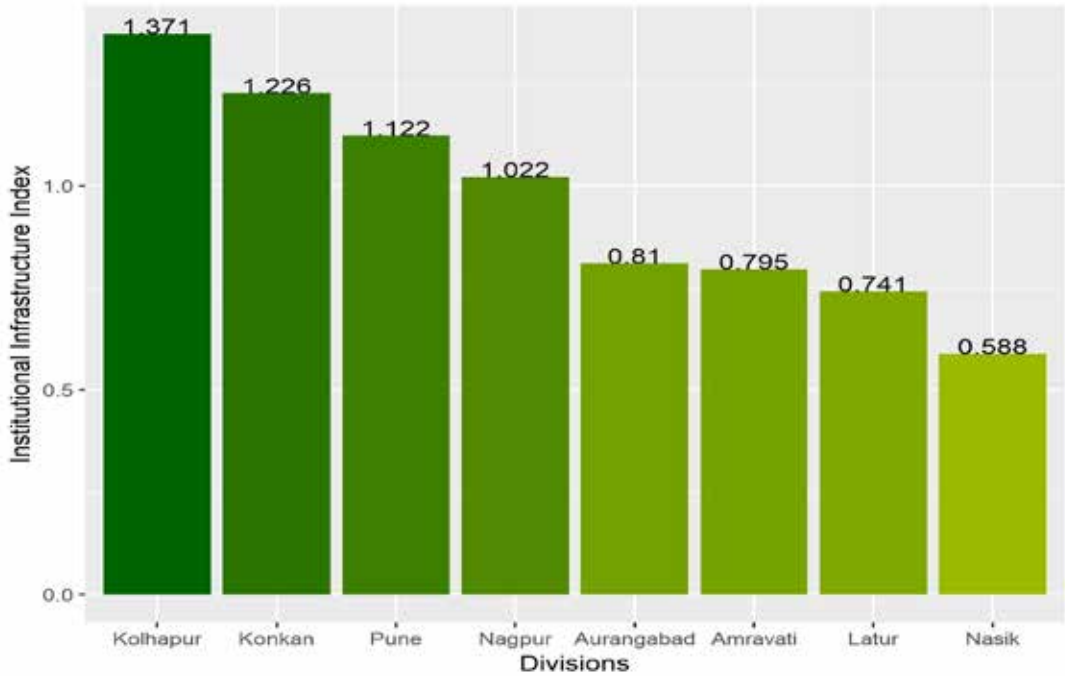
Source: Authors' calculation

Note: Figures in the bracket indicate percentage of districts with score below the state average

The Social Infrastructure Index for the eight divisions is shown in the following Figure 6.2. It is evident that Kolhapur is the top division in Maharashtra followed by Konkan, Pune and Nagpur in terms of Social Infrastructure Index. Nasik, Latur, Amravati and Aurangabad are laggard divisions and most of the laggard districts are concentrated in these divisions.

<sup>1</sup> Maharashtra has been divided into five administrative divisions based on government/administration purpose.

**Figure 6.2: The Barplot of Institutional Infrastructure Index of Divisions of Maharashtra**



Source: Authors' calculation

For the purpose of comparing the Institutional Infrastructure Index of eight divisions of Maharashtra, a one-way ANOVA technique was applied and the results are shown in Table 6.9.

The hypothesis to be tested:

$$H_0: III_{Konkan} = III_{Nasik} = III_{Pune} = III_{Kolhapur} = III_{Latur} = III_{Amravati} = III_{Nagpur}$$

*against*

$$H_1: \text{Not all IIIs are equal}$$

where III stands for Institutional Infrastructure Index

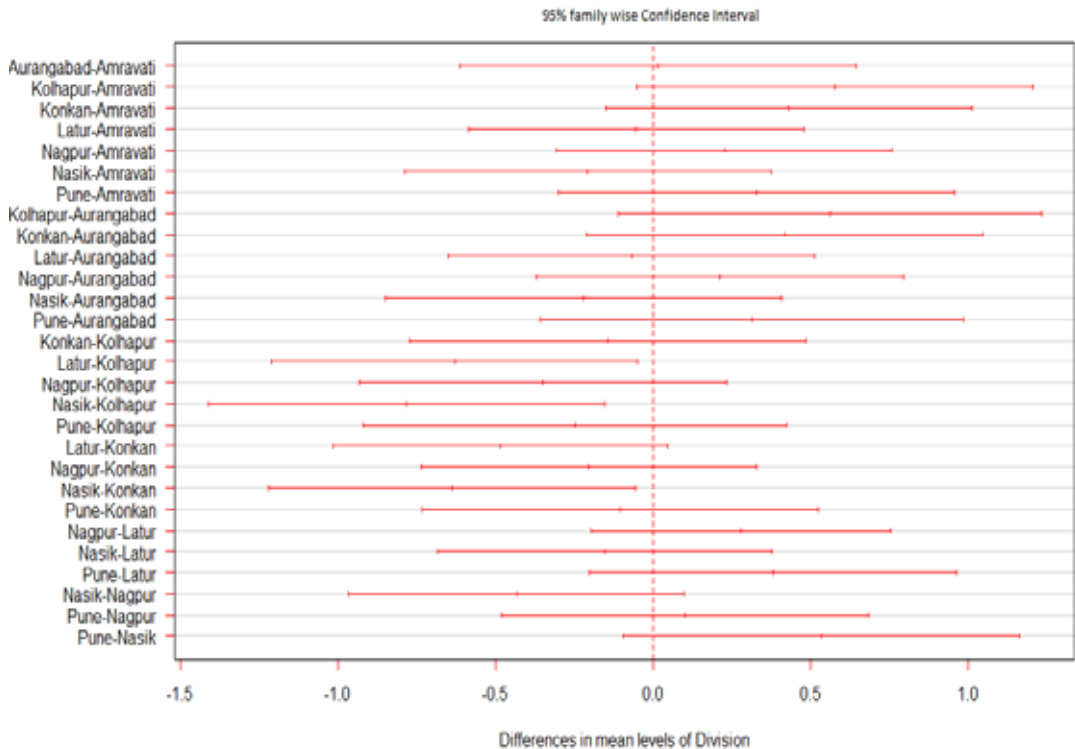
**Table 6.9: One-way ANOVA for Institutional Infrastructure Index among Divisions**

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	1.889	7	0.2699	4.338	.000
Within Groups	1.556	25	0.0622		
Total	3.733	32			

Source: Authors' calculation

Thus, the eight agri-divisions of the State are not performing at par with respect to provision of institutional infrastructure which prompts further post-hoc analysis to identify the most backward regions and inter-division comparison. Tukey's post-hoc analysis is shown graphically in Figure 6.3.

**Figure 6.3: Tukey Post-hoc Plot of Institutional Infrastructure Index of Agri-divisions**



Source: Authors' calculation



## 6.6 Conclusion

The objective of this chapter has been to provide relative rankings of districts using eight institutional parameters as institutional infrastructure is crucial for effective functioning and monitoring of both physical and social infrastructure. The relative rankings of districts indicate that there exist large disparities among districts in Maharashtra. Districts such as Sindhudurg, Kolhapur, Ratnagiri, Satara, Sangli and Solapur are relatively better performing compared to other districts, therefore, classified as high performing districts. However, districts like Beed, Buldhana, Nanded, Hingoli Jalgaon, Nandurbar, Thane and Dhule are relatively lowest in rankings, falling under least performing districts.

Similarly, division-wise rankings indicate that most of the backward or laggard districts are in Nasik, Latur and Aurangabad or in Marathwada and Vidarbha regions. These regions are most backward as identified by various reports such as Dandekar Committee (cited as GoM., 1984) and Kelkar Committee (cited as GoM., 2013). In this scenario, Maharashtra requires establishment of effective and quality institutional infrastructure in the areas of finance, agricultural support and insurance for backward districts in order to achieve balanced regional development. This is also vital for achieving Sustainable Development Goals (SDGs), 2030.



# Rural Development Infrastructure Index

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## Chapter-7

# Rural Development Infrastructure Index

## 7.1 Rural Development Infrastructure Index (RDII)

The Rural Development Infrastructure Index has been constructed on the basis of three indices – physical, social and institutional infrastructure – for the 33 districts and 8 divisions of Maharashtra. A simple arithmetic average of the three indices [viz. physical (Chapter 4), social (Chapter 5) and institutional (Chapter 6)] has been calculated and all the districts have been ranked. The ranking of the 33 districts is shown in Table 7.1 and the districts' composite rural infrastructure index scores are displayed in Figure 7.1.

**Table 7.1: Rural Development Infrastructure Index**

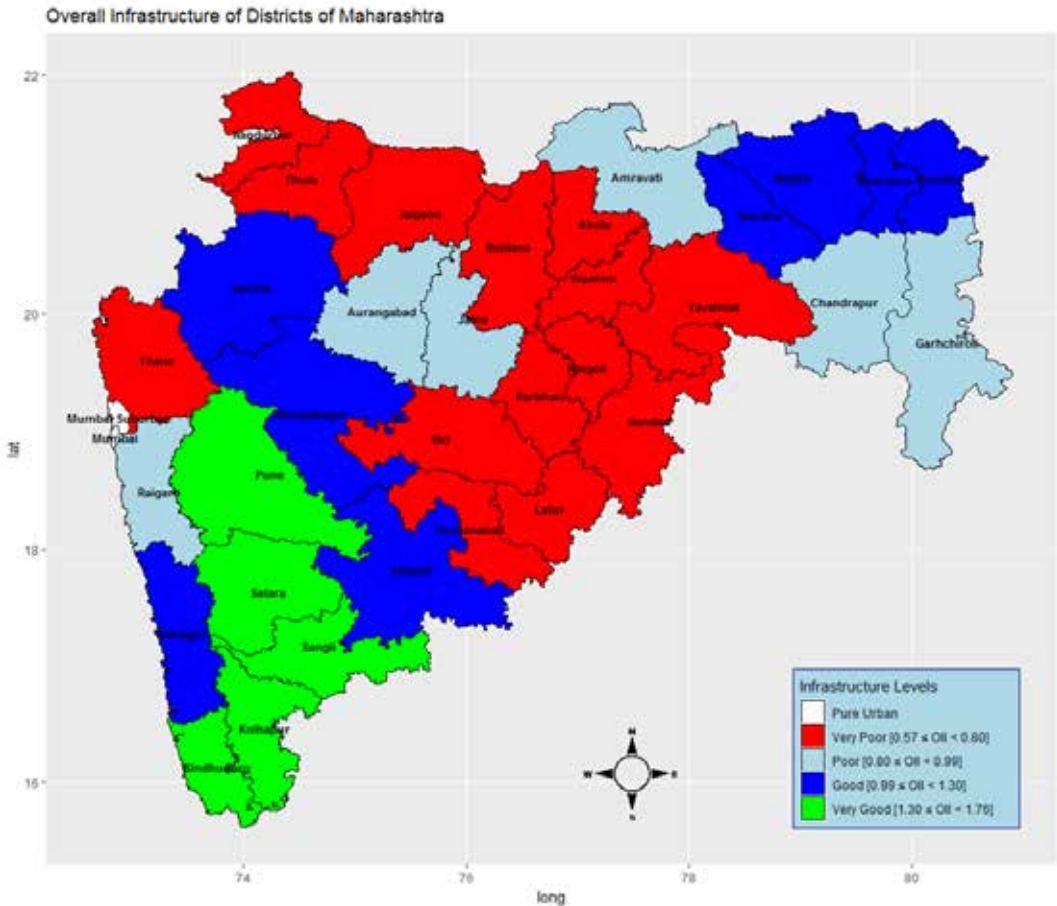
Districts	Score	Ranking	Districts	Score	Ranking
Sindhudurg	1.761	1	Raigad	0.937	17
Kolhapur	1.721	2	Aurangabad	0.835	18
Satara	1.676	3	Jalna	0.804	19
Pune	1.349	4	Buldhana	0.799	20
Sangli	1.331	5	Akola	0.796	21
Nagpur	1.275	6	Latur	0.788	22
Ratnagiri	1.248	7	Washim	0.774	23
Gondia	1.170	8	Osmanabad	0.760	24
Wardha	1.167	9	Beed	0.742	25
Solapur	1.160	10	Thane	0.726	26
Bhandara	1.138	11	Yavatmal	0.724	27
Ahmadnagar	1.072	12	Jalgaon	0.723	28
Nasik	1.053	13	Nanded	0.715	29
Amravati	0.962	14	Parbhani	0.706	30
Gadchiroli	0.955	15	Dhule	0.705	31
Chandrapur	0.953	16	Hingoli	0.698	32
			Nandurbar	0.575	33

Source: Authors' calculation

A better picture of the level of relative performance of districts in terms of Rural Development Index is presented in Figure 7.1 wherein district scores are divided into four performance groups:

- High Performance (very good) districts (Green Colour)
- Good Performance districts (Blue Colour)
- Poor Performance districts (Light Blue Colour)
- Very Poor Performance districts (Red Colour)

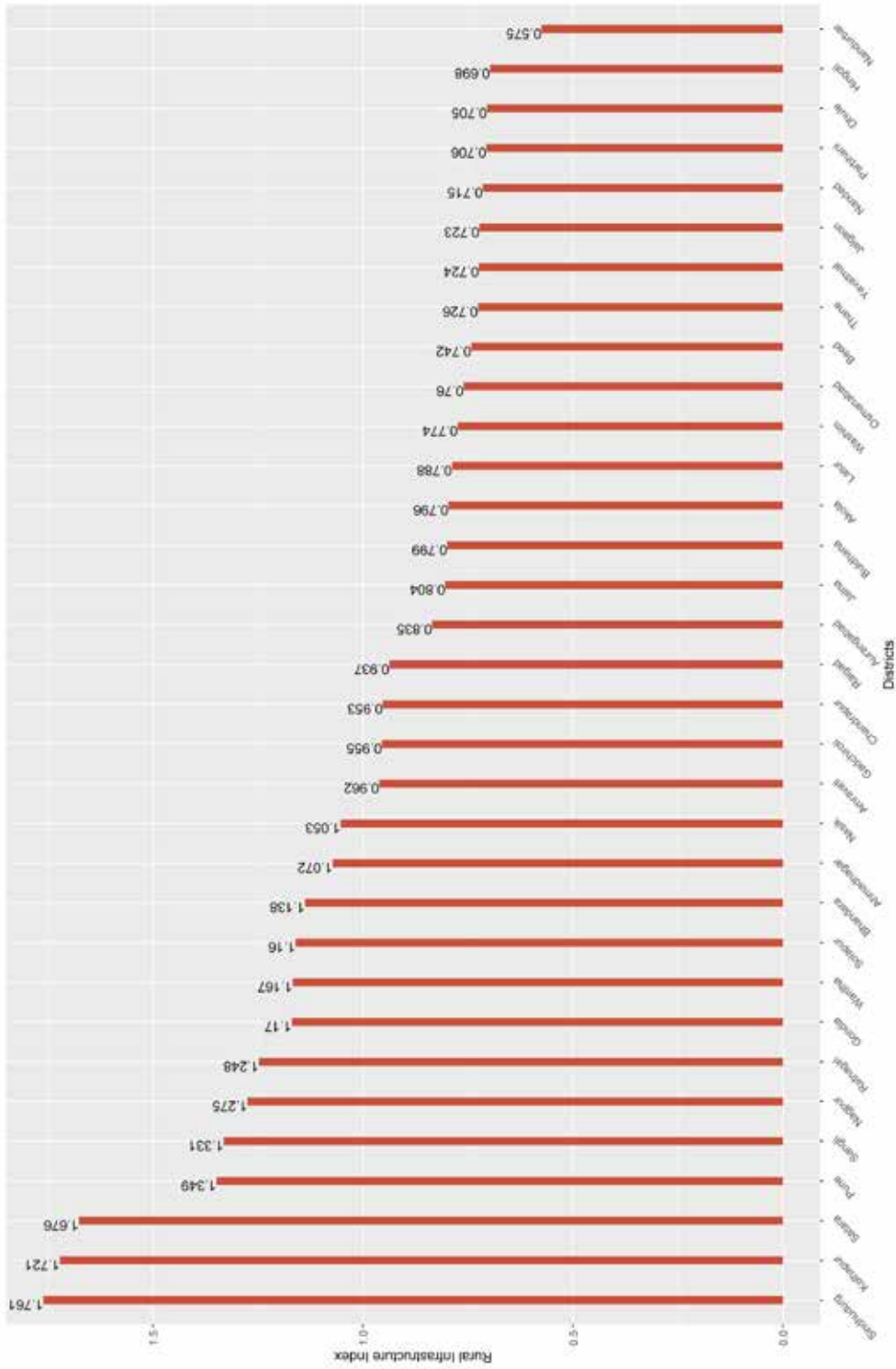
**Figure 7.1: Composite Rural Development Infrastructure Index**



Source: Authors' calculation

For clear understanding of the variation in the composite rural infrastructure index, a bar chart for the same is included as well. As it is observed, there is clear polarization in terms of availability of rural infrastructure across the districts of Maharashtra. The lowest composite infrastructure index value starts from the minimum of 0.574 (Nandurbar) to the maximum value of 1.76 (for Sindhudurg). Also, there are distinct inter-divisional variations as well as inter-district variations as exhibited in Figures 7.2 and 7.3.

Figure 7.2: Barchart Showing the Composite Rural Infrastructure Index



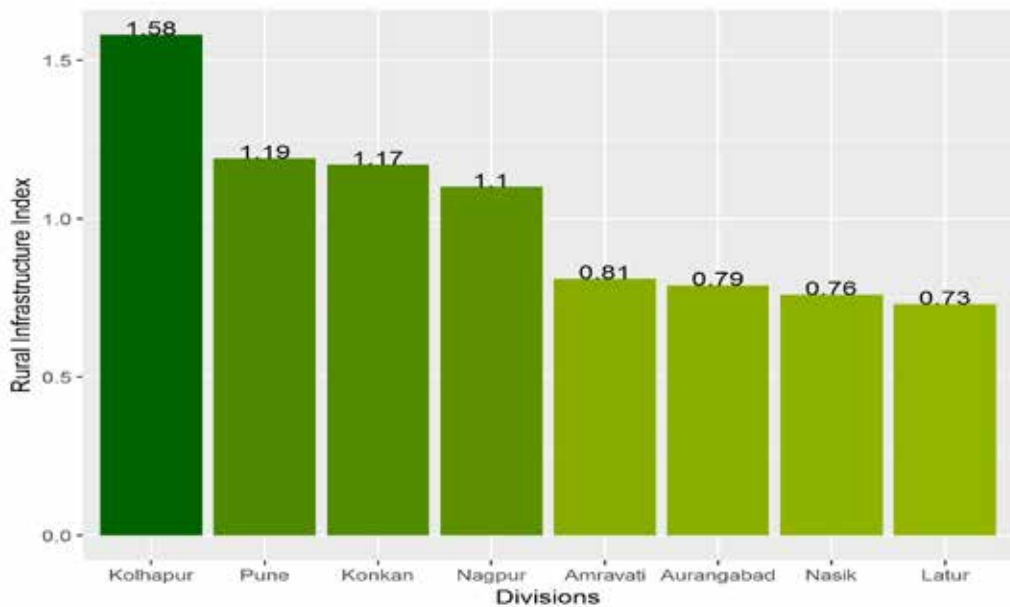
Source: Author's Calculation

At the other extreme, Sindhudurg is followed by Kolhapur, Satara, Pune, Sangli, Nagpur, Ratnagiri, Gondia, Wardha and Solapur. The districts of Osmanabad, Beed, Thane, Yavatmal, Jalgaon, Nanded, Parbhani, Dhule, Hingoli and Nandurbar are lowest ranking in terms of rural development infrastructure index in the state of Maharashtra.

## 7.2 Region-Wise Rankings of Districts

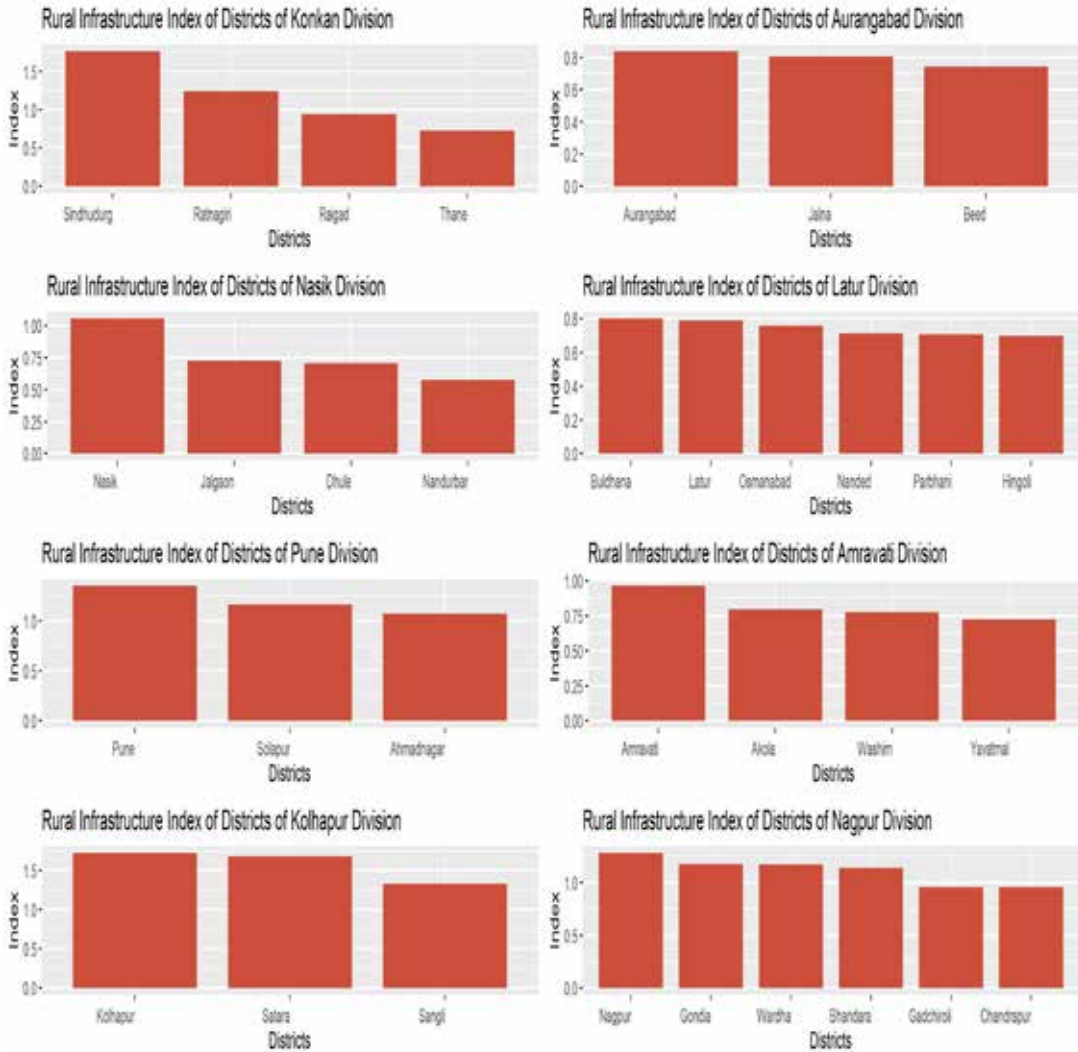
Relative performances of the eight agri-divisions and the districts within each of these eight agri-divisions are provided in Figures 7.3. and 7.4 respectively. It is clear that the divisions viz. Kolhapur, Pune, Konkan and Nagpur are performing very well in terms of overall rural infrastructure in Maharashtra. At the bottom, Aurangabad divisions followed by Nasik and Latur divisions show very low performances.

**Figure 7.3: Rankings of Divisions on Rural Development Infrastructure Index**



Source: Author's calculation

**Figure 7.4: Composite Infrastructure Index of Districts of Agricultural Divisions**



Source: Author's calculation



### 7.3 Sensitivity Analysis

It is commonly argued that rural infrastructure, such as roads, electricity, telecommunications, irrigation, education, health, access to finance are crucially important for rural development and poverty alleviation through improved agricultural productivity, increased rural farm and non-farm employment and improved human well-being. For this purpose, sensitivity analysis has been carried out to examine the link between rural infrastructure index and different development indicators such as per capita income, poverty, HDI and urbanization rate. The results are presented in Table 7.2.

**Table 7.2: Infrastructure-Development Nexus (Cross-correlation between Infrastructure Index and Development Parameters)**

Variables	PINC	PII	SII	III	RDII	UR	HDI	POV
PINC	1.00							
PII	0.49*	1.00						
SII	0.42*	0.61*	1.00					
III	0.38*	0.56*	0.86*	1.00				
RDII	0.49*	0.84*	0.92*	0.89*	1.00			
UR	0.78*	0.18	-0.02	-0.13	0.02	1.00		
HDI	0.91*	0.60*	0.53*	0.44*	0.61*	0.69*	1.00	
POV	-0.80*	-0.60*	-0.66*	-0.57*	-0.68*	-0.47*	0.86*	1.00

Source: Authors' calculation

\*indicates significant at 5% level.

PINC- Per Capita Income, PII - Physical Infrastructure Index, SII- Social Infrastructure Index, RDII- Rural Development Infrastructure Index, UR- Urbanisation Rate, HDI- Human Development Index, POV- Head Count Ratio.

Table 7.2 reveals that there is positive significant relationship between composite rural infrastructure index (including physical, social and institutional infrastructure indices) and all the economic development indicators (viz. income, HDI) except rural poverty. This is expected in the process of economic development. When this observation is taken in conjunction with the increasing availability of rural infrastructure, one can expect a positive relationship between the level of infrastructure availability and all the development indicators except rural poverty for which a negative relationship is expected. Therefore, the above analysis indicates that composite infrastructure index and its three dimensions (physical, social and institutional) truly capture the aspects of economic development for Maharashtra.



# Rural Development Infrastructure Index

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## Chapter-8

### Conclusion and Policy Recommendations

## 8.1 Summary and Findings

Maharashtra is the richest state in India in GDP terms, accounting for 14.8% of India's GDP, and its per capita income is 1.6 times that of all India. Maharashtra is the second largest state in India in terms of population accounting for 9.3% of the total population of India.

It is one of the highly urbanised states with 45.2% people residing in urban areas. At the same time, the proportion of rural population is significantly lower (54.8%), compared to the Indian average of 68.9%. Maharashtra accounts for a large proportion (around 7.4%) of the rural population in India.

The relatively high per capita income in the State, however, covers the enormous urban-rural, intra-district, and regional disparities in per capita income. Various committees such as the Dandekar Committee (cited as GoM.,1984) and Kelkar Committee (cited as GoM., 2013) have also found regional disparities in Maharashtra and recommended infrastructure development in backward areas to reduce regional disparities. Infrastructure development has the potential to transform rural livelihoods by improving productivity and living conditions as well as reducing poverty. Given the importance of infrastructure development for balanced regional development as well rural upliftment, this study constructs a rural development infrastructure index using principal component analysis and identifies disparities in rural areas across 33 districts and 8 agricultural divisions of Maharashtra. The rural development infrastructure index consists of three dimensions, namely Physical Infrastructure Index (PII), Social Infrastructure Index (SII), and Institutional Infrastructure Index (III) and 28 parameters.

The results of the study indicate significant disparities among districts and regions in terms of availability of infrastructural facilities in Maharashtra. With respect to physical infrastructure, the State fails to provide the same for all the 33 districts, and there appears to be a clear polarization in terms of provision of physical infrastructure among the districts. Districts like Kolhapur, Pune and some districts of Nagpur divisions are well off in terms of physical infrastructure, while the rest of Maharashtra is far away from providing sufficient physical infrastructure for the development of rural areas. The backward districts are lagging in terms of farm mechanization, household electrification, and, pumpset availability for irrigation, and conversion of agricultural pumpsets to energy-efficient pumpsets.

Social infrastructure – education, health and housing – is vital for developing human capital. Human capital can play a significant role in lifting people out of poverty, enabling them to lead a healthy and productive life and harnessing their skills. In terms of social infrastructure, the relative ranking of the districts indicates large inequalities in physical infrastructure among districts in Maharashtra, districts such as Sindhudurg, Kolhapur, Ratnagiri, Satara, Nagpur and Sangli to name a few. Wardha and Bhandara are well developed and best performing districts, while Nanded, Aurangabad, Thane, Parbhani, Dhule, Jalna, Latur and Nandurbar are backward

and worse performing districts in Maharashtra.

Like physical and social infrastructure, institutional infrastructure too is crucial for effective functioning and monitoring of the former. The relative ranking of the districts indicates that districts like Sindhudurg, Kolhapur, Ratnagiri, Satara, Sangli and Solapur are relatively better performing compared to other districts, therefore, classified as high performing districts. However, districts like Beed, Buldhana, Nanded, Hingoli, Jalgaon, Nandurbar, Thane and Dhule are relatively low in ranking, falling under least performing districts. Only 16 districts have outperformed the state average, with the remaining 17 districts have underperformed compared to the state average.

The study also provides division-wise ranking of Maharashtra in terms of physical, social and institutional infrastructure. Kolhapur, Pune and Konkan division are best performing in the state of Maharashtra. Most of the laggard districts are in Marathwada and Vidarbha regions. The rankings of districts in terms of infrastructure development corroborate with the findings of other studies by Dandekar Committee (cited as GoM., 1984) and Kelkar Committee (cited as GoM., 2013).

In order to complement the findings of secondary study, primary study for two districts was carried out. One district from the poor performing group (Beed) and another from the best performing group (Satara) were selected. The objective of primary survey has been to assess both quantitative as well as qualitative aspects of both the districts. The quality of infrastructure is assessed based on the accessibility and utilisation of services in sample districts. It was found that within the sample villages, there exists lack of basic infrastructure pertaining to access to drinking water and toilet facilities. Most of the internal roads within villages are unsurfaced. Moreover, the “other district roads” connecting villages with Taluka headquarters need appropriate maintenance.

The infrastructure of Zilla Parishad schools requires considerable improvement in terms of sanitation, basic services like rest rooms, toilets, drinking water and cattle sheds within wholesale markets. Moreover, irrigation infrastructure needs to be enhanced, especially in Beed district.

The Rural Development Infrastructure Index helps in identifying and prioritizing issues by measuring a district’s relative performance in terms of various infrastructure parameters. These relative results enable districts not only to assess their areas of strengths and weaknesses, but also to identify other districts that may serve as role models, and prioritize actions accordingly. The classification of high (low) infrastructure development districts, is not necessarily high (low) on all facets of infrastructure development. The top-ranking districts such as Sindhudurg, Kolhapur, Satara, Pune, Sangli and Ratnagiri show that high levels of infrastructure development are possible, however, even these districts have their areas of concern. Thus, it becomes imperative for districts to identify the most pressing issues and prioritize development agendas accordingly.

The Index provides valuable findings at two levels: district-specific and state-wide. On one hand, there are certain components on which all the districts demonstrate low performance; on the

other hand, there are certain components on which variation is registered across districts and where the state government has to chalk out plans of action to drive improvements. Sensitivity analysis shows that there is significant relationship between infrastructure index and different developmental indicators, reflecting the fact that Rural Development Infrastructure Index captures true dimension of development for rural Maharashtra. Given the ground realities and uneven development in Maharashtra, several areas need focused attention.

## 8.2 Recommendations for Government of Maharashtra

The findings of the study reveal a significant variance in availability of physical, social and institutional infrastructure in Maharashtra and many districts are lagging behind the average state score. To address the limitations, it is recommended that the Government of Maharashtra will be required to undertake measures at the district level to improve physical, social and institutional infrastructure development. The recommendations are:

- i. The laggard districts have not realised their irrigation potential. There is a need to enhance the potential with the prime objective of improving cropping intensity, which is an important determinant of agricultural productivity. Government will have to explore water-saving technologies like micro-irrigation, drip irrigation facilities in rain fed districts, and other innovative interventions.
- ii. A detailed action plan needs to be in place to improve rural transport connectivity. While the Chief Minister Gram Sadak Yojana (CMGSY- 2015) and the Pradhan Mantri Gram Sadak Yojana (PMGSY - 2000) are responsible to provide all-weather road connectivity to the unconnected habitations in the rural areas, this should be supported by enhancing the services of Maharashtra State Transport Corporation (MSRTC), which should work towards serving 100% of the villages in the State.
- iii. Mobile connectivity needs to be considered on a priority basis in many districts particularly, Osmanabad, Jalna, Hingoli, Nagpur, Raigad, Amravati, Chandrapur, Wardha, Yavatmal, Washim, Gadchiroli, Akola, and Buldhana. In this regard, the Government of Maharashtra announced a Telecom Infrastructure Policy to support various citizen-centric digital initiatives in January, 2018. Since the new policy is a case of work in progress, the findings of the study can direct the applicable and relevant changes to enhance mobile connectivity in the aforementioned districts.
- iv. The districts like Jalna, Parbhani, Ahmadnagar, Nanded, Aurangabad, Hingoli, Osmanabad, Yavatmal, Nasik, Solapur, Gadchiroli and Nandurbar are scoring poorly with respect to household access to electricity. In this context, Deendayal Upadhyaya Gram Jyoti Yojana (DDUGJY) for rural household electrification should be expanded and accelerated to cover up lagged districts with the objective of providing electricity to all households.

- v. Access to electricity for agricultural activities needs to be improved in many districts such as Akola, Bhandara, Kolhapur, Wardha, Gondia, Gadchiroli, Nagpur, Chandrapur, Sindhudurg, Raigad, Ratnagiri and Thane. To this effect, it has been observed that the Government of Maharashtra has enhanced electricity subsidy for procuring electricity supplied to the agricultural pumps.
- vi. Major thrust should also be given to increase the number of wholesale markets, storage capacity and agricultural extension staff in some of the slacker districts, viz., Amravati, Jalna, Parbhani, Sangli, Yavatmal, Wardha, Buldhana, Pune, Latur, Osmanabad, Beed, Nanded, Hingoli and Ratnagiri. The Government of Maharashtra, in August 2016, launched Sant Shiromani Shri Savata Mali Shetkari Athavade Baajar Abhiyaan with the objective of reducing the post-harvest losses by way of direct sale of agricultural produce from farmers to consumers on the basis of farm-to-fork model. The Rashtriya Krishi Vikas Yojana (RKVY) could be used for enhancing the storage capacity. Alternately, Rural Infrastructure Development Fund (RIDF) could also be used to increase the storage and godown capacity.
- vii. Not only physical infrastructure, greater emphasis should also be given to improve social infrastructure indicators which include education and health. The Government of Maharashtra should strive towards 100% rural literacy, ensuring the 1:30 student-teacher ratio, as prescribed by the Right of Children to Free and Compulsory Education Act (RTE).
- viii. With respect to health infrastructure, the Government of Maharashtra should ensure the provision of prescribed number of hospitals which will result in a minimum of two beds per 1000 as a policy mandate, although as per the World Health Organisation (WHO) standards, a minimum of three beds per 1000 is the required norm. The 100% benchmark is also recommended for institutional deliveries across districts. The number of Accredited Social Health Activist (ASHA) workers should be recruited as per norms prescribed.
- ix. While the Government of India has given guidelines for access to safe drinking water by 2022, this can be prioritised in many districts such as Buldhana, Ratnagiri, Aurangabad, Akola, Latur, Osmanabad, Thane, Parbhani, Jalna, Bhandara, Hingoli, Washim, Beed, Nandurbar, Nanded, Yavatmal, Gondia, Chandrapur and Gadchiroli, which are performing poorly in this regard, through the implementation of the Mukhyamantri Rural Drinking Water Programme (MRDWP).
- x. Access to toilet facilities should be given major thrust as many households in districts like Latur, Jalna, Jalgaon, Buldhana, Washim, Nanded, Hingoli, Dhule, Yavatmal, Parbhani, Nandurbar, Osmanabad, Gadchiroli and Beed (in the regions of Nasik and Amravati) have limited toilet facilities. Through the Swachh Bharat Abhiyan initiative, building of toilets in rural areas should be accelerated to ensure that the gram panchayat is declared open defecation free (ODF) by October 2019.

- xi. Additional efforts are also required for improving institutional infrastructure such as increasing the number of banking outlets in villages, enhancing the access to banks and encouraging number of sanctions and disbursements under the Pradhan Mantri MUDRA Yojana. Moreover, a special thrust should be given to have an effective financial inclusion through Pradhan Mantri Jan Dhan Yojana (PMJDY).
- xii. It is not only important to increase the number of SHGs, PACs and ground level credit outlets, including agribusiness clinic and agricultural extension staff and crop insurance coverage but also the quality of services provided across the districts and specially in the laggard districts like Parbhani, Latur, Gadchiroli, Amravati, Dhule, Wardha, Gondia, Yavatmal, Buldhana, Jalgaon, Nanded, Beed, Thane, Washim, Hingoli and Nandurbar.
- xiii. Major emphasis should be given to expand SHGs and PACs in rural areas for enhancing credit availability for rural households, marginal farmers and unbanked people. Both SHGs and PACs should be supported with RIDF fund for building rural infrastructure. Apart from that, in order to get more and more participation from females in rural areas, special support should be given to build grass root public institutions of SHGs, to provide microfinance services to SHGs, livelihood and micro enterprise development as well as women empowerment and social equality.
- xiv. It is essential to increase the coverage of crop insurance to stabilise incomes from agricultural operations. The government needs to increase awareness about crop insurance among the farmers. Further, in order to avoid chronic indebtedness, the indebted farmers need to get support from the State through the Chhatrapati Shivaji Maharaj Shetkari Sanman Yojana which has come into effect since June 2017. This scheme makes provision for waiving crop loan / agriculture loan of farmers who are unable to repay loans due to natural calamities.
- xv. Greater effort is required for increasing agricultural extension staff, soil testing labs and agribusiness clinics for improving agricultural research and development, information and extension activities, and knowledge and markets for farm products. There are number of schemes which support the state governments in their agricultural extension activities which need to get promoted. Centre has already implemented extension system which is in the form of an Agricultural Technology Management Agency (ATMA) at district level to operationalise the extension reforms.
- xvi. Government of Maharashtra should also target improving physical, social and institutional infrastructure in Nasik, Latur and Aurangabad regions for reducing regional imbalance as these divisions are aspirational in relation to the other regions/ divisions. State government needs to evaluate separately each aspirational district with respect to the declared indicators. Refer Table 8.1 for the list of aspirational districts mentioned by Niti Aayog.



**Table 8.1: Transformation of Aspirational Districts**

Rank in India	State	District	Score
<b>Overall Ranking</b>			
3	Maharashtra	Osmanabad	47.53%
11	Maharashtra	Washim	44.18%
14	Maharashtra	Gadchiroli	42.50%
39	Maharashtra	Nandurbar	37.19%
<b>Health (Social)</b>			
16	Maharashtra	Gadchiroli	44.17%
20	Maharashtra	Osmanabad	43.59%
34	Maharashtra	Washim	40.85%
95	Maharashtra	Nandurbar	31.36%
<b>Education (Social)</b>			
2	Maharashtra	Osmanabad	67.08%
3	Maharashtra	Gadchiroli	66.13%
5	Maharashtra	Washim	64.61%
10	Maharashtra	Nandurbar	59.51%
<b>Agriculture</b>			
4	Maharashtra	Osmanabad	25.45%
12	Maharashtra	Washim	20.02%
69	Maharashtra	Nandurbar	8.79%
72	Maharashtra	Gadchiroli	7.99%
<b>Financial Inclusion (Institutional)</b>			
69	Maharashtra	Osmanabad	33.73%
76	Maharashtra	Gadchiroli	31.72%
87	Maharashtra	Washim	29.07%
88	Maharashtra	Nandurbar	28.04%
<b>Skill Development</b>			
56	Maharashtra	Nandurbar	4.22%
60	Maharashtra	Osmanabad	3.60%
73	Maharashtra	Gadchiroli	1.44%
74	Maharashtra	Washim	1.22%
<b>Basic Infrastructure</b>			
9	Maharashtra	Osmanabad	73.71%

Rank in India	State	District	Score
13	Maharashtra	Washim	70.23%
20	Maharashtra	Nandurbar	65.58%
33	Maharashtra	Gadchiroli	61.47%

Source: Niti Aayog (2018)

## Rural Development Infrastructure Index

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### Appendix A

#### A Case Study of Two Select Districts of Maharashtra: Beed and Satara

## A.1 Conceptualizing a Case Study

The study, so far, has tracked the status of rural infrastructure condition for 33 districts of Maharashtra in three different dimensions based on secondary data. It has considered 12 parameters in physical infrastructure, eight parameters in social infrastructure and eight parameters in institutional infrastructure to capture the entire rural infrastructure quality, and ranked the relative efficiency of the districts. However, the few key parameters that have been considered for the study, are dated back to 2011 Census data due to non-availability of latest data in public domain. Therefore, the secondary analysis of available data has become restrictive. The study could not track the recent progress on the issues. Moreover, according to the composite ranking of the districts and analysis of variance across districts in different regions, there is huge difference among the districts. The variance is more in physical dimension of rural infrastructure. In order to understand the reason behind the variance in composite index, a parameter-wise study is utmost necessary. Further, another limitation is it couldn't consider all infrastructure-based variables directly for the study because of non-availability of district-wise bifurcated (rural and urban) data. The outcome based variables have been considered as proxy to gauge the quality and outreach of infrastructure for the districts. Therefore, without having clear idea about the actual parameters, it is very difficult to back the result of secondary data. Although case studies are vastly underleveraged, they are immensely effective at understanding ground reality and recent progress on the issues. This appendix presents the quantity and quality of rural infrastructure development in two select districts of Maharashtra viz., Beed and Satara, based on data collected and compiled from local modal agencies and information gathered from the interaction with stakeholders at individual level, and sometimes from focus group discussions. In order to have static comparative analysis on the ground-level infrastructure quality, this case study has considered two districts, Satara from top performing and Beed from bottom in the rank of Rural Infrastructure Development Index. This section draws the data from the responses to structured interview schedule presented in Appendix C. The interview schedule has been prepared on the basis of 28 basic parameters mentioned in Table A-1. The objective of primary data collection is to assess the quality and accessibility of rural infrastructure at unit level. A village level survey was conducted and data collected from structured interviews of Gram Sevak<sup>1</sup>, Talathi<sup>2</sup>, Agricultural Assistants<sup>3</sup>, School Teacher or Principal, Medical Officer of Primary Health Centre, Agricultural Market Traders and Agricultural Produce Marketing Committee (APMC) staff. Hence, villages selected may be of similar size across districts. The medium size villages (with population of 1000-1999 as per 2011 Census) were listed. Parameters of case study evaluation are designed on the basis of the overall study objectives and results of secondary data analysis.

1 Village level worker, who is the ex-officio secretary of the gram panchayat.

2 Village level revenue officer

3 Village level farm extension workers

**Table A- 1: Indicators for Primary Survey**

Dimension	Variable Name	Detailed Description
Physical	Agriculture and Irrigation	Land Utilisation Statistics/Cropping intensity
		Sources and Availability of Irrigation
	Electricity	% of rural households with electricity connection
		Total agriculture pumpsets energised
		Supply of electricity for household and agriculture
		Number of street lights within villages
	Transport and Mobility	Nature of road connecting villages and quality of internal roads
		Availability and frequency of public transport
	Communication	Availability of post offices
	Agricultural Marketing	Facilities available within the nearest wholesale market
		Milk collection centres
		Distance to nearest agricultural input shops
	Storage	Availability of storage and godown
Social	Amenities	Pucca <sup>4</sup> houses
		Drinking water
		Sanitation and drainage facilities
	Educational	Student-teacher ratio
		Number of classrooms
		Basic facilities in schools
	Health	Accessibility to nearest PHC/hospital
Service availability at nearest PHC/hospital		
Institutional	Banking	Accessibility to the nearest banking facility
	Cooperation/ Farmers Groups	Number of SHGs and fair price shops
		Access to dairy and marketing cooperative
Extension	Frequency of visits of agricultural assistants in the village	

Source: Authors' computation

<sup>4</sup> A pucca house is one, which has walls and roofs made of the following materials:

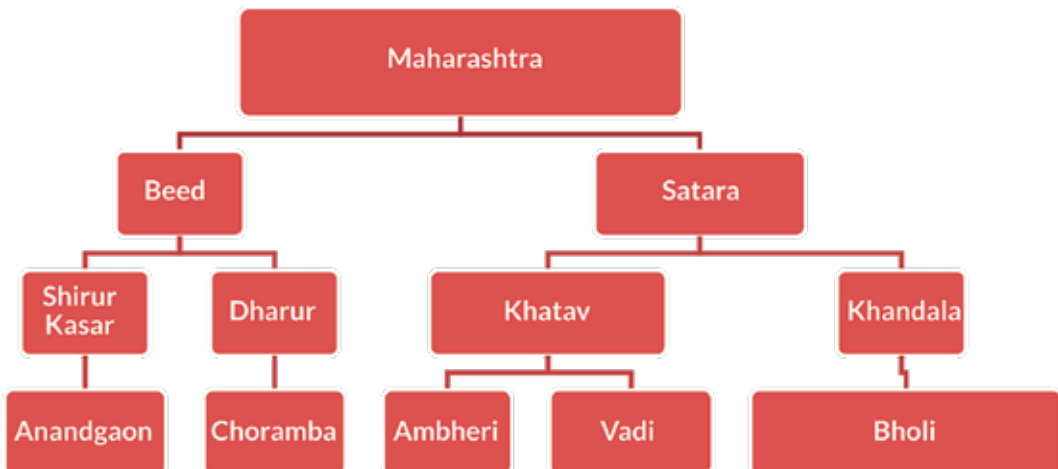
- Wall material: Burnt bricks, stones (packed with lime or cement), cement concrete, timber, ekra etc.;
- Roof Material: Tiles, Galvanised Corrugated Iron sheets, Asbestos Cement Sheet, Reinforced Brick Concrete, Reinforced Cement Concrete and Timber, etc.

### A.1.1 Sampling Design

A multi-stage purposive sampling method has been adopted for primary data collection.

- At first stage, districts of Beed and Satara were selected on the basis of their respective ranks of estimated composite infrastructure index (refer to Table 7.1). Satara district is selected as it is among the top three districts in composite Rural Infrastructure Development Index. On the other hand, Beed is picked as it stands among the poor performing districts as per the index.
- In the second stage in each district, two talukas were selected on the basis of their estimated value of cropping intensity. As the select talukas were representative of the district condition, sample criterion for taluka selection was cropping intensity. Sample talukas were found to have good potential in agricultural productivity. They were nearly close to the average of the respective districts.
- In the third stage, in each taluka, one or two villages were selected on the basis of population density. The medium sized villages (with population of 1000-1999 as per 2011 Census) were listed. The villages were selected on the basis of cultivable area under irrigation close to the taluka average. The villages selected are listed in Figure A-1.

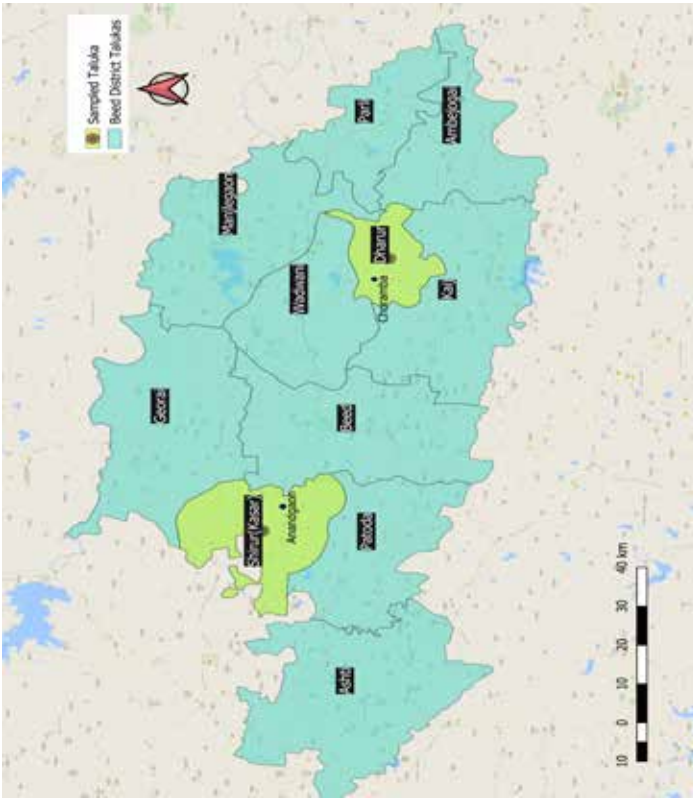
**Figure A-1: Sampling Design for Primary Survey**



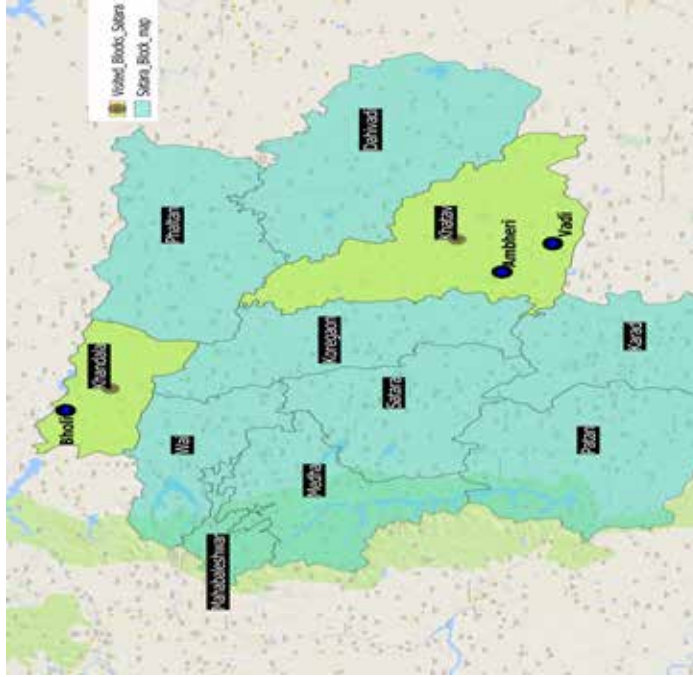
Source: Authors' own

**Figure A-2: Maps of Sampled Talukas in Selected Districts**

Panel (A): Beed District



Panel (B): Satara District



Source: GIS maps

## A.1.2 Profile of Study Districts

Beed district is situated in the central part of Maharashtra and lies between 18° 27' and 19° 27' North latitudes and 74° 49' to 76° 44' East longitudes. It is surrounded by Aurangabad and Jalna districts to the North, Parbhani district to the North-East, Latur district to the South-East, Osmanabad district to the South and Ahmednagar district to the West (Census of India 2011, 2014a).

Satara district lies at the Western limit of the Deccan Plateau in Southern Maharashtra. It is situated in the river basins of the Bhima and Krishna rivers. The District extends between 17° 05' and 18°11' North latitudes and 73° 33' and 74° 54' East longitudes. It is surrounded by Pune district to the North, Solapur district in the East, Sangli district to the South and Ratnagiri district to the West. It also has a small boundary of about 24 km with Raigad district in the North-West (Census of India 2011, 2014b). Other demographic and topological profile of the two districts are given in Tables A-2 and A-3.

**Table A-2: Selected Indicators of Survey Districts (2011)**

Particulars	Beed	Satara
Total number of talukas	11	11
Total number of villages	1,368	1,739
Total population (number)	25,85,049	30,03,741
Area (in sq. km.)	10,693	10,480
Density (Number of persons/sq. km.)	242	287
Proportion of rural population (in %)	81.0	81.0
Proportion of SC (in %)	13.6	10.8
Proportion of ST (in %)	1.3	1.0
Total literacy rate (in %)	77.0	82.9
Cultivators (workforce in %)	48.3	43.2
Agricultural labourers (workforce in %)	29.8	21.9
Percapita income of District (₹) for 2013-14; Maharashtra State Average: ₹ 1,17,091	65,369	93,518
HDI rank within Maharashtra	25	10

Source: YASHADA (2014), GoM (2015), Census of India 2011 (2014a, 2014b)



**Table A-3: Topography**

Particulars	Beed	Satara
Agro climatic zone (NARP)	Western Maharashtra Scarcity Zone (MH-6) Central Maharashtra Plateau Zone (MH-7)	Southern & Eastern part: Scarcity Zone; Central part: Plain Zone; Western Part: Sub-Mountain Zone
Annual rainfall (mm)	743.4	1033
Cropping intensity (%) as per 2015-16	133.1	123.34
Average landholding (2010-11 Census)	1.58	0.96

Source: Comprehensive District Agricultural Plan (C-DAP) 2012-13 to 2016-17 Beed and Satara

The maximum area of Beed and Satara district is categorized as scarcity zone, and agriculture is dependent mainly on monsoons. The key topographical indicators are presented in Table A-3.

### A.1.3 Profile of Sample Villages

Anandgaon and Choramba are two select villages in Beed district. Anandgaon is a village in Shirur (Kasar) taluka, and Choramba is in Dharur taluka of Beed district in Maharashtra. Anandgaon is one of the 94 villages of Shirur taluka. It is located 5 km away from taluka headquarter and 40 km from district headquarter. Choramba is one of the 67 villages of Dharur taluka and is located 9 km away from taluka headquarter and 50 km from district headquarter.

Ambheri and Vadi are villages in Khatav taluka, while Bholi is in Khandala taluka of Satara district in Maharashtra. Ambheri and Vadi are among the 139 villages of Khatav taluka. Ambheri and Vadi are located 20 and 26 km distant from taluka headquarter and 45 and 50 km from district headquarter respectively. Bholi is located 12 km away from Khandala taluka headquarter and 60 km from district headquarter. The demographic profile and land utilisation statistics of sample villages are presented in Tables A-4 and A-5.

**Table A-4: Demographic Indicators of Sample Villages**

Particulars	Beed		Satara		
	Shirur Kasar	Dharur	Khatav		Khandala
	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Total geographical area (in hectares)	976	894	1231	637	627
Total households (number of units)	242	373	424	344	381
Population of the village	1146	1582	1752	1632	1595
Population density (persons per sq. km.)	117	177	142	260	255
Sex ratio (females per 1000 males)	857	965	982	993	1014
SC population (%)	4	10	11	18	8
ST population (%)	0	33	1.33	0	0
Total literacy rate (%)	71	70	86	80	90
Male literacy rate (%)	81	80	91	87	97
Female literacy rate (%)	59	59	80	73	83

Source: Census of India 2011 (2014a, 2014b)

**Table A-5: Land Utilisation Statistics of Sample Villages (2016-17, Units in %)**

Particulars	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Cultivable land area	95.2	83.6	61.5	96.1	24.9
Area under forest	0.0	0.0	24.3	0.0	1.7
Barren and unculturable land	0.0	1.8	0.0	0.0	0.0
Cultural waste land	1.1	0.8	13.3	0.0	6.0
Area under non-agricultural use	0.3	0.3	0.1	3.9	27.3
Permanent pasture & other grazing land	3.4	13.1	0.5	0.0	39.1
Other uncultivated land excluding fallow	0.0	0.0	0.0	0.0	0.0
Current fallow lands	0.0	0.0	0.0	0.0	0.6
Total geographical area	100.0	100.0	100.0	100.0	100.0
Cropping intensity	119.0	123.0	195.0	157.0	192.0
Major crops	Bajra, Toor and Moong	Cotton, Bajra and Corn	Soybean, Jowar and Cluster Beans	Soybean, Jowar, Bajra and Groundnut	Bajra and Jowar

Source: Records of Agricultural Assistant of respective villages

## A.2 Access to Physical Infrastructure

In this section, the accessibility to physical infrastructure such as roads, electricity supply, agriculture market facilities and banking services among the sample villages is presented. Means and accessibility to public transport across sample villages are measured in terms of distance from the nearest town and railway station as shown in A-6.

**Table A-6: Means and Accessibility of Public Transport Across Sampled Villages**

Particulars	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Nature of road connecting village	Standard Single Lane				
Distance to nearest town (in km.)	40	9	18	30	20
Distance to nearest railway station (in km.)	110	55	18	30	20
Frequency of MSRTC (in an hour during daytime)	Once				
Access to maxi cab/modified autos services	Yes	Yes	Yes	Yes	No
Access to private bus services	No				

Source: Authors' compilation based on primary survey

All the five villages are connected with other district roads<sup>5</sup>. Choramba village is connected to the other district road through the village road built under Pradhan Mantri Gram Sadak Yojana (PMGSY).

**Figure A-3: Quality of Village Road Connecting Other District Roads in Shirur Kasar Taluka (Beed) and Internal Village Roads of Bholi (Satara)**



Source: Authors' compilation based on primary survey

<sup>5</sup> Other District Roads (ODR): These are roads serving rural areas with respect to movement of agricultural produce and providing them with outlet to market centres, taluka headquarters, block development headquarters or other main roads (Census of India 2011, 2014a).

## Other Observations:

- Generally during the day time, once in an hour there is MSRTC bus service from Taluka headquarters to village and back. In Bholi village, there are three services within the whole day from Taluka headquarter.
- Villagers have to rely on shared 'Maxi-Cab' services<sup>6</sup> which are irregular.

## A.2.1 Road

The total length of internal roads of sample villages is presented in Table A-7.

**Table A-7: Internal Road Length (in km) in Sample Villages**

Particulars	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Total road length within village	2.5	1.5	1.5	2	3.5
Surfaced road length	1.5	1.5	0.2	1	0
Unsurfaced road length	1	0	1.3	1	3.5

Source: Records of Gram Sevak of respective villages

## A.2.2 Electricity

**Table A-8: Electricity Supply in the Sample Villages**

Particulars	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Households having electricity connection (%)	24	75	78	88	95
Number of street lights (Number)	56	50	1	85	60
Street lights powered by electricity	56	27	1	77	52
Street lights powered by Solar	0	23	0	8	8
Pumpsets energized (%)	100	93	100	100	100
Power supply for agriculture use summer (April-Sept) per day (in hrs)	8	6	6	8	8
Power supply for agriculture use winter (Oct-March) per day (in hrs)	8	8	6	8	8
Power supply for all users summer (April-Sept) and winter (Oct-March) per day (in hrs)	22	22	22	24	24

Source: Primary Survey

<sup>6</sup> Maxicab, means any motor vehicle constructed or adapted to carry more than six passengers but not more than 12 passengers, excluding the driver, for hire or reward (Government of India, 2012, p. 34).

## Observations:

- There are two different electricity connections available in rural areas. One is for household consumption and another for irrigation purpose.
- All the pumpsets in the sample villages are reported as energised.
- All households are not having connections.
- Villagers of Anandgaon have been facing severe distress due the consecutive droughts in 2012-13, 2014-15 and 2015-16, and have dropped their electricity connection due to non-affordability.
- 90% of the households in Anandgaon village (Beed district) migrate for six months to work in sugarcane fields while the crop matures.
- The supply of electricity for household is almost 24 hours a day in Satara, while for Beed it is 22 hours a day. Power supply for agriculture is nearly eight hours a day. However, these eight hours could vary anytime within the day (sometimes in the morning or occasionally at night).

## A.2.3 Irrigation

**Table A-9: Village-wise Availability of Sources of Irrigation**

Particulars	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Open wells (number of units)	32	40	140	130	55
Tube wells (number of units)	32	60	62	25	20
Ponds (number of units)	1	3	2	7	2
Canal irrigation	No	No	No	No	Yes

Source: Government Records at Village Level.

## Figure A-4: Farm Pond in Choramba



Source: Primary Survey

### Observations:

It is observed that there are less number of open wells and tube wells available for irrigation in villages of Beed district compared to villages in Satara. Water is available in open and tube wells for around six months in a year i.e. till the month of December in Anandgaon village of Beed District. This limits the farmer capacity to produce two crops throughout the year. In Satara, the water is available in open and tube wells till February. There are farm ponds available in the sample villages (refer Figure A-4). But in some of the farm ponds in Anandgaon and Satara, the farm ponds did not have plastic-films needed for the water to stay in the pond.

## A.2.4 Post-office and Agricultural Markets

**Table A-10: Village-wise Market and Communication Infrastructure Access (Units in km)**

Particulars	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Post office/sub-post office	5	0	0	2	0
Wholesale agriculture market	40	9	20	25	18
Village market	5	7	3	5	8
Godown for farm produce	40	9	15	30	18
Milk collection centre	5	21	0	0	0
Milk chilling centre	5	40	20	2	15
Cold storage	40	17	20	25	15
Soil testing lab	40	50	50	50	55
Fertilizer shop	5	9	10	5	8
Tractors	40	10	20	30	7

Source: Primary Survey

**Table A-11: Profile of Nearest APMC from the Village**

Particulars	Anandgaon	Choramba	Ambheri	Vadi	Bholi
APMC	Beed	Dharur	Vaduj	Vaduj	Lonad
Nearest APMC (km from village)	40	9	20	25	18
Notified area of nearest market Committee (in Hectares)	4	7.8	3.4	3.4	5.4
Vegetables and fruits traded	Yes	No	No	No	Yes
Electric display board	No	No	No	No	No
Canteen	No	No	No	No	No
Drinking water facilities	Yes	No	Yes	Yes	Yes
Toilets	No	Yes	Yes	Yes	Yes
Concrete internal roads	No	Yes	No	No	Yes
Rest house for farmers	No	Yes	No	No	Yes
Garbage disposal system	No	No	No	No	No
Cattle shed	No	No	No	No	Yes
Street light	No	No	No	No	Yes

Source: Primary Survey

### Observations:

- There is paucity of drinking water and toilet facilities in Beed and Dharur APMC (Table A-11). In Vaduj APMC of Satara district, toilet facilities are not in a usable condition (uncleaned).
- There is a need for more storage space at APMC as farmers have to keep their produce outside, which leads to post-harvest losses.
- Traders in Beed district have reported about lack of space for trading and auction of fruits and vegetables within APMC.
- The village markets are 3-8 km away from the sample villages. Also, they are functional once in a week.
- It is observed that small scale and marginal scale farm holders do not have proper storage facilities. Availability and accessibility of godowns can help small farmers to avoid distress on a large scale with respect to storage of their farm produce.
- There are no milk collection centres in sample villages of Beed district. Farmers have to travel beyond their villages for sale of milk. The transaction costs involved in transportation of milk from the village to centre are substantial because of the long distance. Three consecutive droughts during last three years have resulted in significant reduction of cattle population. According to the medical officer of the government veterinary hospital in Shirur Kasar, the cattle population has reduced to around one-third of the population compared to that of 2012-13.
- There is no shop available for agricultural inputs within the sample villages.

## A.3. Access to Social Infrastructure

### A.3.1 Housing and Amenities

**Table A-12: Village-wise Availabilities of Household Amenities (Units in %)**

Particulars	Anandgaon (n=250)	Choramba (n=393)	Ambheri (n=450)	Vadi (n=396)	Bholi (n=412)
Household with pucca house	78	75	40	68	90*
Households having electricity connection	24	75	78	88	95
Households with toilet facility	34	75	61	88	90
Households with drinking water tap within house	4	10	62	78	90
Functional handpumps (in number)	0	2	7	10	5
Community toilets (in number)	0	0	0	3	5

Source: Government Records at Village Level

Note: 'n' stands for number of total households in sample villages, \* estimate given by gram sevak.

#### Observations:

- More than three-fourth (75%) of the households in the sample villages of Beed district have access to pucca houses (Table A-12). Also, only 40% of the households have access to pucca houses in Ambheri village. Toilet facilities within the household premises is higher in sample villages in Satara district compared to those in Beed District.
- Sample villages in both the districts have households where toilets are not built completely. Even if the houses have built-in toilets, they are not in usable condition. People are still going for open defecation.

### A.3.2 Drinking Water and Other Health-care Infrastructure

In sample villages of Satara district, it is observed that the availability of drinking water through taps is higher compared to villages in Beed district. It is also observed that the burden of obtaining drinking water is shouldered mostly by young girls.

Accessibility and availability of healthcare infrastructure in sampled villages is presented in Table A-13.



**Table A-13: Distance (in km) to Nearest Healthcare Facility**

Health Facilities	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Hospital	5	9	10	15	18
Private dispensaries	5	9	10	5	8
Primary health centers	5	9	30	5	8
Primary health sub-centers	5	0	3	2	3
Veterinary hospitals	5	9	10	5	5
Medical shops	5	9	10	5	8
Asha workers within village	2	2	2	2	3

Source: Primary Survey

Note: "0" refers that respective healthcare facility exists within the same village.

### Observations:

- Primary health sub-centre (PSC) is available within Choramba village only. While for the rest of the sample villages, there is not any. So, villagers have to access the nearby hospitals and PHC.
- For all the sample villages in both the districts, there are at least two Accredited Social Health Activists (ASHA)<sup>7</sup>.
- Health centres are not having equipment for pathological tests and X-ray diagnostics. For this, households have to travel 45 km to the Beed district headquarters. Similarly, the blood banks are accessible at the Beed district headquarters only.
- For any complications in institutional deliveries, they refer to the district hospital of Beed.
- The cleanliness of PHCs and availability of infrastructure is better in PHC of Pusesavli and Shirwar (Satara Districts) compared to that of Shirur Kasar.

### A.3.3 Educational Infrastructure

All the villages had primary, upper primary and secondary schools (Table A-14). It is only for higher secondary, vocational education and graduation that the youth have to go to the other places to study.

<sup>7</sup> ASHA is trained to advise village population about sanitation, hygiene, contraception, and immunization to provide primary medical care for diarrhoea, minor injuries, and fever and to escort patients to medical centres (Gowrish, 2015, p. 221)

**Table A-14: Distance from Nearest Education Facility (Units in km)**

Educational Facilities	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Anganwadi centres	0	0	0	0	0
Total primary schools	0	0	0	0	0
Total secondary schools	0	0.2	0	0	0
ITI government	40	9	10	10	20
Degree colleges	5	9	18	25	20
Medical/Engineering/Degree college	40	50	50	45	18

Source: Primary Survey

Note: "0" refers that respective education facility exists within the same village.

**Table A-15: Selected Indicators of Infrastructure in Schools of Sample Villages**

Village	School category	Classes taught	No. of students	No. of teachers	Total classroom	Student teacher ratio	Availability of computer	Availability of playground
Anandgaon	Primary	1-5	47	3	3	16	No	No
	Secondary	6-10	200	9	6	22	No	No
Choramba	Primary	1-8	279	10	8	28	Yes	No
	Secondary	8-12	230	12	8	19	Yes	No
Ambheri	Primary	1-7	132	5	5	26	Yes	No
Vadi	Secondary	1-7	132	5	5	26	Yes	No
	Primary	8-10	85	4	3	21	No	No
Bholi	Secondary	5-10	288	7	6	41	Yes	Yes

Source: Primary Survey

**Observations:**

- Schools are available within the village area. However, there is paucity of classrooms. In Anandgaon village school, students of standard one and two are sitting together in a single classroom and standard three and four are sitting together in another classroom.
- The student-teacher ratio is generally in the range of 16-28:1, except in Bholi village, where it is observed as 41:1. In Bholi village, the secondary school is a private government aided school, while rest of the schools in sample villages are Zilla Parishad schools.
- In Satara, schools have digital projectors and white board screens through which students are shown informational videos and movies about social issues. This is not the case with schools of Beed district.
- There is a playground in only one sample school, i.e., in Bholi village. In schools in Anandgaon and Vadi, there are no bulbs or tube lights inside classrooms. In contrast, schools in sample villages of Satara are well-maintained and toilets seems to be in usable condition

## A.4 Access to Institutional Infrastructure

### A.4.1 Banking Services

Village-wise distance to the nearest banking facilities is mentioned in Table A-16.

**Table A-16: Village-wise Distance to the Nearest Banking Facility (Units in km)**

Distance to the Nearest Banking Facility	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Credit Cooperative Society	0	0	0	0	0
Commercial/Cooperative Bank	5	9	10	5	0
ATM for cash withdrawal	5	9	10	5	8

Source: Primary Survey

Note: "0" refers that respective education facility exists within the same village.

### A.4.2 Agricultural Extension

**Table A-17: Availability of SHGs and Fair Price Shops (Units in numbers)**

Availability of SHGs and Fair Price Shops	Anandgaon	Choramba	Ambheri	Vadi	Bholi
Dairy cooperative	0	0	0	0	0
Marketing cooperative	0	0	0	0	0
Self-help-group (number)	2	2	9	12	15
Fair price shop	1	1	1	1	1

Source: Primary Survey

Note: "0" refers that respective education facility exists within the same village.

#### Observations:

- Agricultural extension workers (Agricultural Assistants) are active in dissemination of information about government schemes pertaining to the needs of farmers related to methods of cultivation, disease prevention, etc.
- There are no dairy and marketing cooperatives in the sample regions.
- There is a fair price shop in each village.
- The presence of Self-Help-Groups (SHGs) is higher among the sample villages in Satara district than Beed district (Table A-17).

## A.5 Overall Observations

This case study provides snapshot of insights of ground realities about the rural infrastructure quality of two select districts of Maharashtra in terms of 28 parameters as shown in tabular form in Table A-18. Although the number of sample villages is not sufficient to represent the

respective districts, it can approximate out the true picture and thus can help in validating the variation in access, penetration and outreach of rural infrastructure at unit level. The comparative static analysis of information from primary survey articulates to what extent variance of the infrastructure quality exists between two different study areas.

**Table A-18: Primary Survey Indicators**

Infrastructure Dimension	Area of Infrastructure	Parameters	Satara	Beed
Physical	Agriculture and irrigation	Land utilisation statistics/ cropping intensity	<ul style="list-style-type: none"> <li>Cropping pattern is dominated by Jowar and Sugarcane</li> <li>Cropping Intensity is higher due to the irrigation facilities</li> </ul>	<ul style="list-style-type: none"> <li>Cropping pattern is dominated by Bajra in Kharif and Jowar in Rabi Season.</li> <li>Cropping Intensity is low due to the less rainfall and irrigation facilities</li> </ul>
		Sources and availability of irrigation	<ul style="list-style-type: none"> <li>Better because a greater number of open wells, tube wells, and ponds are available</li> <li>Average rainfall is higher</li> <li>No canals</li> </ul>	<ul style="list-style-type: none"> <li>No canals</li> </ul>
	Electricity	% of rural households with electricity connection	Not all households have electricity connection, but shows a higher number	Not all households have electricity connection
		Total agriculture pump sets energised	All are energised	All are energised
		Supply of electricity for household and agriculture	24 hours a day for household Power Supply for agriculture use in summer: 8 hours	22 hours a day Power Supply for agriculture use in summer: 6 hours
		Number of street lights within villages	Has more street lights, Ambheri being an exception (only 1)	Fewer street lights

Infrastructure Dimension	Area of Infrastructure	Parameters	Satara	Beed
	Transport and mobility	Kind of road connecting village and quality of internal roads	Connected through other district road. Certain stretches of the road connecting taluka headquarters are not in a good condition	Connected through other district road. Certain stretches of the road connecting taluka headquarters are not in a good condition
		Availability and frequency of public transport	MSRTC once in an hour	MSRTC once in an hour
	Communication	Availability of post offices	Sub-post office Ambheri and Bholi village in Satara	Sub-post office at Choramba (Beed District)
	Agricultural marketing	Facilities available within the nearest wholesale market	Basic facilities for farmers lacking viz., drinking water, toilets and cattle shed required in Vaduj APMC	Basic facilities for farmers lacking viz., drinking water, toilets and cattle shed in APMC of Beed and Dharur
		Milk collection centres	Milk collection facility available within the village	No milk collection facility available within the village
		Distance to nearest agricultural input shops	Agricultural input shops are there in the range of 5-10 km	Agricultural input shops are there in the range of 5-10 km
	Storage	Availability of storage and godown	15 km from Ambheri, 30 km from Vadi and 18 km in Bholi	40 km from Anandgaon and 9 km from Choramba

Infrastructure Dimension	Area of Infrastructure	Parameters	Satara	Beed
Social	Amenities	Pucca houses	Lower % of households in Ambheri	Better, as more % of households with Pucca houses in Choramba due to implementation of Government schemes on housing for SC and ST
		Drinking water	Higher % of households had access	<10% of the households had access to drinking water
		Sanitation and drainage facilities	More households have toilets	Lesser households have toilets
	Educational	Student-teacher ratio	Higher ratio	Lower ratio, except primary schools in Choramba
		Number of classrooms	More than Beed but not adequate	Two different standard class students sit together in same class room in Anandgaon village
		Basic facilities in schools	Much better and modernised	Poor quality
	Health	Accessibility to nearest PHC/ Hospital	Closer proximities to Pvt Dispensaries, PHCs, and Primary health Sub-Centers	Closer proximity to hospitals
		Services availability in nearest PHC/ hospital	Cleanliness and availability of infrastructure was better compared to Beed villages	No X-ray diagnostics
	Institutional	Banking	Accessibility to the nearest banking facility	Both have similar scenarios
Cooperation/ Farmers groups		Number of SHGs and fair price shops	Higher presence of SHGs One Fair price shop in each village	One fair price shops in each village
		Access to dairy and marketing cooperative	Milk collection facility within the village No access to dairy cooperative	No milk collection facility within village No access to dairy cooperative
Extension services		Frequency of visits of Agricultural Assistants visits in the village	Twice or thrice in a year	Twice or thrice in a year

Source: Primary Survey

## Appendix B: Report Card of Districts

The report card of districts presents the relative performances of each district on each parameter (physical, social and institutional) with respect to state average. Parameters are categorised into two groups: (1) district performing well on parameters (presented on the left side of the report card table and coloured in light-green) (2) districts performing poorly on the parameters (presented on the right side of report card table and coloured in light-orange). The report card also presents the relative ranking of the districts on each parameter and the top districts' score on that parameter. In addition, recommendations for policy authority for each district is given in bullet points.

**Table B-1 Report Card of Ahmednagar**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	136.64	12	132.9	185.8	Rural HH electrification (%)	68.05	24	74.7	99.3
No of Pumpset per '000 hectare of GCA	22.02	11	21.3	68.4	No. of wholesale market per lakh hectare GCA	0.1	24	0.1	0.4
Irrigation Potential Realised (%)	65.48	10	46.2	107.8	Total storage capacity in MT (per '000 hectares GCA)	3.77	15	6.2	36.6
Per capita power consumption agriculture (KWh)	609.47	2	255.3	695.6	No. of soil testing labs per lakh hectare GCA	0.08	14	0.1	0.3
Pumpsets energised (per '000 GCA)	24.98	6	15.6	31.3					
Tractor registered (per '000 hectares GCA)	3.90	6	2.3	8.9					
Rural road density (km/sq. km)	0.60	10	0.5	1.2					
Access to mobile (%)	58.60	2	42.9	69.6					
<b>Social Infrastructure</b>									
School density per '000 children	14.0	12	13.7	36.6	Rural Literacy Rate (%)	67.35	18	67.8	77.6
Percentage of Schools with more than single teacher	98.7	7	97.4	99.2	Hospitals (per lakh population)	2.64	22	3.1	5.1
Hospital beds (per '000 persons)	0.84	9	0.7	2.3	HH with toilet (%)	46.1	16	47.7	75.9
Institutional deliveries (%)	91.2	15	88.9	100.0					
HH with drinking water facilities (%)	44.98	11	40.5	68.1					
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	68.01	9	61.5	79.6	Crop insurance coverage (% of GCA)	4.01	17	6.9	40.1
No. of Banks (per lakh population)	11.87	9	9.6	25.3	Rural post office (per lakh population)	17.55	16	19.0	48.8
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	34.7	8	23.9	55.1	Total agricultural extension staff (per lakh GCA)	5.72	30	9.0	21.0
PACs (per lakh population)	38.34	9	33.6	70.5	SHG (per lakh population)	3.09	26	5.5	14.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Ahmednagar is doing well in 17 parameters such as cropping intensity, availability of pumpsets, irrigation potential realised, electricity consumption for agricultural purpose, pumpset energised, road connectivity, mobile connectivity, school density, percentage of schools with more than one teacher, availability of beds, institutional deliveries, drinking water facilities, access to bank, ground level credit outlets and PACs
- However, the district is performing poorly in parameters such as: household (HH) electrification, number of wholesale markets, storage capacity, soil testing labs, rural literacy, hospitals, household access to toilet, crop insurance coverage, post office density, agricultural extension staff and self-help groups density.
- Policy priority is required to improve household access to electricity and latrine facilities. Improving availability of wholesale market, storage capacity, soil testing labs, hospitals, coverage of crop insurance, post offices, agricultural extension staff and self-help groups.



Table B-2 Report Card of Akola

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	156.87	5	132.9	185.8	Rural HH electrification (%)	73.35	17	74.7	99.3
					Wholesale market per lakh hectare GCA	0.10	22	0.1	0.4
					Total storage capacity in MT (per '000 hectares GCA)	4.00	14	6.2	36.6
					No. of soil testing labs per lakh hectare GCA	0.06	20	0.1	0.3
					No of Pumpsets per '000 hectare of GCA	11.48	28	21.3	68.4
					Irrigation Potential Realised (%)	29.72	23	46.2	107.8
					Per capita power consumption in agriculture (KWh)	158.81	22	255.3	695.6
					Pumpsets energised (per '000 GCA)	8.35	28	15.6	31.3
					Tractor registered (per '000 hectares GCA)	1.51	20	2.3	8.9
					Rural road density (km/sq. km)	0.17	32	0.5	1.2
					Access to mobile (%)	34.26	25	42.9	69.6
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	98.2	16	97.4	99.2	School density per 1000 children	10.56	23	13.7	36.6
Rural Literacy Rate	75.80	2	67.8	77.6	HH with drinking water facilities (%)	39.65	18	40.5	68.1
					HH with toilet (%)	46.10	17	47.7	75.9
					Hospitals (per lakh population)	2.74	20	3.1	5.1
					Hospital beds (per '000 persons)	0.23	33	0.7	2.3
					Institutional deliveries (%)	83.70	20	88.9	100.0
<b>Institutional Infrastructure</b>									
No. of Banks (per lakh population)	10.23	12	9.6	25.3	HH with banking facility (%)	56.50	28	61.5	79.6
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	25.77	12	23.9	55.1	SHG (per lakh population)	3.10	25	5.5	14.5
PACs (per lakh population)	37.7	12	33.6	70.5	Total agricultural extension staff (per lakh GCA)	6.95	25	9.0	21.0
Crop insurance coverage (% of GCA)	7.53	10	6.9	40.1					
Rural post office (per lakh population)	19.47	10	19.0	48.8					

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Akola is doing well only in eight parameters such as cropping intensity, percentage of schools with more than one teacher, rural literacy rate, number of bank branches, ground level credit outlets, coverage of crop insurance, post office density and PACs.
- The district is performing poorly in as many as 20 parameters.
- Policy thrust should focus for inclusive improvement of all parameters. However, on priority basis, authorities need to improve household access to electricity, banks and latrine, drinking water, road and mobile connectivity and improving the availability of wholesale market, storage capacity, soil testing labs, beds and hospitals, agricultural extension staff and self-help groups.

**Table B-3 Report Card of Amravati**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
					Cropping Intensity (%)	131.00	16	132.9	185.8
					Rural HH electrification (%)	73.14	18	74.7	99.3
					Wholesale markets per lakh hectare GCA	0.12	17	0.1	0.4
					Total storage capacity in MT ('000' hectare GCA)	2.82	20	6.2	36.6
					No. of soil testing labs per lakh hectare GCA	0.06	18	0.1	0.3
					No of Pumpset per '000 hectare of GCA	13.90	23	21.3	68.4
					Irrigation Potential Realised (%)	42.40	16	46.2	107.8
					Per capita power consumption in agriculture (KWh)	225.69	21	255.3	695.6
					Pumpsets energised (per '000 GCA)	12.70	22	15.6	31.3
					Tractor registered (per '000 hectares GCA)	1.40	24	2.3	8.9
					Rural road density (km/sq. km)	0.31	26	0.5	1.2
					Access to mobile (%)	28.00	31	42.9	69.6
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	98.62	8	97.4	99.2	School density per '000 children	12.02	17	13.7	36.6
Rural Literacy Rate	75.67	4	67.8	77.6	Hospitals (per lakh population)	3.03	13	3.1	5.1
HH with drinking water facilities (%)	47.69	9	40.5	68.1	Hospital beds (per '000 persons)	0.70	12	0.7	2.3
HH with toilet (%)	53.70	12	47.7	75.9					
Institutional deliveries (%)	93.70	10	88.9	100.0					
<b>Institutional Infrastructure</b>									
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	24.80	13	23.9	55.1	No. of Banks (per lakh population)	7.94	21	9.6	25.3
Rural post office (per lakh population)	22.58	5	19.0	48.8	Total agricultural extension staff (per lakh GCA)	8.01	19	9.0	21.0
					SHG (per lakh population)	5.29	16	5.5	14.5
					HH with banking facility(%)	51.7	29	61.5	79.6
					Crop insurance coverage (% of GCA)	3.57	18	6.9	40.1
					PACs (per lakh population)	6.23	27	33.6	70.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Amravati is doing well only in seven parameters such as percentage of schools with more than one teacher, rural literacy rate, drinking water facilities, toilet facilities, institutional deliveries, number of ground level credit outlets and post offices.
- The district is performing poorly in as many as 21 parameters such as: cropping intensity, availability of pumpsets, irrigation potential realised, electricity consumption for agricultural purpose, pumpsets energised, road connectivity, mobile connectivity, school density, availability of beds and hospitals, household access to bank, household electrification, number of wholesale markets, storage capacity, soil testing labs, agricultural extension staff, crop insurance coverage, PACs and SHGs density.
- Policy authorities should focus upon all-inclusive improvement of all parameters. However, on priority basis, authorities need to focus on improving household access to electricity and banks, improvement in road and mobile connectivity, and improving availability of schools, irrigation facilities, wholesale market, storage capacity, soil testing labs, beds and hospitals, agricultural extension staff, crop insurance coverage, PACs and SHGs.

Table B-4 Report Card of Aurangabad

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	161.68	4	132.9	185.8	Rural HH electrification (%)	66.91	26	74.7	99.3
Per capita power consumption in agriculture (KWh)	255.88	17	255.3	695.6	No. of wholesale market per lakh hectare GCA	0.09	27	0.1	0.4
Total storage capacity in MT ('000' GCA)	6.06	8	6.2	36.6	No. of soil testing labs per lakh hectare GCA	0.03	32	0.1	0.3
Rural road density (km/sq. km)	0.50	15	0.5	1.2	No of Pumpset per '000 hectare of GCA	18.53	15	21.3	68.4
Access to mobile (%)	56.30	5	42.9	69.6	Irrigation Potential Realised (%)	37.11	18	46.2	107.8
Pumpsets energised (per '000 GCA)	20.08	8	15.6	31.3	Tractor registered (per '000 hectares GCA)	2.04	15	2.3	8.9
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	98.43	10	97.4	99.2	Rural Literacy Rate	62.15	28	67.8	77.6
Institutional deliveries (%)	89.50	19	88.9	100.0	School density per '000 children	9.36	28	13.7	36.6
HH with toilet (%)	48.90	14	47.7	75.9	HH with drinking water facilities (%)	39.68	17	40.5	68.1
					Hospitals (per lakh population)	2.40	33	3.1	5.3
					Hospital beds (per '000 persons)	0.57	19	0.7	2.3
<b>Institutional Infrastructure</b>									
No. of Banks (per lakh population)	9.80	14	9.6	25.3	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	18.50	18	23.9	55.1
HH with banking facility (%)	62.05	19	61.5	79.6	SHG (per lakh population)	2.84	30	5.5	14.5
					Total agricultural extension staff (per lakh GCA)	6.10	28	9.0	21.0
					Crop insurance coverage (% of GCA)	2.29	22	6.9	40.1
					PACs (per lakh population)	33.49	24	33.6	70.5
					Rural post office (per lakh population)	15.18	24	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Aurangabad is doing well only in 11 parameters, mostly in physical infrastructure such as cropping intensity, electricity consumption for agricultural purpose, pumpset energised, road and mobile connectivity, schools with more than one teacher, toilet facilities, bank branches and households with banking facilities.
- The district is performing poorly in rest of the parameters.
- Policy authorities should focus on all round improvement of all parameters, especially electrified household, irrigation facilities, availability of wholesale market and soil testing labs, literacy rate, school density, number of teachers, access to drinking water, ground level staff, PACs, coverage of insurance, etc.

Table B-5 Report Card of Beed

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	133.11	14	132.9	185.8	Rural HH electrification (%)	71.22	21	74.7	99.3
Per capita power consumption in agriculture (KWh)	441.43	5	255.3	695.6	No. of wholesale market per lakh hectare GCA	0.10	25	0.1	0.4
Pumpsets energised (per '000 GCA)	15.89	14	15.6	31.3	Total storage capacity in MT ( '000' hectare GCA)	1.50	30	6.2	36.6
Rural road density (km/ sq. km)	0.64	8	0.5	1.2	No. of soil testing labs per lakh hectare GCA	0.03	31	0.1	0.3
Access to mobile (%)	54.57	6	42.9	69.6	No of Pumpset per '000 hectare of GCA	12.18	27	21.3	68.4
					Irrigation Potential Realised (%)	12.94	28	46.2	107.8
					Tractor registered (per '000 hectares GCA)	1.15	25	2.3	8.9
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	99.23	1	97.4	99.2	Rural Literacy Rate	64.5	25	67.8	77.6
Institutional deliveries (%)	97.50	2	88.9	100.0	Hospitals (per lakh population)	2.41	31	3.1	5.1
School density per '000 children	15.14	8	13.7	36.6	Hospital beds (per '000 persons)	0.64	13	0.7	2.3
					HH with drinking water facilities(%)	31.60	27	40.5	68.1
					HH with toilet (%)	25.1	33	47.7	75.9
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	67.76	11	61.5	79.6	No. of Banks (per lakh population)	5.26	29	9.6	25.3
Crop insurance coverage (% of GCA)	7.13	10	6.9	40.1	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	15.26	24	23.9	55.1
PACs (per lakh population)	35.49	14	33.6	70.5	SHG (per lakh population)	3.44	24	5.5	14.5
					Total agricultural extension staff (per lakh GCA)	5.63	31	9.0	21.0
					Rural post office (per lakh population)	15.16	25	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Beed is doing well only in 11 parameters, mostly in physical infrastructure such as cropping Intensity electricity consumption for agricultural purpose, pumpsets energised, road and mobile connectivity, school density, schools with more than one teacher, institutional deliveries, PACs, access to banks and crop insurance coverage.
- The district is performing poorly in the rest of the parameters.
- Policy authorities should focus on all round improvement of all parameters as this district is lagging in several parameters.

Table B-6 Report Card of Bhandara

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	142.43	7	132.9	185.8	Total storage capacity in MT (per '000 hectares GCA)	4.09	13	6.2	36.6
Rural HH electrification (%)	78.81	11	74.7	99.3	No. of soil testing labs per lakh hectare GCA	0.08	12	0.1	0.3
No. of wholesale market per lakh hectare GCA	0.20	8	0.1	0.4	Per capita power consumption in agriculture (KWh)	158.53	23	255.3	695.6
No of Pumpset per '000 GCA	28.14	9	21.3	68.4	Access to mobile (%)	36.29	23	42.9	69.6
Pumpsets energised (per '000 GCA)	15.76	15	15.6	31.3					
Irrigation Potential Realised (%)	64.08	11	46.2	107.8					
Tractor registered (per '000 GCA)	3.49	6	2.3	8.9					
Rural road density (km/sq. km)	0.63	9	0.5	1.2					
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	99.15	2	97.4	99.2	HH with drinking water facilities (%)	32.29	24	40.5	68.1
Rural Literacy Rate	73.29	6	67.8	77.6	Hospital beds (per '000 persons)	0.60	16	0.7	2.3
School density per '000 children	14.99	9	13.7	36.6	Institutional deliveries (%)	57.42	23	88.9	100.0
Hospitals (per lakh population)	3.41	7	3.1	5.1					
HH with toilet (%)	61.20	10	47.7	75.9					
<b>Institutional Infrastructure</b>									
No. of Banks (per lakh population)	9.93	13	9.6	25.3	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	19.66	16	23.9	55.1
SHG (per lakh population)	10.61	3	5.5	14.5	HH with banking facility (%)	57.42	23	61.5	79.6
PACs (per lakh population)	38.28	10	33.6	70.5	Total agricultural extension staff (per lakh GCA)	8.77	12	9.0	21.0
					Crop insurance coverage (% of GCA)	4.86	14	6.9	40.1
					Rural post office (per lakh population)	13.76	29	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Bhandara is doing well in 16 parameters such as cropping intensity, availability of pumpsets, pumpsets energised, irrigation potential realised, tractors, electrified households, road density, wholesale markets, school density, schools with more than one teacher, literacy rate, hospitals, access to toilets, SHGs and PACs.
- The district is performing poorly in rest of the parameters such as: electricity consumption for agricultural purpose, storage capacity, soil testing labs, mobile connectivity, drinking water facilities, hospital beds, institutional deliveries, access to bank, ground level credit outlets and crop insurance coverage.
- Policy thrust should focus on improving parameters such as: power consumption for agricultural purpose, storage capacity, soil testing labs, mobile connectivity, drinking water facilities, hospital beds, institutional deliveries, access to bank, ground level credit outlets and crop insurance coverage.

**Table B-7 Report Card of Buldhana**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Per capita power consumption in agriculture (KWh)	270.34	14	255.3	695.6	Rural HH electrification (%)	72.43	19	74.7	99.3
Pumpsets energised (per '000 GCA)	16.45	13	15.6	31.3	No. of wholesale market per lakh hectare GCA	0.14	15	0.1	0.4
Access to mobile (%)	43.66	16	42.9	69.6	Total storage capacity in MT (per '000 hectares GCA)	2.27	26	6.2	36.6
Cropping Intensity (%)	139.79	9	132.9	185.8	No. of soil testing labs per lakh hectare GCA	0.03	30	0.1	0.3
Irrigation Potential Realised (%)	49.72	15	46.2	107.8	No of Pumpset per '000 hectare of GCA	17.42	17	21.3	68.4
					Tractor registered (per '000 hectares GCA)	2.02	16	2.3	8.9
					Rural road density (km/sq. km)	0.13	33	0.5	1.2
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	98.16	15	97.4	99.2	School density per '000 children	10.15	26	13.7	36.6
Rural Literacy Rate	71.21	12	67.8	77.6	Hospital beds (per '000 persons)	0.64	14	0.7	2.3
Institutional deliveries (%)	90.70	18	88.9	100.0	HH with drinking water facilities (%)	39.89	15	40.5	68.1
					Hospitals (per lakh population)	2.55	26	3.1	5.1
					HH with toilet (%)	35.30	23	47.7	75.9
<b>Institutional Infrastructure</b>									
Crop insurance coverage (% of GCA)	30.33	02	6.9	40.1	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	14.82	25	23.9	55.1
					PACs (per lakh population)	27.83	26	33.6	70.5
					Rural post office (per lakh population)	16.44	21	19.0	48.8
					Total agricultural extension staff (per lakh GCA)	8.23	16	9.0	21.0
					No. of Banks (per lakh population)	5.99	26	9.6	25.3
					HH with banking facility (%)	60.85	20	61.5	79.6
					SHG (per lakh population)	2.98	28	5.5	14.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Buldhana is doing well only in nine parameters such as cropping intensity, electricity consumption for agricultural purpose, pumpset energised, mobile connectivity, irrigation potential realised, rural literacy rate, schools with more than one teacher, institutional deliveries and crop insurance coverage.
- The district is performing poorly in rest of the parameters.
- Policy authorities should focus on all round improvement of all parameters. However, policy thrust should focus on improving parameters such as: road density, number of wholesale markets, storage capacity, soil testing labs, number of schools, drinking water facilities, number of hospitals and beds, access to bank, PACs, SHGs, and ground level credit outlets.

**Table B-8 Report Card of Chandrapur**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
No. of wholesale market per lakh hectare GCA	0.24	4	0.1	0.4	Cropping Intensity (%)	116.65	26	132.9	185.8
Irrigation Potential Realised (%)	57.99	12	46.2	107.8	Rural HH electrification (%)	71.32	20	74.7	99.3
					Total storage capacity in MT (per '000 hectares GCA)	3.10	18	6.2	36.6
					No. of soil testing labs per lakh hectare GCA	0.06	22	0.1	0.3
					No of Pumpset per '000 hectare of GCA	13.78	25	21.3	68.4
					Percapita power consumption in agriculture (KWh)	49.83	29	255.3	695.6
					Pumpsets energised (per '000 GCA)	7.71	30	15.6	31.3
					Tractor registered (per '000 hectares GCA)	2.00	17	2.3	8.9
					Rural road density (km/sq. km)	0.30	27	0.5	1.2
					Access to mobile (%)	29.51	30	42.9	69.6
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	97.97	17	97.4	99.2	Rural Literacy Rate	67.35	17	67.8	77.6
School density per '000 children	14.59	10	13.7	36.6	Hospital beds (per '000 persons)	0.44	24	0.7	2.3
Hospitals (per lakh population)	4.06	5	3.1	5.1	Institutional deliveries (%)	86.80	22	88.9	100.0
					HH with drinking water facilities (%)	26.06	32	40.5	68.1
					HH with toilet (%)	43.30	18	47.7	75.9
<b>Institutional Infrastructure</b>									
No. of Banks (per lakh population)	9.80	15	9.6	25.3	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	17.22	20	23.9	55.0
HH with banking facility (%)	64.69	14	61.5	79.6	PACs (per lakh population)	27.64	27	33.6	70.5
SHG (per lakh population)	6.61	10	5.5	14.5	Total agricultural extension staff (per lakh GCA)	8.47	14	9.0	21.0
Rural post office (per lakh population)	21.76	6	19	48.8	Crop insurance coverage (% of GCA)	0.84	26	6.9	40.0

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Chandrapur is doing well only in seven parameters such as irrigation potential realised, wholesale market, school density, schools with more than single teacher, hospitals, households with banking facilities and bank branches, SHGs and post offices.
- The district is performing poorly in rest of the parameters.
- Policy authorities should focus on comprehensive improvement of all parameters, especially improving physical and social infrastructure.

Table B-9 Report Card of Dhule

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Tractor registered (per '000 hectares GCA)	3.13	8	2.3	8.9	Cropping Intensity (%)	125.70	20	132.9	185.8
Pumpsets energised (per '000 GCA)	16.53	12	15.6	31.3	Irrigation Potential Realised (%)	18.29	26	46.2	107.8
Rural HH electrification (%)	99.23	1	74.7	99.3	Wholesale markets per lakh hectare GCA	0.07	30	0.1	0.4
Total storage capacity in MT (per '000 hectares GCA)	11.10	5	6.2	36.6	No. of soil testing labs per lakh hectare GCA	0.07	16	0.1	0.3
Per capita power consumption in agriculture (KWh)	321.96	10	255.3	695.7	Pumpsets per '000 hectare of GCA	8.34	31	21.3	68.4
					Rural road density (km/sq. km)	0.47	18	0.5	1.2
					Access to mobile (%)	35.36	24	42.9	69.6
<b>Social Infrastructure</b>									
% of Schools with more than single teacher	98.30	11	97.4	99.2	School density per '000 children	10.45	24	13.7	36.6
HH with drinking water facilities (%)	53.40	5	40.5	68.1	Hospitals (per lakh population)	2.77	18	3.1	5.1
					Rural Literacy Rate	57.94	32	67.8	77.6
					Hospital beds (per '000 persons)	0.46	23	0.7	2.3
					HH with toilet (%)	31.20	27	47.7	75.9
					Institutional deliveries (%)	79.60	31	88.9	100.0
<b>Institutional Infrastructure</b>									
					No. of Banks (per lakh population)	7.43	22	9.6	25.3
					Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	17.98	19	23.9	55.1
					PACs (per lakh population)	27.84	25	33.6	70.5
					HH with banking facility (%)	38.59	32	61.5	79.6
					SHG (per lakh population)	2.81	31	5.5	14.5
					Total agricultural extension staff (per lakh GCA)	6.16	27	9.0	21.0
					Rural post office (per lakh population)	1.28	33	19.0	48.8
					Crop insurance coverage (% of GCA)	1.17	24	6.9	40.1

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Dhule is doing well only in seven parameters such as tractors registered, electricity consumption for agricultural purpose, pumpsets energised, electrified household, storage capacity, schools with more than one teacher and households with drinking water facilities.
- The district is performing poorly with respect to rest of the parameters.
- Policy authorities should focus on all round improvement of all parameters, especially social and institutional infrastructure.



**Table B-10 Report Card of Gadchiroli**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
No. of wholesale market per lakh hectare GCA	0.24	5	0.1	0.4	Cropping Intensity (%)	122.20	24	132.9	185.8
Irrigation Potential Realised (%)	79.39	6	46.2	107.8	Rural HH electrification (%)	54.47	32	74.7	99.3
Tractor registered (per '000 hectares GCA)	2.48	12	2.3	8.9	Total storage capacity in MT (per '000 hectares GCA)	3.87	15	6.2	36.6
					No. of soil testing labs per lakh hectare GCA	0.05	24	0.1	0.3
					No of Pumpset per '000 hectare of GCA	14.53	20	21.3	68.4
					Per capita power consumption in agriculture (KWh)	73.87	27	255.3	695.6
					Pumpsets energised (per '000 GCA)	6.63	31	15.6	31.3
					Rural road density (km/sq. km)	0.18	31	0.5	1.2
					Access to mobile (%)	21.84	32	42.9	69.6
<b>Social Infrastructure</b>									
School density per '000 children	25.21	3	13.7	36.6	% of Schools with more than single teacher	96.94	27	97.4	99.2
Hospitals (per lakh population)	4.71	3	3.1	5.1	Rural Literacy Rate	64.28	26	67.8	77.6
Hospital beds (per '000 persons)	1.07	7	0.7	2.3	HH with drinking water facilities (%)	21.05	33	40.5	68.1
					HH with toilet (%)	27.00	32	47.7	75.9
					Institutional deliveries (%)	77.10	32	88.9	100.0
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	75.26	4	61.5	79.6	No. of Banks (per lakh population)	8.27	20	9.6	25.3
SHG (per lakh population)	11.67	2	5.5	14.5	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	12.46	30	23.9	55.1
Total agricultural extension staff (per lakh GCA)	13.66	4	9.0	21.0	PACs (per lakh population)	26.60	30	33.6	70.5
Crop insurance coverage (% of GCA)	7.92	8	6.9	40.1					
Rural post office (per lakh population)	19.27	11	19.0	48.8					

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Gadchiroli is doing well in 11 parameters such as wholesale markets, irrigation potential realised, tractors, school density, hospitals and beds, access to banking facility, SHGs and agricultural extension staff, crop insurance coverage, and rural post offices.
- The district is performing poorly in rest of the parameters.
- Policy authorities should focus on improving cropping intensity, rural electrification, rural road and mobile connectivity, access to soil testing labs, number of school teachers, rural literacy, access to drinking water and toilet facilities, institutional deliveries, number of banks, ground level credit outlets and PACs.

Table B-11 Report Card of Gondia

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
No of Pumpset per '000 hectare of GCA	34.48	5	21.3	68.4	Cropping Intensity (%)	132.7	15	132.9	185.8
Irrigation Potential Realised (%) (%)	73.25	7	46.2	107.8	Per capita power consumption in agriculture (KWh)	94.02	26	255.3	695.7
Rural HH electrification (%)	80.48	9	74.7	99.2	Pumpsets energised (per '000 GCA)	10.65	26	15.6	31.3
Rural road density (km/sq. km)	0.58	12	0.5	1.2	Access to mobile (%)	36.52	21	42.9	69.3
Tractor registered (for '000 ha GCA)	2.57	10	2.3	8.2	No. of soil testing labs per lakh hectare GCA	0.04	26	0.1	0.0
No. of wholesale market per lakh hectare GCA	0.29	2	0.1	0.4					
Total storage capacity (MT for '000 ha GCA)	36.58	1	6.2	36.6					
<b>Social Infrastructure</b>									
Rural Literacy Rate	74.63	5	67.8	77.6	Hospital beds (per '000 persons)	0.53	20	0.7	2.3
School density per '000 children	16.26	6	13.7	36.6	Institutional deliveries (%)	84.20	25	88.9	100.0
Percentage of Schools with more than single teacher	99.14	3	97.4	99.2	HH with drinking water facilities (%)	27.23	31	40.5	68.1
Hospitals (per lakh population)	3.56	6	3.1	5.1					
HH with toilet (%)	52.40	13	47.7	75.9					
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	70.01	7	61.5	79.6	No. of Banks (per lakh population)	7.20	24	9.6	25.3
SHG (per lakh population)	7.97	5	5.5	14.5	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	13.95	27	23.9	55.1
Total agricultural extension staff (per lakh GCA)	11.98	6	9.0	21.0	Rural post office (per lakh population)	14.86	27	19.0	48.7
					Crop insurance coverage (% of GCA)	4.17	15	6.9	40.1
					PACs (per lakh population)	30.00	23	33.6	70.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Gondia is doing well in 15 parameters such as pumpsets, irrigation potential realised, electrified household, road density, tractor, wholesale markets, warehouse and storage capacity, literacy rate, school density, schools with more than one teacher, access to latrine, hospitals, access to bank, SHGs and agricultural extension staff.
- The district is performing poorly in rest of the parameters.
- Policy authorities should focus on improving parameters such as: availability of power for agricultural purpose, pumpsets energised, mobile connectivity, soil testing labs, number of beds, access to drinking water, institutional deliveries, number of bank branches, number of ground level credit outlets, PACs and coverage of crop insurance.

**Table B-12 Report Card of Hingoli**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	175.03	2	132.9	185.8	Rural road density (km/sq. km)	0.40	23	0.5	1.2
Irrigation Potential Realised (%)	73.15	8	46.2	107.8	Tractor registered (for '000 ha GCA)	1.11	26	2.3	8.2
Per capita power consumption in agriculture (KWh)	448.85	4	255.3	695.7	Pumpsets energised (per '000 GCA)	12.38	23	15.6	31.3
Access to mobile (%)	53.21	7	42.9	69.3	Total storage capacity (MT for '000 ha GCA)	0.41	32	6.2	36.6
					Wholesale markets (per lakh ha of GCA)	0.12	18	0.1	0.4
					No. of soil testing labs per lakh hectare GCA	0.03	29	0.1	0.3
					No of Pumpset per '000 hectare of GCA	14.50	21	21.3	68.4
					Rural HH electrification (%)	66.05	27	74.7	99.2
<b>Social Infrastructure</b>									
Percentage of Schools with more than single teacher	98.24	13	97.4	99.2	Rural Literacy Rate	65.91	21	67.8	77.6
Institutional deliveries (%)	91.00	17	88.9	100.0	School density per '000 children	10.81	22	13.7	36.6
					Hospital beds (per '000 persons)	0.33	31	0.7	2.3
					Hospitals (per lakh population)	2.40	32	3.1	5.1
					HH with drinking water facilities (%)	32.19	25	40.5	68.1
					HH with toilet (%)	32.40	26	47.7	75.9
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	67.34	12	61.5	79.6	No. of Banks (per lakh population)	3.10	32	9.6	25.3
PACs (per lakh population)	41.36	4	33.6	70.5	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	12.52	29	23.9	55.1
Crop insurance coverage (% of GCA)	12.96	5	6.9	40.1	SHG (per lakh population)	3.80	21	5.5	14.5
					Rural post office (per lakh population)	10.82	31	19.0	48.7
					Total agricultural extension staff (per lakh GCA)	5.17	33	9.0	21.0

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Hingoli is doing well only in 11 parameters such as cropping intensity, irrigation potential realised, electricity consumption for agriculture, mobile connectivity, institutional deliveries, schools with more than one teacher, access to bank, PACs and crop insurance coverage.
- The district is performing poorly in rest of the parameters.
- Policy action should focus on improving parameters such as road density, pumpsets energised, storage capacity, number of wholesale markets, soil testing labs, number of hospitals and beds, access to drinking water and toilet facilities, number of bank branches and post offices, number of ground level credit outlets, SHGs and number of agricultural extension staff.

**Table B-13 Report Card of Jalgaon**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	136.94	10	132.9	185.8	No of Pumpset per '000 hectare of GCA	16.76	18	21.3	68.4
Per capita power consumption in agriculture (KWh)	427.47	6	255.3	695.7	Irrigation Potential Realised (%)	18.49	25	46.2	107.8
Rural road density (km/ sq. km)	0.55	13	0.5	1.2	Wholesale markets (per lakh ha of GCA)	0.10	23	0.1	0.4
Tractor registered (for '000 ha GCA)	2.55	11	2.3	8.2	Access to mobile (%)	32.12	27	42.9	69.3
Pumpsets energised (per '000 GCA)	16.70	11	15.6	31.3	No. of soil testing labs per lakh hectare GCA	0.07	15	0.1	0.3
					Rural HH electrification (%)	74.24	15	74.7	99.2
					Total storage capacity (MT for '000 ha GCA)	5.21	10	6.2	36.6
<b>Social Infrastructure</b>									
HH with drinking water facilities (%)	58.22	4	40.5	68.1	Rural Literacy Rate	65.03	23	67.8	77.6
Percentage of Schools with more than single teacher	99.14	3	97.4	99.2	School density per '000 children	8.49	31	13.7	36.6
					Hospital beds (per '000 persons)	0.46	22	0.7	2.3
					Hospitals (per lakh population)	2.66	21	3.1	5.1
					Institutional deliveries (%)	82.40	29	88.9	100.0
					HH with toilet (%)	35.50	22	47.7	75.9
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	70.01	7	61.5	79.6	No. of Banks (per lakh population)	7.20	24	9.6	25.3
SHG (per lakh population)	7.97	5	5.5	14.5	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	13.95	27	23.9	55.1
Total agricultural extension staff (per lakh GCA)	11.98	6	9.0	21.0	Rural post office (per lakh population)	14.86	27	19.0	48.7
					Crop insurance coverage (% of GCA)	4.17	15	6.9	40.1
					PACs (per lakh population)	30.00	23	33.6	70.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange)

- Jalgaon is doing well only in 10 parameters such as cropping intensity, electricity consumption for agriculture, tractor, pumpsets energised, road connectivity, warehouse, schools with more than single teacher, access to drinking water, households with banking facility, extension staff and SHGs.
- The district is performing poorly in rest of the parameters, particularly in social and institutional infrastructure.
- Policy action should focus on improving parameters such as irrigation facilities, mobile density, number of wholesale markets, number of soil testing labs, literacy rate, number of hospitals and beds, toilet facilities, institutional deliveries, number of bank branches and post offices, number of ground level credit outlets, crop insurance coverage and PACs.

Table B-14 Report Card of Jalna

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	152.95	6	132.9	185.8	Irrigation Potential Realised (%)	34.79	21	46.2	107.8
No of Pumpset per '000 hectare of GCA	25.86	10	21.3	68.4	Rural HH electrification (%)	69.79	22	74.7	99.2
Per capita power consumption in agriculture (KWh)	293.2	12	255.3	695.7	Rural road density (km/sq. km)	0.42	22	0.5	1.2
Access to mobile (%)	47.27	14	42.9	69.3	Tractor registered (for '000 ha GCA)	1.49	23	2.3	8.2
					Pumpsets energised (per '000 GCA)	13.91	19	15.6	31.3
					Wholesale markets (per lakh ha of GCA)	0.09	29	0.1	0.4
					Total storage capacity (MT for '000 ha GCA)	2.69	21	6.2	36.6
					No. of soil testing labs per lakh hectare GCA	0.00	25	0.1	0.0
<b>Social Infrastructure</b>									
Percentage of Schools with more than single teacher	97.97	18	97.4	99.2	Rural Literacy Rate	58.90	31	67.8	77.6
					School density per '000 children	11.37	20	13.7	36.6
					Hospital beds (per '000 persons)	0.43	25	0.7	2.3
					Hospitals (per lakh population)	2.53	28	3.1	5.1
					Institutional deliveries (%)	82.50	28	88.9	100.0
					HH with drinking water facilities (%)	32.65	23	40.5	68.1
					HH with toilet (%)	36.50	21	47.7	75.9
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	67.84	10	61.5	79.6	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	20.04	14	23.9	55.1
No. of Banks (per lakh population)	15.68	2	9.6	25.3	Rural post office (per lakh population)	10.37	32	23.9	0.6
SHG (per lakh population)	7.20	6	5.5	14.5	Total agricultural extension staff (per lakh GCA)	5.39	32	9.0	21.0
PACs (per lakh population)	35.22	15	33.6	70.5	Crop insurance coverage (% of GCA)	6.56	13	6.9	40.1

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Jalna has done well only in nine parameters such as cropping intensity, electricity consumption for agriculture, number of pumpsets, mobile connectivity, schools with more than single teacher, bank branches, households with banking facility, SHGs and PACs.
- The district is performing poorly in rest of the parameters, particularly in social and institutional infrastructure.
- Policy authorities should focus on all round improvement of all parameters, especially improving parameters like irrigation facilities, electrified households, road density, storage capacity, number of soil testing labs, literacy rate, number of schools, number of hospitals and beds, access to drinking water and toilet facilities, number of ground level credit outlets, post offices, crop insurance coverage and agricultural extension staff.

Table B-15 Report Card of Kolhapur

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	136.83	11	132.9	185.8	Per capita power consumption in agriculture (KWh)	145.85	24	255.3	695.7
No of Pumpset per '000 hectare of GCA	54.12	2	21.3	68.4	Wholesale markets (per lakh ha of GCA)	0.07	31	0.1	0.4
Irrigation Potential Realised (%)	92.51	3	46.2	107.8					
Rural HH electrification (%)	90.19	5	74.7	99.2					
Rural road density (km/sq. km)	0.54	14	0.5	1.2					
Tractor registered (for '000 ha GCA)	5.88	2	2.3	8.2					
Pumpsets energised (per '000 GCA)	22.47	7	15.6	31.3					
Total storage capacity (MT for '000 ha GCA)	25.08	2	6.2	36.6					
Access to mobile (%)	50.41	12	42.9	69.3					
No. of soil testing labs per lakh hectare GCA	0.17	6	0.1	0.3					
<b>Social Infrastructure</b>									
Rural Literacy Rate	70.06	15	67.8	77.6	School density per '000 children	11.49	19	13.7	36.5
Percentage of Schools with more than single teacher	98.87	6	97.4	99.2	Hospitals (per lakh population)	2.76	19	3.1	5.1
Hospital beds (per '000 persons)	2.31	1	0.7	2.3					
Institutional deliveries (%)	96.10	4	88.9	100.0					
HH with drinking water facilities(%)	68.11	1	40.5	68.1					
HH with toilet (%)	74.50	3	47.7	75.9					
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	75.72	3	61.5	79.6	Crop insurance coverage (% of GCA)	2.36	21	6.9	40.1
No. of Banks (per lakh population)	11.53	10	9.6	25.3					
Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	42.10	4	23.9	55.1					
PACs (per lakh population)	70.52	1	33.6	70.52					
SHG (per lakh population)	6.07	12	5.5	14.5					
Rural post office (per lakh population)	19.54	9	19.0	48.7					
Total agricultural extension staff (per lakh GCA)	9.53	8	9.0	21.0					

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Kolhapur has done well in all parameters except electricity consumption for agriculture, wholesale market, school density, availability of hospitals and coverage of crop insurance.
- Policy authorities should focus action plan for improving electricity consumption for agriculture, wholesale market, school density, availability of hospitals and coverage of crop insurance.

Table B-16 Report Card of Latur

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	133.94	13	132.9	185.8	No of Pumpset per '000 hectare of GCA	20.00	13	21.3	68.4
Rural HH electrification (%)	75.32	14	74.7	99.2	Irrigation Potential Realised (%)	8.54	31	46.2	107.8
Pumpsets energised (per '000 GCA)	16.92	10	15.6	31.3	Rural road density (km/sq. km)	0.47	19	0.5	1.2
Wholesale markets (per lakh ha of GCA)	0.15	12	0.1	0.4	Tractor registered (for '000 ha GCA)	1.65	19	2.3	8.2
Access to mobile (%)	50.72	10	42.9	69.3	Total storage capacity (MT for '000 ha GCA)	1.70	28	6.2	36.6
Per capita power consumption in agriculture (KWh)	328.96	9	255.3	695.7	No. of soil testing labs per lakh hectare GCA	0.04	27	0.1	0.3
<b>Social Infrastructure</b>									
Institutional deliveries (%)	95.50	5	88.9	100.0	Rural Literacy Rate	65.32	22	67.8	77.6
					School density per '000 children	10.40	25	13.7	36.6
					Percentage of Schools with more than single teacher	97.50	23	97.4	99.2
					Hospital beds (per '000 persons)	0.42	26	0.7	2.3
					Hospitals (per lakh population)	2.51	29	3.1	5.1
					HH with drinking water facilities (%)	38.79	19	40.5	68.1
					HH with toilet (%)	37.60	20	47.7	75.9
<b>Institutional Infrastructure</b>									
Crop insurance coverage (% of GCA)	29.06	3	6.9	40.1	HH with banking facility (%)	63.85	15	61.5	79.6
					No. of Banks (per lakh population)	8.47	19	9.6	25.3
					Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	16.18	22	23.9	55.1
					PACs (per lakh population)	32.09	20	33.6	70.5
					SHG (per lakh population)	3.90	20	5.5	14.5
					Rural post office (per lakh population)	15.09	26	19.0	48.7
					Total agricultural extension staff (per lakh GCA)	8.15	17	9.0	21.0

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Latur has done well only in eight parameters such as cropping intensity, electrified households, pumpsets energised, wholesale market, mobile connectivity, per capita power consumption in agriculture, institutional deliveries and crop insurance coverage.
- The district is performing poorly in rest of the parameters, particularly in social and institutional infrastructure.
- Policy authorities should focus for all round improvement of all parameters, especially improving social and institutional infrastructure.

**Table B-17 Report Card of Nagpur**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Irrigation Potential Realised (%)	82.19	5	46.2	107.8	Cropping Intensity (%)	117.46	25	132.9	185.8
Rural HH electrification (%)	78.71	12	74.7	99.2	No of Pumpset per '000 hectare of GCA	17.57	16	21.34	68.4
Tractor registered (for '000 ha of GCA)	2.40	14	2.3	8.2	Per capita power consumption in agriculture (KWh)	69.18	28	255.3	695.7
Wholesale markets (per lakh ha of GCA)	0.20	7	0.1	0.4	Rural road density (km/sq. km)	0.38	24	0.5	1.2
No. of soil testing labs per lakh hectare GCA	0.10	10	0.1	0.3	Pumpsets energised (per '000 GCA)	13.67	20	15.6	31.3
					Total storage capacity (MT for '000 ha GCA)	3.11	17	6.2	36.6
					Access to mobile (%)	31.63	28	42.9	69.26
<b>Social Infrastructure</b>									
Rural Literacy Rate	72.75	8	67.8	77.6	School density per '000 children	8.82	30	13.7	36.6
Percentage of Schools with more than single teacher	98.25	12	97.4	99.2					
Hospital beds (per '000 persons)	1.19	6	0.7	2.3					
Hospitals (per lakh population)	3.32	8	3.1	5.1					
Institutional deliveries (%)	95.20	8	88.9	100.0					
HH with drinking water facilities (%)	47.37	10	40.5	68.1					
HH with toilet (%)	75.70	2	47.7	75.9					
<b>Institutional Infrastructure</b>									
No. of Banks (per lakh population)	14.24	6	9.6	25.3	HH with banking facility (%)	63.27	17	61.5	79.6
Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	40.62	5	23.9	55.1	Rural post office (per lakh population)	17.76	15	19.0	48.8
PACs (per lakh population)	39.80	5	33.6	70.5	Total agricultural extension staff (per lakh GCA)	8.13	18	9.0	21.0
SHG (per lakh population)	5.87	13	5.5	14.5	Crop insurance coverage (% of GCA)	1.96	23	6.9	40.1

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Nagpur has done well in 16 parameters such as irrigation potential realised, electrified households, tractors registered, wholesale market, soil testing lab, rural literacy, schools with more than single teacher, hospitals and beds, households with toilet and drinking water facilities, institutional deliveries, bank branches, PACs, SHGs and ground level credit outlets.
- The district is performing poorly in rest of the parameters, particularly in physical and institutional infrastructure.
- Policy authorities should focus on improving parameters such as cropping intensity, irrigation facilities, pumpsets, power consumption for agricultural purpose, rural road and mobile connectivity, number of warehouses, school density, households with banking facilities, post offices, number of extension staff and crop insurance coverage.



**Table B-18 Report Card of Nanded**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
No of Pumpset per '000 hectare of GCA	23.38	12	21.3	68.4	Cropping Intensity (%)	122.35	23	132.9	185.8
Access to mobile (%)	47.84	13	42.9	69.6	Rural HH electrification (%)	67.24	25	74.7	99.3
No. of wholesale market per lakh hectare GCA	0.22	6	0.1	0.4	Total storage capacity in MT (per '000 hectares GCA)	0.95	31	6.2	36.6
No. of soil testing labs per lakh hectare GCA	0.06	17	0.1	0.3	Irrigation Potential Realised (%)	35.05	19	46.2	107.8
					Per capita power consumption in agriculture (KWh)	249.37	19	255.3	695.6
					Pumpsets energised (per '000 GCA)	14.34	17	15.6	31.3
					Tractor registered (per '000 hectares GCA)	0.77	31	2.3	8.9
					Rural road density ('000 km/sq. km)	0.47	16	0.5	1.2
<b>Social Infrastructure</b>									
					Rural Literacy Rate	62.49	27	67.8	77.6
					School density per '000 children	10.82	21	13.7	36.6
					Percentage of Schools with more than single teacher	96.71	28	97.4	99.2
					HH with drinking water facilities(%)	27.84	29	40.5	68.1
					HH with toilet (%)	33.10	25	47.7	75.9
					Hospitals (per lakh population)	2.57	25	3.1	5.1
					Hospital beds (per '000 persons)	0.59	17	0.7	2.3
					Institutional deliveries (%)	81.30	30	88.9	100.0
<b>Institutional Infrastructure</b>									
PACs (per lakh population)	39.55	6	33.6	70.5	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	12.4	31	23.9	55.1
HH with banking facility (%)	63.31	16	61.5	79.6	No. of Banks (per lakh population)	5.39	28	9.6	25.3
					HH with banking facility (%)	43.94	31	61.5	79.6
					SHG (per lakh population)	2.27	33	5.5	14.5
					Total agricultural extension staff (for lakh hectares GCA)	8.84	11	9.0	21.0
					Crop insurance coverage (% of GCA)	6.57	12	6.9	40.0
					Rural post office (per lakh population)	18.02	14	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Nanded has done well only in six parameters such as number of pumpsets, mobile connectivity, number of wholesale markets, number of soil testing labs, access to banking and number of PACs.
- The district is performing poorly in rest of the parameters, particularly in social and institutional infrastructure.
- Policy thrust should be given for improving parameters like cropping intensity through irrigation facilities, electrified households, tractors registered, road density, storage capacity, soil testing labs, literacy rate, number of schools and teachers, access to drinking water and toilets, number of hospitals and beds, institutional deliveries, bank branches, SHGs and ground level credit outlets.

**Table B-19 Report Card of Nandurbar**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
No. of wholesale market per lakh hectare GCA	0.16	11	0.1	0.4	Cropping Intensity (%)	123.76	21	132.9	185.8
Rural road density (km/sq. km)	0.69	4	0.5	1.2	Rural HH electrification (%)	52.31	33	74.7	99.3
Tractor registered (per '000 hectares GCA)	2.42	13	2.3	8.9	Total storage capacity in MT (per '000 hectares GCA)	0.95	31	6.2	36.6
Per capita power consumption in agriculture (KWh)	293.14	13	255.3	695.6	No. of soil testing labs per lakh hectare GCA	0.05	23	0.1	0.3
Access to mobile (%)	47.84	13	42.9	69.6	No of Pumpset per '000 hectare of GCA	2.36	33	21.3	68.4
					Irrigation Potential Realised (%)	8.50	32	46.2	107.8
					Pumpsets energised (per '000 GCA)	13.54	21	15.6	31.3
<b>Social Infrastructure</b>									
Hospitals (per lakh population)	4.22	4	3.1	5.1	Rural Literacy Rate	50.72	33	67.8	77.6
Percentage of Schools with more than single teacher	98.14	16	97.4	99.2	School density per '000 children	12.40	14	13.7	36.6
					HH with drinking water facilities (%)	30.84	28	40.5	68.1
					HH with toilet (%)	28.70	30	47.7	75.9
					Hospital beds (per '000 persons)	0.57	18	0.7	2.3
					Institutional deliveries (%)	67.10	33	88.9	100.0
<b>Institutional Infrastructure</b>									
SHG (per lakh population)	6.54	11	5.5	14.5	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	7.79	33	23.9	55.1
Rural post office (per lakh population)	30.96	3	19	48.8	No. of Banks (per lakh population)	2.70	33	9.6	25.3
					HH with banking facility (%)	29.35	33	61.5	79.6
					Total agricultural extension staff (per lakh hectare GCA)	7.92	20	9.0	21.0
					Crop insurance coverage (% of GCA)	2.71	19	6.9	40.0
					PACs (per lakh population)	17.21	31	33.6	70.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Nandurbar has done well only in nine parameters namely; road and mobile connectivity, tractors registered, wholesale market, power consumption for agriculture, schools with more than single teacher, hospitals, SHGs and number of post offices.
- The district has performed poorly in rest of the parameters.
- Major thrust is required to improve parameters like cropping intensity through irrigation facilities, electrified households, storage capacity, soil testing lab, literacy rate, number of schools, access to drinking water and toilets, number of beds, institutional deliveries, number of ground level credit outlets, bank branches, PACs, agricultural staff and coverage of crop insurance.

Table B-20 Report Card of Nasik

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
No of Pumpset per '000 hectare of GCA	42.08	3	21.3	68.4	Cropping Intensity (%)	114.65	29	132.9	185.8
Per capita power consumption in agriculture (KWh)	310.95	11	255.3	695.7	Irrigation Potential Realised (%)	34.85	20	46.2	107.8
Rural road density (km/ sq. km)	0.71	3	0.5	1.2	Rural HH electrification (%)	60.70	30	74.7	99.2
Tractor registered (for '000 ha GCA)	8.17	1	2.3	8.2					
Pumpsets energised (per '000 GCA)	31.34	1	15.6	31.3					
Total storage capacity (MT for '000 ha GCA)	4.28	11	6.2	36.6					
Wholesale markets (per lakh ha of GCA)	0.17	10	0.1	0.4					
Access to mobile (%)	50.49	11	42.9	69.3					
No. of soil testing labs per lakh hectare GCA	0.17	5	0.1	0.3					
<b>Social Infrastructure</b>									
Hospitals (per lakh population)	3.02	14	3.1	5.1	Rural Literacy Rate	66.28	20	67.8	77.6
HH with drinking water facilities (%)	41.13	12	40.5	68.1	School density per '000 children	9.09	29	13.7	36.6
					Percentage of Schools with more than single teacher	94.29	31	97.4	99.2
					Hospital beds (per '000 persons)	0.39	27	0.7	2.3
					Institutional deliveries (%)	84.90	23	88.9	100.0
					HH with toilet (%)	46.80	15	47.7	75.9
<b>Institutional Infrastructure</b>									
Total agricultural extension staff (per lakh GCA)	10.50	7	9.0	21.0	HH with banking facility (%)	57.56	22	61.5	79.6
					No. of Banks (per lakh population)	9.40	16	9.6	25.3
					Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	16.41	21	23.9	55.1
					PACs (per lakh population)	29.83	24	33.6	70.5
					SHG (per lakh population)	3.00	27	5.5	14.5
					Rural post office (per lakh population)	17.21	18	19.0	48.7
					Crop insurance coverage (% of GCA)	0.63	31	6.9	40.1

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Nasik has done well mostly in physical infrastructure.
- The district is performing poorly in as many as 15 parameters, mostly in social and institutional infrastructure.
- Policy authorities should focus on improving both social and institutional infrastructure for this district.

**Table B-21 Report Card of Osmanabad**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	185.76	1	132.9	185.8	No of Pumpset per '000 hectare of GCA	13.81	24	21.3	68.4
Per capita power consumption in agriculture (KWh)	563.52	3	255.3	695.7	Irrigation Potential Realised (%)	4.95	33	46.2	107.8
Pumpsets energised (per '000 GCA)	18.64	9	15.6	31.3	Rural HH electrification (%)	64.62	28	74.7	99.2
Access to mobile (%)	46.79	15	42.9	69.3	Rural road density (km/sq. km)	0.43	21	0.5	1.2
					Tractor registered (for '000 ha GCA)	1.49	22	2.3	8.2
					Total storage capacity (MT for '000 ha GCA)	1.62	29	6.2	36.6
					Wholesale markets (per lakh ha of GCA)	0.12	19	0.1	0.4
					No. of soil testing labs per lakh hectare GCA	0.03	28	0.1	0.3
<b>Social Infrastructure</b>									
Percentage of Schools with more than single teacher	98.56	9	97.4	99.2	Rural Literacy Rate	67.27	19	67.8	77.6
					School density per '000 children	11.67	18	13.7	36.6
Institutional deliveries (%)	92.70	13	88.9	100.0	Hospital beds (per '000 persons)	0.36	29	0.7	2.3
					Hospitals (per lakh population)	3.05	12	3.1	5.1
					HH with drinking water facilities (%)	38.04	20	40.5	68.1
					HH with toilet (%)	27.70	31	47.7	75.9
<b>Institutional Infrastructure</b>									
Crop insurance coverage (% of GCA)	8.00	7	6.9	40.1	No. of Banks (per lakh population)	9.00	18	9.6	25.3
HH with banking facility (%)	68.5	8	61.5	79.6	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	18.72	17	23.9	55.1
PACs (per lakh population)	34.14	17	33.6	70.5	SHG (per lakh population)	3.44	23	5.5	14.5
					Rural post office (per lakh population)	14.14	28	19.0	48.8
					Total agricultural extension staff (per lakh GCA)	5.77	29	9.0	21.0

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Osmanabad has done well in nine parameters such as cropping intensity, power consumption for agriculture, mobile connectivity, pumpsets energised, number of schools with more than one teacher, institutional deliveries, households with banking facilities, PACs and coverage of crop insurance.
- The district is performing poorly in rest of the parameters.
- Major emphasis should be given to improve parameters like irrigation facilities, household electrification, road density, storage capacity, number of wholesale markets and soil testing labs, literacy rate, number of schools, hospitals and beds, access to drinking water, toilets, number of banks and post office branches, SHGs and agricultural extension staff.

**Table B-22 Report Card of Parbhani**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	172.46	3	132.9	185.8	Pumpsets per '000 hectare of GCA	15.03	19	21.3	68.4
Per capita power consumption in agriculture (KWh)	377.62	7	255.3	695.7	Irrigation Potential Realised (%)	30.29	22	46.2	107.8
Access to mobile (%)	52.83	8	42.9	69.3	Rural HH electrification (%)	69.43	23	74.7	99.2
					Rural road density (km/sq. km)	0.46	20	0.5	1.2
					Tractor registered (for '000 ha GCA)	0.96	28	2.3	8.2
					Pumpsets energised (per '000 GCA)	11.24	25	15.6	31.3
					Total storage capacity (MT for '000 ha GCA)	2.56	22	6.2	36.6
					Wholesale markets (per lakh ha of GCA)	0.14	15	0.1	0.4
					No. of soil testing labs per lakh hectare GCA	0.06	19	0.1	0.3
<b>Social Infrastructure</b>									
Institutional deliveries (%)	93.8	9	88.9	100.0	Rural Literacy Rate	60.29	30	67.8	77.6
Percentage of Schools with more than single teacher	97.94	19	97.4	99.2	School density per '000 children	9.59	27	13.7	36.6
					Hospital beds (per '000 persons)	0.63	15	0.7	2.3
					Hospitals (per lakh population)	2.45	30	3.1	5.1
					HH with drinking water facilities (%)	33.13	22	40.5	68.1
					HH with toilet (%)	28.80	29	47.7	75.9
<b>Institutional Infrastructure</b>									
Crop insurance coverage (% of GCA)	8.00	7	6.9	40.1	No. of Banks (per lakh population)	9.00	18	9.6	25.3
HH with banking facility (%)	62.59	18	61.5	79.6	Sum of Ground level credit outlets, Agribusiness clinics and FPC (per lakh population)	18.72	17	23.9	55.1
PACs (per lakh population)	35.14	16	33.6	70.5	SHG (per lakh population)	3.44	23	5.5	14.5
					Rural post office (per lakh population)	14.14	28	19.0	48.8
					Total agricultural extension staff (per lakh GCA)	5.77	29	9.0	21.0

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Parbhani has done well only in eight parameters such as cropping intensity, electricity consumption for agricultural purpose, mobile connection, schools with more than single teacher, institutional deliveries, households with banking facility, PACs and coverage of crop insurance.
- The district has performed poorly in rest of the parameters.
- Policy authorities should focus on improvement of all parameters

Table B-23 Report Card of Pune

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Rural HH electrification (%)	79.46	10	74.7	99.3	Cropping Intensity (%)	129.89	17	132.9	185.8
No. of soil testing labs per lakh hectare GCA	4.70	3	0.1	0.3	Per capita power consumption in agriculture (KWh)	230.90	20	255.3	695.6
No of Pumpset per '000 hectare of GCA	30.03	7	21.3	68.4	Total storage capacity in MT (per '000 hectares GCA)	2.18	27	6.2	36.6
Irrigation Potential Realised (%)	99.53	2	46.2	107.8	No. of wholesale market per lakh hectare GCA	0.11	21	0.1	0.4
Pumpsets energised (per '000 GCA)	24.99	5	15.6	31.3					
Tractor registered (per '000 hectares GCA)	4.70	3	2.3	8.9					
Rural road density (km/sq. km)	0.68	5	0.5	1.2					
Access to mobile (%)	129.89	1	42.9	69.6					
<b>Social Infrastructure</b>									
Rural Literacy Rate	71.29	11	67.8	77.6	School density per '000 children	8.13	32	13.7	36.6
HH with drinking water facilities (%)	51.17	6	40.5	68.1	Percentage of Schools with more than single teacher	97.01	25	97.4	99.2
HH with toilet (%)	73.80	4	47.7	75.9	Hospitals (per lakh population)	2.61	24	3.1	5.1
Hospital beds (per '000 persons)	0.81	11	0.7	2.3					
Institutional deliveries (%)	93.30	11	88.9	100.0					
<b>Institutional Infrastructure</b>									
No. of Banks (per lakh population)	12.78	8	9.6	25.3	SHG (per lakh population)	4.55	19	5.5	14.5
HH with baning facility (%)	71.98	5	61.5	79.6	Crop insurance coverage (% of GCA)	4.04	16	6.9	40.1
Total agricultural extension staff (per lakh GCA)	8.94	10	9.0	21.0	Rural post office (per lakh population)	17.10	19	19.0	48.8
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	35.97	6	23.9	55.1					
PACs (per lakh population)	37.22	12	33.6	70.5					

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Pune has done well in 18 parameters except cropping intensity, wholesale market, power consumption for agriculture, storage capacity, school density, number of schools with more than single teacher, hospitals, SHGs, crop insurance coverage and post offices.
- Policy authorities should focus on action plan for improving cropping intensity through irrigation facilities, wholesale market, power consumption for agriculture, storage capacity, school density, hospitals, number of teachers, SHGs, crop insurance coverage and post offices.

**Table B-24 Report Card of Raigad**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Rural HH electrification (%)	87.38	6	74.7	99.3	Cropping Intensity (%)	114.32	30	132.9	185.8
No of Pumpset per '000 hectare of GCA	5.33	32	21.3	68.4	Total storage capacity in MT (per '000 hectares GCA)	4.13	12	6.2	36.6
Irrigation Potential Realised (%)	10.64	30	46.2	107.8	Per capita power consumption in agriculture (KWh)	14.22	31	255.3	695.6
No. of wholesale market per lakh hectare GCA	0.42	1	0.1	0.4	Pumpsets energised (per '000 GCA)	7.96	29	15.6	31.3
No. of soil testing labs per lakh hectare GCA	0.09	9	0.1	0.3	Tractor registered (per '000 hectares GCA)	0.77	30	2.3	8.9
					Rural road density (km/sq. km)	0.35	25	0.5	1.2
					Access to mobile (%)	36.31	22	42.9	69.6
<b>Social Infrastructure</b>									
Rural Literacy Rate	69.89	16	67.8	77.6	Percentage of Schools with more than single teacher	91.25	33	97.4	99.2
School density Per '000 children	19.48	4	13.7	36.6	HH with drinking water facilities(%)	40.25	14	40.5	68.1
HH with toilet (%)	62.00	9	47.7	75.9	Institutional deliveries (%)	54.83	26	88.9	100.0
Hospitals (per lakh population)	3.31	9	3.1	5.1					
Hospital beds (per '000 persons)	0.83	10	0.7	2.3					
<b>Institutional Infrastructure</b>									
No. of Banks (per lakh population)	13.64	7	9.6	25.3	HH with banking facility (%)	54.83	26	61.5	79.6
Total agricultural extension staff (per lakh GCA)	18.93	2	9.0	21.0	SHG (per lakh population)	5.42	14	5.5	14.5
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	27.64	11	23.9	55.1	Crop insurance coverage (% of GCA)	0.84	27	6.9	40.1
Rural post office (per lakh population)	19.95	7	19.0	48.8	PACs (per lakh population)	7.81	33	33.6	70.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Raigad has done well only in 11 parameters namely; electrified households, soil testing labs, wholesale market, school density, access to toilet facilities, hospitals, beds, number of bank branches, agricultural extension staff, ground level credit outlets and post offices.
- The district has performed poorly in rest of the parameters.
- Major thrust is required to improve cropping intensity through irrigation facilities, wholesale markets, power consumption for agriculture, storage capacity, access to road and mobile connectivity, number of teachers, access to drinking water and banking facilities, SHGs, PACs and crop insurance coverage.

Table B-25 Report Card of Ratnagiri

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Rural HH electrification (%)	92.39	4	74.7	99.3	Cropping Intensity (%)	103.43	32	132.9	185.8
No. of soil testing labs per lakh hectare GCA	0.19	3	0.1	0.3	Wholesale market per lakh hectare GCA	0.04	33	0.1	0.4
Rural road density (km/sq. km)	0.64	7	0.5	1.2	Total storage capacity in MT (per '000 hectares GCA)	0.15	33	6.2	36.6
					Access to mobile (%)	30.66	29	42.9	69.6
					Pumpsets energised (per '000 GCA)	6.48	32	15.6	31.3
					Per capita power consumption in agriculture (KWh)	6.82	32	255.3	695.6
					No of Pumpset per '000 hectare of GCA	10.92	29	21.3	68.4
					Irrigation Potential Realised (%)	11.44	29	46.2	107.8
					Tractor registered (per '000 hectares GCA)	0.26	33	2.3	8.9
<b>Social Infrastructure</b>									
Rural Literacy Rate	72.47	9	67.8	77.6	Percentage of Schools with more than single teacher	94.74	30	97.4	99.2
School density per '000 children	30.83	2	13.7	36.6	HH with drinking water facilities (%)	39.81	16	40.5	68.1
Hospitals (per lakh population)	4.96	2	3.1	5.1					
Hospital beds (per '000 persons)	0.92	8	0.7	2.3					
HH with toilet (%)	69.40	6	47.7	75.9					
Institutional deliveries (%)	95.30	6	88.9	100.0					
<b>Institutional Infrastructure</b>									
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	48.45	2	23.9	55.0	HH with banking facility (%)	54.67	27	61.5	79.6
SHG (per lakh population)	7.15	7	5.5	14.5	Crop insurance coverage (% of GCA)	0.87	25	6.9	40.1
Total agricultural extension staff (per lakh GCA)	16.08	3	9	21.0	PACs (per lakh population)	27.16	29	33.6	70.5
No. of Banks (per lakh population)	14.87	4	9.6	25.3					
Rural post office (per lakh population)	48.10	2	19	48.8					

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Ratnagiri has done well in 13 parameters such as electrified households, soil testing labs, road connectivity, literacy rate, school density, hospitals, beds, access to toilets, institutional deliveries, number of ground level credit outlets, SHGscapita, bank branches, number of post offices and agricultural extension staff.
- The district has performed poorly in rest of the parameters.
- Policy authorities should focus on action plan for improving cropping intensity through irrigation facilities, power consumption for agricultural purpose, pumpsets energised, number of pumpsets, number of tractors registered, mobile connectivity, access to drinking water, number of wholesale markets, PACs, and crop insurance coverage.



**Table B-26 Report Card of Sangli**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Rural HH electrification (%)	76.75	13	74.7	99.3	Cropping Intensity (%)	129.49	18	132.9	185.8
No. of soil testing labs per lakh hectare GCA	0.14	8	0.1	0.3	No. of wholesale market per lakh hectare GCA	0.09	28	0.1	0.4
No of Pumpset per '000 hectare of GCA	30.54	6	21.3	68.4	Total storage capacity in MT (per '000 hectares GCA)	2.50	23	6.2	36.6
Irrigation Potential Realised (%)	69.85	9	46.2	107.8					
Per capita power consumption in agriculture (KWh)	375.82	8	255.3	695.6					
Pumpsets energised (per '000 GCA)	27.75	3	15.6	31.3					
Tractor registered (per '000 hectares GCA)	3.35	7	2.3	8.9					
Rural road density (km/sq. km)	1.17	1	0.5	1.2					
Access to mobile (%)	52.34	9	42.9	69.6					
<b>Social Infrastructure</b>									
Hospital beds (per '000 persons)	1.27	5	0.7	2.3	School density per '000 children	13.06	13	13.7	36.6
Rural Literacy Rate	71.10	13	67.8	77.6	Hospitals (per lakh population)	2.81	17	3.1	5.1
HH with drinking water facilities (%)	58.37	3	40.5	68.1	Percentage of Schools with more than single teacher	96.17	29	97.4	99.2
HH with toilet (%)	64.90	8	47.7	75.9					
Institutional deliveries (%)	91.80	14	88.9	100.0					
<b>Institutional Infrastructure</b>									
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	43.70	3	23.9	55.1	SHG (per lakh population)	5.41	15	5.5	14.5
PACs (per lakh population)	36.38	13	33.6	70.5	Total agricultural extension staff (per lakh GCA)	7.29	24	9.0	21.0
No. of Banks (per lakh population)	14.55	5	9.6	25.3	Crop insurance coverage (% of GCA)	0.76	28	6.9	40.1
HH with banking facility (%)	79.62	1	61.5	79.6	Rural post office (per lakh population)	18.59	13	19	48.8

Notes: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, colored in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and colored in light-orange).

- Sangli has done well in 18 parameters except cropping intensity, wholesale market, storage capacity, school density, number of schools with more than single teacher, hospitals, SHGs, agricultural extension staff, crop insurance coverage and post offices.
- Action plan is required for improving cropping intensity, wholesale market, storage capacity, school density, number of teachers, number of hospitals, SHGs, number of agricultural extension staff, crop insurance coverage and number of post offices.

**Table B-27 Report Card of Satara**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Wholesale market per lakh hectare GCA	0.15	14	0.1	0.4	Per capita power consumption in agriculture (KWh)	254.38	18	255.3	695.6
No. of soil testing labs per lakh hectare GCA	0.15	7	0.1	0.3	Cropping Intensity (%)	123.34	22	132.9	185.8
Rural HH electrification (%)	84.59	7	74.7	99.3					
No of Pumpset per '000 hectare of GCA	68.35	1	21.3	68.4					
Total storage capacity in MT (per '000 hectares GCA)	7.66	7	6.2	36.6					
Irrigation Potential Realised (%)	107.83	1	46.2	107.8					
Tractor registered (per '000 hectares GCA)	4.37	4	2.3	8.9					
Rural road density (km/sq. km)	0.59	11	0.5	1.2					
Access to mobile (%)	58.01	3	42.9	69.6					
Pumpsets energised (per '000 GCA)	25.30	4	15.6	31.3					
<b>Social Infrastructure</b>									
Percentage of Schools with more than single teacher	99.00	4	97.4	99.2	Hospitals (per lakh population)	2.92	15	3.1	5.1
Rural Literacy Rate	72.76	7	67.8	77.6					
School density per '000 children	17.84	5	13.7	36.6					
HH with toilet (%)	71.10	5	47.7	75.9					
HH with drinking water facilities(%)	59.80	2	40.5	68.1					
Hospital beds (per '000 persons)	1.79	2	0.7	2.3					
Institutional deliveries (%)	96.70	3	88.9	100.0					
<b>Institutional Infrastructure</b>									
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	48.45	2	23.9	55.1					
HH with banking facility (%)	78.08	2	61.5	79.6					
No. of Banks (per lakh population)	15.37	3	9.6	25.3					
SHG (per lakh population)	7.07	8	5.5	14.5					
Total agricultural extension staff (per lakh GCA)	12.59	5	9.0	21.0					
Crop insurance coverage (% of GCA)	10.38	6	6.9	40.1					
PACs (per lakh population)	39.29	7	33.6	70.5					
Rural post office (per lakh population)	25.93	4	19.0	48.8					

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Satara has done well in 25 parameters except cropping intensity, power consumption for agricultural purpose and hospitals.
- Policy authorities should focus on improving cropping intensity, power consumption for agricultural purpose and hospitals

**Table B-28 Report Card of Sindhudurg**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Rural HH electrification (%)	92.90	3	74.7	99.3	Cropping Intensity (%)	113.31	31	132.9	185.8
Total storage capacity in MT (per '000 hectares GCA)	21.59	3	6.2	36.6	No. of wholesale market per lakh hectare GCA	0.06	32	0.1	0.4
No. of soil testing labs per lakh hectare GCA	0.25	1	0.1	0.3	Irrigation Potential Realised (%)	16.96	27	46.2	107.8
No of Pumpset per '000 hectare of GCA	35.28	4	21.3	68.4	Per capita power consumption in agriculture (KWh)	17.24	30	255.3	695.6
Rural road density (km/sq. km)	1.01	2	0.5	1.2	Pumpsets energised (per '000 GCA)	14.10	18	15.6	31.3
Access to mobile (%)	43.66	17	42.9	69.6	Tractor registered (per '000 hectares GCA)	0.33	32	2.3	8.9
<b>Social Infrastructure</b>									
School density per '000 children	36.58	1	13.7	36.6	Percentage of Schools with more than single teacher	96.97	26	97.4	99.2
Rural Literacy Rate	77.60	1	67.8	77.6					
HH with drinking water facilities (%)	50.61	7	40.5	68.1					
Hospital beds (per '000 persons)	1.30	4	0.7	2.3					
Hospitals (per lakh population)	5.12	1	3.1	5.1					
HH with toilet (%)	75.90	1	47.7	75.9					
Institutional deliveries (%)	100.00	1	88.9	100.0					
<b>Institutional Infrastructure</b>									
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	55.07	1	23.9	55.1	PACs (per lakh population)	30.57	21	33.6	70.5
Rural post office (per lakh population)	48.74	1	19.0	48.8	HH with banking facility (%)	60.45	21	61.5	79.6
Total agricultural extension staff (per lakh GCA)	20.98	1	9.0	21.0	Crop insurance coverage (% of GCA)	0.08	33	6.9	40.1
SHG (per lakh population)	8.64	4	5.5	14.5					
No. of Banks (per lakh population)	25.31	1	9.6	25.3					

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Sindhudurg has done well in 18 parameters except cropping intensity, pumpsets energised, power consumption for agriculture, irrigation potential realised, wholesale market, storage capacity, school density, number of schools with more than single teacher, hospitals, SHGs, agricultural extension staff, crop insurance coverage and post offices.
- Policy authorities should focus on action plan for improving cropping intensity, pumpsets energised, power consumption for agriculture, irrigation potential realised, wholesale market, storage capacity, school density, number of schools with more than single teacher, hospitals, SHGs, agricultural extension staff, crop insurance coverage and post offices.

**Table B-29 Report Card of Solapur**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Per capita power consumption in agriculture (KWh)	695.72	1	255.3	695.6	Rural HH electrification (%)	57.27	31	74.7	99.3
Total storage capacity in MT (per '000 hectares GCA)	15.23	4	6.2	36.6	Cropping Intensity (%)	115.50	28	132.9	185.8
No of Pumpset per '000 hectare of GCA	29.97	8	21.3	68.4	No. of wholesale market per lakh hectare GCA	0.09	26	0.1	0.4
Tractor registered (per '000 hectares GCA)	2.78	9	2.3	8.9	No. of soil testing labs per lakh hectare GCA	0.08	13	0.1	0.3
Irrigation Potential Realised (%)	90.02	4	46.2	107.8					
Rural road density (km/sq. km)	0.66	6	0.5	1.2					
Access to mobile (%)	56.92	4	42.9	69.6					
Pumpsets energised (per '000 GCA)	29.83	2	15.6	31.3					
<b>Social Infrastructure</b>									
Percentage of Schools with more than single teacher	98.16	14	97.4	99.2	Rural Literacy Rate	64.51	24	67.8	77.6
HH with drinking water facilities (%)	40.96	13	40.5	68.1	HH with toilet (%)	41.30	19	47.7	75.9
					School density per '000 children	12.29	15	13.7	36.6
					Hospitals (per lakh population)	2.64	23	3.1	5.1
					Hospital beds (per '000 persons)	0.38	28	0.7	2.3
					Institutional deliveries (%)	87.30	20	88.9	100.0
<b>Institutional Infrastructure</b>									
Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	48.45	2	23.9	55.1	SHG (per lakh population)	4.93	18	5.5	14.5
HH with banking facility (%)	71.22	6	61.5	79.6	Total agricultural extension staff (per lakh GCA)	8.76	13	9.0	21.0
PACs (per lakh population)	43.86	2	33.6	70.5	Crop insurance coverage (% of GCA)	0.67	30	6.9	40.1
No. of Banks (per lakh population)	11.34	11	9.6	25.3	Rural post office (per lakh population)	16.65	20	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Solapur has done well in 14 parameters such as power consumption for agricultural purpose, pumpsets energised, number of pumpsets, tractors registered, road and mobile connectivity, storage capacity, number of schools with more than single teacher, access to drinking water, number of ground level credit outlets, access to banking facilities, number of bank branches and PACs.
- The district has performed poorly in rest of the parameters.
- Policy authorities should focus on action plan for improving cropping intensity through irrigation facilities, household electrification, number of wholesale markets, number of soil testing labs, literacy rate, access to toilets, number of schools, hospitals and beds, institutional deliveries, SHGs, agricultural extension staff, crop insurance coverage and number of post offices.

Table B-30 Report Card of Thane

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Rural HH electrification (%)	96.00	2	74.7	99.3	Cropping Intensity (%)	102.3	33	132.9	185.8
No. of wholesale market per lakh hectare GCA	0.25	3	0.1	0.4	Total storage capacity in MT (per '000 hectares GCA)	3.10	19	6.2	36.6
No. of soil testing labs per lakh hectare GCA	0.21	2	0.1	0.3	No of Pumpset per '000 hectare of GCA	11.12	30	21.3	68.4
					Irrigation Potential Realised (%)	19.27	24	46.2	107.8
					Per capita power consumption in agriculture (KWh)	5.53	33	255.3	695.6
					Pumpsets energised (per '000 GCA)	2.27	33	15.6	31.3
					Tractor registered (per '000 hectares GCA)	1.02	27	2.3	8.9
					Rural road density (km/sq. km)	0.47	17	0.5	1.2
					Access to mobile (%)	36.84	20	42.9	69.6
<b>Social Infrastructure</b>									
HH with toilet (%)	67.00	7	47.7	75.9	% of schools with more than single teacher	91.75	32	97.4	99.2
Hospitals (per lakh population)	3.10	10	3.1	5.1	Rural Literacy Rate	60.50	29	67.8	77.6
Institutional deliveries (%)	93.10	12	88.9	100.0	School density (per '000 children)	2.74	33	13.7	36.6
					HH with drinking water facilities (%)	36.31	21	40.5	68.1
					Hospital beds (per '000 persons)	0.48	21	0.7	2.3
<b>Institutional Infrastructure</b>									
Agricultural extension staff (per lakh GCA)	9.01	9	9.0	21.0	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	9.07	32	23.9	55.0
					No. of Banks (per lakh population)	4.90	30	9.6	25.3
					HH with banking facility (%)	54.41	28	61.5	79.6
					SHG (per lakh population)	2.98	29	5.5	14.5
					Crop insurance coverage (% of GCA)	0.67	29	6.9	40
					PACs (per lakh population)	16.11	32	33.6	70.5

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Thane has done well in seven parameters such as electrified households, wholesale markets and soil testing labs, hospitals, toilets, institutional deliveries, and extension staff.
- The district has performed poorly in rest of the parameters.
- Policy authorities should focus on inclusive improvement of all parameters. However, major thrust should be given to cropping intensity through irrigation facilities, road and mobile connectivity, storage capacity, literacy rate, number of schools and teachers, drinking water facilities number of beds, banks, SHGs, PACs, ground level credit outlets, crop insurance coverage and post offices.

**Table B-31 Report Card of Wardha**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Rural HH electrification (%)	83.98	8	74.7	99.3	Cropping Intensity (%)	127.27	19	132.9	185.8
No. of wholesale market per lakh hectare GCA	0.15	13	0.1	0.4	Total storage capacity in MT (per '000 hectares GCA)	2.42	25	6.2	36.6
Irrigation Potential Realised (%)	51.43	14	46.2	107.8	No. of soil testing labs per lakh hectare GCA	0.09	11	0.1	0.3
					No of Pumpset per '000 hectare of GCA	18.57	14	21.3	68.4
					Per capita power consumption in agriculture (KWh)	134.91	25	255.3	695.6
					Pumpsets energised (per '000 GCA)	14.83	16	15.6	31.3
					Tractor registered (per '000 hectares GCA)	1.51	21	2.3	8.9
					Rural road density (km/sq. km)	0.58	28	0.5	31.3
					Access to mobile (%)	39.22	19	42.9	69.6
<b>Social Infrastructure</b>									
Rural Literacy Rate	75.80	3	67.8	77.6					
School density per '000 children	16.00	7	13.7	36.6					
% of schools with more than single teacher	97.5	22	97.4	99.2					
HH with drinking water facilities (%)	49.13	8	40.5	68.1					
HH with toilet (%)	56.70	11	47.7	75.9					
Hospitals (per lakh population)	3.08	11	3.1	5.1					
Hospital beds (per '000 persons)	1.56	3	0.7	2.3					
Institutional deliveries (%)	66.47	13	88.9	100.0					
<b>Institutional Infrastructure</b>									
HH with banking facility (%)	66.47	13	61.5	79.6	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	19.87	15	23.9	55.1
SHG (per lakh population)	14.51	1	5.5	14.5	No. of Banks (per lakh population)	7.41	23	9.6	25.3
Crop insurance coverage (% of GCA)	40.09	1	6.9	40.1	Total agricultural extension staff (per lakh GCA)	8.35	15	9.0	21.0
PACs (per lakh population)	38.98	8	33.6	70.5	Rural post office (per lakh population)	18.92	12	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Wardha has done well in 15 parameters mostly in social infrastructure.
- The district has performed poorly in 13 other parameters such as cropping intensity, pumpsets energised, road and mobile connectivity, storage capacity, tractors registered, number of pumpsets, bank branches, agricultural extension staff, post offices and ground level credit outlets.
- Policy authorities should focus on improving the aforementioned 13 parameters.

**Table B-32 Report Card of Washim**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
Cropping Intensity (%)	139.82	8	132.9	185.8	Rural HH electrification (%)	73.46	16	74.7	99.3
Irrigation Potential Realised (%)	54.77	13	46.2	107.8	No. of wholesale market per lakh hectare GCA	0.11	20	0.1	0.4
Per capita power consumption in agriculture (KWh)	256.85	16	255.3	695.6	Total storage capacity in MT (per '000 hectares GCA)	5.37	9	6.2	36.6
					No. of soil testing labs per lakh hectare GCA	0.06	21	0.1	0.3
					No of Pumpset per '000 hectare of GCA	13.06	26	21.3	68.4
					Pumpsets energised (per '000 GCA)	10.29	27	15.6	31.3
					Tractor registered (per '000 hectares GCA)	1.80	18	2.3	8.9
					Rural road density (km/sq. km)	0.19	30	0.5	1.2
					Access to mobile (%)	40.79	18	42.9	69.6
<b>Social Infrastructure</b>									
Rural Literacy Rate	71.70	10	67.8	77.6	School density per '000 children	12.05	16	13.7	36.6
% of schools with more than single teacher	98.9	5	97.4	99.2	HH with drinking water facilities(%)	31.76	26	40.5	68.1
					HH with toilet (%)	33.80	24	47.7	75.9
					Hospitals (per lakh population)	2.54	27	3.1	5.1
					Hospital beds (per '000 persons)	0.33	32	0.7	2.3
					Institutional deliveries (%)	83.00	27	88.9	100.0
<b>Institutional Infrastructure</b>									
Crop insurance coverage (% of GCA)	7.12	11	6.9	40.1	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	13.29	28	23.9	55.1
PACs (per lakh population)	43.01	3	33.6	70.5	No. of Banks (per lakh population)	3.24	31	9.6	25.3
HH with banking facility (%)	63.31	16	61.5	79.6	Total agricultural extension staff (per lakh GCA)	7.58	21	9.0	21.0
					SHG (per lakh population)	3.51	22	5.5	14.5
					Rural post office (per lakh population)	16.43	22	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Washim has done well only in eight parameters namely cropping intensity, irrigation potential realised, power consumption for agriculture, households with banking facility, literacy rate, number of schools with more than single teacher, PACs, and coverage of crop insurance.
- The district has performed poorly in rest of the parameters.
- Parameters such as household electrification, road and mobile connectivity, number of wholesale markets, storage capacity, availability of pumpsets, power consumption for agriculture, soil testing labs, number of schools, access to drinking water and toilets, number of hospitals and beds, institutional deliveries, number of bank branches and post offices, availability of extension staff and ground level credit outlets should be given major focus.

**Table B-33 Report Card of Yavatmal**

Performing well on parameters	Value	Rank	State Average	Top District Score	Performing poorly on parameters	Value	Rank	State Average	Top District Score
<b>Physical Infrastructure</b>									
No. of wholesale market per lakh hectare GCA	0.17	9	0.1	0.4	Cropping Intensity (%)	116.13	27	132.9	185.8
Per capita power consumption in agriculture (KWh)	263.06	15	255.3	695.7	Rural HH electrification (%)	64.07	29	74.7	99.3
					Total storage capacity in MT (per '000 hectares GCA)	2.44	24	6.2	36.6
					No. of soil testing labs per lakh hectare GCA	0.02	33	0.1	0.3
					No of Pumpset per '000 hectare of GCA	14.01	22	21.3	68.4
					Irrigation Potential Realised (%)	39.79	17	46.2	107.83
					Pumpsets energised (per '000 GCA)	11.24	24	15.6	31.3
					Tractor registered (per '000 hectares GCA)	0.92	29	2.3	8.2
					Rural road density (km/sq. km)	0.21	29	0.5	1.2
					Access to mobile (%)	33.27	26	42.9	69.3
<b>Social Infrastructure</b>									
Rural Literacy Rate	70.65	14	67.8	77.6	School density per '000 children	8.54	11	13.7	36.6
Percentage of Schools with more than single teacher	97.89	20	97.4	99.2	HH with drinking water facilities(%)	27.83	30	40.5	68.1
					HH with toilet (%)	31.00	28	47.7	75.9
					Hospitals (per lakh population)	2.90	16	3.1	5.1
					Hospital beds (per '000 persons)	0.34	30	0.7	2.3
					Institutional deliveries (%)	84.20	24	88.9	100.0
<b>Institutional Infrastructure</b>									
SHG (per lakh population)	6.89	9	5.5	14.2	Sum of Ground level credit outlets, Agribusiness clinics & FPC (per lakh population)	14.30	26	23.9	55.1
					No. of Banks (per lakh population)	6.76	25	9.6	25.3
					HH with banking facility (%)	56.71	24	61.5	79.6
					Total agricultural extension staff (per lakh GCA)	7.39	23	9.0	21.0
					Crop insurance coverage (% of GCA)	2.70	20	6.9	40.1
					PACs (per lakh population)	27.37	28	33.6	70.5
					Rural post office (per lakh population)	16.05	23	19.0	48.8

Note: Parameters are categories into two groups: (1) districts performing well on parameters (presented on the left side of report card, coloured in light-green) (2) districts performing poorly on parameters (presented on the right side of report card and coloured in light-orange).

- Yavatmal has done well only in five parameters namely wholesale market, rural literacy, power consumption for agriculture, number of schools with more than single teacher and SHGs.
- The district has performed poorly in rest of the parameters.
- Policy authorities should focus on comprehensive round improvement of all parameters.



## Appendix C: Village Level Questionnaire

My name is \_\_\_\_\_. I am the faculty at Symbiosis School of Economics (SSE), Pune. We are doing a study on 'Rural Development Infrastructure Index for Maharashtra' sanctioned by NABARD. We would like to record the village-level data about the demographic, agricultural land-use, and different infrastructural parameters. The data collected from yourself will be totally confidential and will be used exclusively for research purpose. We do not have any links with any company or government. Your cooperation will be very useful for the study.

Village	
Gram Panchayat Name	
Taluka	
District	
Name of the Respondent	
Official Position of the Respondent	
Contact No.	
Nearest Town Name	
Nearest Town Distance from Village (in Km.)	
Population of Village	
Population density (persons per sq. km.)	
No. of households	
Sex Ratio (females per 1000 males)	
SC Population %	
ST Population %	
Tribal Population %	
Literacy Rate % (Total)	
Female Literacy Rate	
Male Literacy Rate	
<b>Geographical Information and Land Utilization</b>	
Rivers	
Tributaries	
Types of Soils	
Total Geographical Area	
Area Under Forest	
Barren and Unculturable Land	
Cultural Waste Land	
Area under Non-agricultural Use	
Permanent Pasture & other Grazing Land	
Other Uncultivated Land Excluding Fallow	
Current Fallow Lands	
Net Area Sown	
Gross Cropped Area	
Crops Grown	

## Irrigation Infrastructure

Particular	Availability within village (1. Yes; 2. No)	If Yes, Numbers.	Functioning all-around the year (number)	Area Irrigated
Sources of irrigation				
Open Well				
Tube Wells				
Ponds				
Canal irrigation				
Lift Irrigation				
Tanks				

## Electricity

Particulars	Units
Percentage of pumpsets energized	
Power Supply For Agriculture use Summer (April-Sept.) per day (in Hours)	
Power Supply For Agriculture Use Winter (Oct.-March) per day (in Hours)	
Power Supply For All Users Summer (April-Sept.) per day (in Hours)	
Power Supply For All Users Winter (Oct.-March) per day (in Hours)	

## Street Lighting

Street lighting	1. Yes; _____ 2. No
Source of Street Lighting	1. Electric; 2. Solar

## Availability and Distance of Physical Infrastructure

Particular	Availability within village (1. Yes; 2. No)	If Yes, Numbers.	if No, Distance to the nearest
Post Office			
Wholesale Agriculture Market			
Village Market			
Godown for farm produce			
Milk Collection Centre			
Milk Chilling Centre			
Cold storage			
Soil testing Lab			
Fertilizer shop			
IT Kiosk (e-Choupal)			
Tractors			
Extension services			

**Availability and Distance of Transport Infrastructure**

Particular	Units (kms)
Total Road length within village	
Surfaced Road length	
Unsurfaced Road length.	
Distance of village from State Highway/National Highway	
Kind of Road connecting Village 1. Standard Single Lane	
	2. Standard Double lane;
	3. Standard Multi Lane.
Distance of Village to Nearest Railway Station	

**Public Transport Infrastructure Access and Availability**

Particulars	1. Yes; 2. No	Units
Does MSRTC bus pass through the village		
Frequency of MSRTC bus in a day		
Access to Maxi Cab/Modified Autos services		
Access to Private Bus services		

**Amenities**

% of Household with Pucca house	
% of Households having Electricity Connection	
% of Households with toilet facility within house	
% of Households with drinking water tap within house	
No. handpumps functioning all-round the year	
Number of Community Toilets	
Who manages the Community toilets?	

**Drainage system**

Particulars	1. Yes; 2. No
Village having Close drainage facility	1. Yes; 2. No
Village having Open drainage facility	1. Yes; 2. No
How is Drain water discharged?	1. Water Bodies 2. Sewer Plants

### Availability and Distance of Social Infrastructure

Particular	Availability within village (1. Yes; 2. No)	If Yes, Number	if No, then nearest facility distance (Km)	Common Mode to access the nearest facility
Hospital				
Dispensaries				
Primary Health Centers				
Primary Health Sub-Centers				
Community Health Centres				
Veterinary Hospitals				
Medical Shop				
Diagnostic centre				
Anganwadi Kendras				
Total Primary schools				
Primary schools (Co-ed)				
Primary schools (girls only)				
Total Secondary schools				
Secondary schools (Co-ed)				
Secondary schools (Girls only)				
Private Secondary School				
Higher Secondary Schools				
ITI government				
ITI Private				
Degree colleges				
Public Library				
Public Reading Room				
Asha Workers				
Youth Group				

### Availability and Distance of Institutional Infrastructure

Particular	Availability within village (1. Yes; 2. No)	If Yes, Number	if No, then nearest facility distance (Km)
Credit Cooperative Society			
Commercial Bank			
ATM for cash withdrawal			
Dairy Cooperative			
Marketing Cooperative			
Self-help-Groups			
Joint-liability Groups			
Agribusiness Clinic			
Fair Price Shop			

Q. What are the infrastructure problems faced by rural areas?

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Q. What are the Government Schemes being implemented for rural infrastructure?

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## Schedule for School and Hospitals/dispensaries

### Quality of Infrastructure at Schools

Particular	No. of Students	No. of teachers	Separate Toilets for Girls (Numbers)	Total Classrooms (Numbers)
Primary Schools				
1. _____				
2.				
3.				
Secondary Schools				
1.				
2.				
3.				

Q. Is there the boundary wall for the schools?

1. Yes.      2. No.

### Quality of Infrastructure at Health Centres

Particular (within Village or about the nearest facility)	Numbers	Doctors Total Strength (Numbers)	Para Medical Staff Total Strength (Numbers)	Availability of Doctor 24 Hours yes /No
Dispensaries				
Primary Health Centre				
Community Health Centre				
Maternity And Child Welfare Centre				
Hospital Allopathic (Numbers)				



## Bibliography

- Acemoglu, D., Johnson, S., & Robinson, J. A. (2005). *Institutions as a fundamental cause of long-run growth*. *Handbook of Economic Growth*, 1, 385-472.
- Agriculture Census Division. (2016). *All India report on input survey 2011-12*. Department of Agriculture, Cooperation & Farmers Welfare, Ministry of Agriculture & Farmers Welfare, New Delhi.
- Ahmed, R., & Hossain, M. (1990). *Development impact of rural infrastructure in Bangladesh*. International Food Policy Research Institute.
- Ahmed, R., & C. Donovan (1992). *Issues of infrastructural development: A synthesis of the literature*. Washington, D.C.: International Food Policy Research Institute.
- Ali, I., & Pernia, E. M. (2003). *Infrastructure and poverty reduction-what is the connection?* Asian Development Bank Economics and Research Department Policy Brief no. 13. retrieved from <https://think-asia.org/bitstream/handle/11540/613/pb013.pdf?sequence=1>
- Antle, J. M. (1983). Infrastructure and agricultural productivity: Theory, evidence and implication for growth and equity in agricultural development. *Growth and Equity in Agricultural Development* (pp. 181-193). Proceedings Eighteenth International Conference of Agricultural Economists.
- Apte, P., Bodkhe, N., & Dhume, A. (2014). Regional growth strategies for the rest of Maharashtra. *Artha Vijnana*, LVI(2), 278-293.
- Aschauer, D. A. (1989). Is public expenditure productive? *Journal of Monetary Economics*, 23, 177-200.
- Bakshi, S., Chawla, A., & Shah, M. (2015). Regional disparities in India: A moving frontier. *Economic and Political Weekly*, 50(1), 44-52.
- Barnes, D. F., & Binswanger, H. P. (1986). Impact of rural electrification and infrastructure on agricultural changes. *Economic and Political Weekly*, 21(1), 26-34.
- Bhatia, M. S. (1999). Rural infrastructure and growth in agriculture. *Economic and Political Weekly*, 34(2), A43-A48.
- Binswanger, H. P., Khandker, S. R., & Rosenzweig, M. R. (1993). How infrastructure and financial institutions affect agricultural output and investment in India. *Journal of Development Economics*, 41(2), 337-366.
- Binswanger, H., Yang, M., Bowers, A., & Mudlak, Y. (1987). On the determinants of cross country aggregate agricultural supply. *Journal of Econometrics*, 36(1), 111-131.

- Bottini, N., Coelho, M., & Kao, J. (2012). *Infrastructure and growth*. Preliminary version. London School of Economics Growth Commission Report.
- Calderón, C., & Chong, A. (2004). Volume and quality of infrastructure and the distribution of income: an empirical investigation. *Review of Income and Wealth*, 50(1), 87-106.
- Canning, D. (1998). A database of world stocks of infrastructure, 1950-95. *World Bank Economic Review*, 12(3), 529-547.
- Chan, C., Forwood, D., Roper, H., & Sayers, C. (2009). *Public infrastructure financing: An international perspective*, Productivity Commission Staff Working Paper.
- Chand, R., Srivastava, S., & Singh, J. (2017). *Changing structure of rural economy of India implications for employment and growth*. New Delhi: NITI Aayog. Retrieved from [http://niti.gov.in/writereaddata/files/document\\_publication/Rural\\_Economy\\_DP\\_final.pdf](http://niti.gov.in/writereaddata/files/document_publication/Rural_Economy_DP_final.pdf)
- Census of India 2011. (2014a). *District census handbook Beed: Village and town directory*. Directorate of Census Operations Maharashtra.
- Census of India 2011. (2014b). *District census handbook Satara: Village and town directory*. Directorate of Census Operations Maharashtra.
- Comprehensive District Agricultural Plan (C-DAP) 2012-13 to 2016-17 Beed District. Government of Maharashtra. Retrieved from [http://krishi.maharashtra.gov.in/Site/Upload/Pdf/beed\\_cdap.pdf](http://krishi.maharashtra.gov.in/Site/Upload/Pdf/beed_cdap.pdf)
- Comprehensive District Agricultural Plan (C-DAP) 2012-13 to 2016-17 Satara District. Government of Maharashtra. Retrieved from [http://krishi.maharashtra.gov.in/Site/Upload/Pdf/satara\\_cdap.pdf](http://krishi.maharashtra.gov.in/Site/Upload/Pdf/satara_cdap.pdf)
- Comptroller and Auditor General of India. (2017). *Report of Comptroller and Auditor General of India on State Finances for the year ended 31 March 2016*. Government of Maharashtra Report No. 6 of the year 2016. Retrieved from [https://cag.gov.in/sites/default/files/audit\\_report\\_files/Maharashtra\\_Report\\_No\\_6\\_of\\_2016\\_on\\_State\\_Finances.pdf](https://cag.gov.in/sites/default/files/audit_report_files/Maharashtra_Report_No_6_of_2016_on_State_Finances.pdf)
- Debroy, B., & Bhandari, L. (2003). *District level deprivation in the new millennium*. RGICS and Indicus Analytics.
- de Vries, E. (1960). Finance for development. in 'Proceedings of the International Conference of Agricultural Economists'. London: Oxford University Press.
- Dhawan, B. D. (1988). *Irrigation in India's agricultural development: Productivity, stability, equity*. New Delhi: Sage Publications.
- ESCAP. (2000). *Evaluation of infrastructural interventions for rural poverty alleviation*. The United Nations Economic and Social Commission for Asia and the Pacific, Bangkok, Thailand.



- Evenson, R. (1986). Infrastructure, output supply and input demand in philippine agriculture: provisional estimates. *Journal of Philippine Development*, 13(23), 62-76.
- Fan, S., Hazell, P., & Thorat, S. (2000). Government spending, growth and poverty in rural India. *American Journal of Agricultural Economics*, 82(4), 1038-1051.
- Ghosh, B., & De, P. (1998). Role of infrastructure in regional development: a study over the plan period. *Economic and Political Weekly*, 33(47/48), 3039-3048.
- Government of India. (2012). *Manual infrastructure statistics*. New Delhi: Central Statistics Office, Ministry of Statistics and Programme Implementation, Government of India.
- Government of India. (2016). *State of Indian agriculture 2015-16*. New Delhi: Ministry of Agriculture & Farmers Welfare, Department of Agriculture, Cooperation & Farmers Welfare, Directorate of Economics & Statistics.
- Government of Maharashtra [GoM] (1984). *Report of the fact finding committee on regional imbalance in Maharashtra*. Published by Government of Maharashtra, Planning Department, Bombay.
- GoM. (2010). *Agro industrial policy 2010-draft for comments and suggestions*. Government of Maharashtra.
- GoM. (2013). *Report of the high level committee on balanced regional development issues in Maharashtra*. Planning Department, Government of Maharashtra.
- GoM. (2014a). *Economic survey of Maharashtra 2013-14*. Mumbai: Directorate of Economics and Statistics, Planning Department, Government of Maharashtra.
- GoM. (2014b) *Fourth Maharashtra Finance Commission Report: Volume 1*. Government of Maharashtra. Retrieved from [https://finance.maharashtra.gov.in/Sitemap/finance/pdf/MAHARASHTRARAJYA\\_4TH\\_AWAHAL\\_English.pdf](https://finance.maharashtra.gov.in/Sitemap/finance/pdf/MAHARASHTRARAJYA_4TH_AWAHAL_English.pdf)
- GoM. (2015). *Economic survey of Maharashtra 2014-15*. Mumbai: Directorate of Economics and Statistics, Planning Department, Government of Maharashtra.
- GoM. (2016). *Maharashtra's economy in figures 2016*. Mumbai: Directorate of Economics and Statistics, Government of Maharashtra.
- GoM. (2017a). *Economic survey of Maharashtra 2016-17*. Mumbai: Planning Department, Directorate of Economics and Statistics, Government of Maharashtra.
- GoM. (2017b). *Infrastructure statistics of Maharashtra State 2013-14 and 2014-15*. Mumbai: Planning Department, Directorate of Economics and Statistics, Government of Maharashtra.
- GoM. (2018). *Economic survey of Maharashtra 2017-18*. Mumbai: Directorate of Economics and Statistics, Planning Department, Government of Maharashtra.

- Gowrish, P. (2015). *Role of rural infrastructure in economic development a case study of ChamaraJanagar district*. Unpublished PhD. Thesis, University of Mysore.
- Hirschman, A. (1958). *The strategy of economic development*. New Haven, Conn. USA: Yale University Press.
- IDFC Rural Development Network. (2014). *India rural development report 2013-14*. New Delhi: Orient BlackSwan.
- ILO (2018). *Creating Jobs through Public Investment*. Employment Intensive Investment Programme, Geneva: International Labour Organization.
- IMF (2018). *World Economic Outlook, April 2018*. Washington, D.C.: International Monetary Fund.
- India Brand Equity Foundation [IBEF]. (2018) *Infrastructre sector in India*, New Delhi. Retrieved from <https://www.ibef.org/industry/infrastructure-sector-india.aspx>
- India Human Development Report 2011: *Towards Social Inclusion*. Institute of Applied Manpower Research. Planning Commission. Govenment of India
- Ishikawa, S. (1967). *Economic development in Asian perspective*. Tokyo: Kinokuniya Bookstore Co.
- Kalamkar, S. S. (2011). Patterns and determinants of agricultural growth in Maharashtra. *Artha Vijnana*, 53(2), 156-181.
- Kannan, E. (2011). *Determinants of stagnation in production of important crops, Research report*. Bangalore: Institute for Social and Economic Change.
- Kundu, S. (2013). Rural infrastructure. *Employment News*. Vol. 38(33), 16-22 November issue. Retrieved from [http://www.employmentnews.gov.in/Editorial-33-\(ENG\).pdf](http://www.employmentnews.gov.in/Editorial-33-(ENG).pdf)
- Kundu, T. (2015). Why Kerala is like Maldives and Uttar Pradesh. Live Mint. [online] Available at: <https://www.livemint.com/Politics/3KhGMVXGxXcGYBRMsmDCFO/Why-Kerala-is-like-Maldives-and-Uttar-Pradesh-Pakistan.html> [Accessed 7 May 2018].
- Lewis, A. W. (1955). *The theory of economic growth*. Milton Park: Routledge.
- Maharashtra State Data Bank (n.d.). *Maharashtra's socio-economic indicators compared with other States*. Directorate of Economics and Statistics, Planning Department, Government of Maharashtra. Retrieved from <https://mahasdb.maharashtra.gov.in/miscReport.do>
- Maps of India, <https://www.mapsofindia.com/maps/maharashtra/maharashtra.htm> Retrieved 10 March 2018.
- Mellor, J. W. (1976). *The new economics of growth: A strategy for India and the developing World*. New York: Cornell University Press.
- Mody, A. (Ed.). (1997). *Infrastructure strategies in East Asia: The untold story*. World Bank.

- Mohanty, B. B. (2009). Regional disparity in agricultural development of Maharashtra. *Economic & Political Weekly*, 44(6), 63-69.
- NABARD (various years). *Annual report*. Mumbai: National Bank for Agricultural and Rural Development.
- Narayanamoorthy, A. & Deshpande, R. S. (2005). *Where water seeps!: Towards a new phase in India's irrigation reforms*. New Delhi: Academic Foundation.
- National Sample Survey Office (NSSO). (2014). *Drinking water, sanitation, hygiene and housing condition in India*. Report No. 556, NSSO 69th Round, Ministry of Statistics and Programme Implementation. New Delhi: Government of India.
- Nayak, C. (2014). Rural infrastructure and cropping intensity in Odisha. *IOSR Journal of Economics and Finance*, 2(6), 05-09.
- NCAER. (1977). *Cost benefit study of selected rural electrification schemes in MP and UP*. New Delhi: National Council of Applied Economic Research.
- Niti Aayog. (2018). *Deep dive: Insights from champions of change, the aspirational districts dashboard*. New Delhi: Niti Aayog.
- Ostrom, Elinor, Schroeder, L., & Wynne, S. (1993). *Institutional Incentives and sustainable development: Infrastructure policies in perspective*. Boulder, CO: Westview Press.
- Planning Commission. (2014). *Report of the expert group to review the methodology for measurement of poverty*. New Delhi: Government of India.
- Pinstrup-Andersen, P. & Shimokawa, S. (2008). Rural infrastructure and agriculture development. In F. Bourguignon, & B. Pleskovic (Eds.), *Rethinking Infrastructure for Development* (pp. 175-204). Washington, D.C.: World Bank.
- Ramachandran, V. K., & Swaminathan, M. (2002). Rural banking and landless labour households: institutional reform and rural credit markets in India. *Journal of Agrarian Change*, 2(4), 502-544.
- Rosenstein-Rodan, P. N. (1943). Problems of industrialisation of eastern and south-eastern Europe. *The Economic Journal*, 53(210/211), 202-211.
- Rostow, W. W. (1960). *The stages of growth: A non-communist manifesto*. Cambridge University Press.
- Rosenzweig, M. R., & Wolpin, K. I. (1993). Credit market constraints, consumption smoothing, and the accumulation of durable production assets in low-income countries: Investments in bullocks in India. *Journal of Political Economy*, 101(2), 223-244.

- Sarma, A. (2013). *An investigation into the status of rural infrastructure and its impact on the rural economy of Assam*. Guwahati: Unpublished PhD. thesis, Gauhati University. Retrieved from <http://shodhganga.inflibnet.ac.in/handle/10603/29214?mode=full>
- Shah, T, (1993). *Groundwater markets and irrigation development: Political economy and practical policy*. New Delhi: Oxford University Press.
- Shah, T.; O. P. Singh and A. Mukherji (2006). Some aspects of South Asia's groundwater irrigation economy: Analyses from a survey in India, Pakistan, Nepal Terai and Bangladesh. *Hydrogeology Journal*, 14(3), 286-309.
- Shroff, S., Kajale, J., & Bodkhe, N. (2015). Agrarian distress: case of Maharashtra. *Agricultural Situation in India*, December, 58-66.
- Socio Economic and Caste Census 2011. Government of India. Retrieved from <http://secc.gov.in/stateSummaryReport>
- Spears, D., Ghosh, A., & Cumming, O. (2013). Open defecation and childhood stunting in India: an ecological analysis of new data from 112 districts. *PloS one*, 8(9), e73784.
- Suryanarayana, M. H. (2009, June 27). Intra-state economic disparities: Karnataka and Maharashtra. *Economic and Political Weekly*, 44(26/27), 215-223.
- Thorat, S., & Sirohi. (2004). *State of the Indian Farmer: Rural infrastructure* (Vol. 4). New Delhi: Department of Agriculture and Cooperation, Ministry of Agriculture, Government of India and Academic Foundation.
- Toyobo, A. E., Muili, A. B., & Adetunji, M. A. (2014). The relevance of infrastructural facilities to rural housing development in Iagelu local government Oyo State, Nigeria. *International NGO Journal*, 9(3), 29-34.
- Vaidyanathan, A.; Krishnakumar, A. ; Rajagopal, A. & Varatharajan, D. (1994). Impact of irrigation on productivity of land. *Journal of Indian School of Political Economy*, 6(4), 60-145.
- van de Walle, D. (2002). Choosing rural road investments to help reduce poverty. *World Development*, 30(4), 575-589.
- World Bank. (1994). *World development report: Infrastructure for development*. Washington, D. C.: World Bank.
- YASHADA. (2014). *Maharashtra human development report 2012: Towards inclusive human development*. Pune: Yashwantrao Chavan Academy of Development Administration (YASHADA).



## About Report

This study titled 'Rural Development Infrastructure Index Including Physical, Social and Institutional Dimensions' provides relative performance of infrastructure availability in rural Maharashtra covering 33 districts of 8 agricultural divisions. The Rural Development Infrastructure Index (RDII) was constructed using Principal Component Analysis (PCA) across the three dimensions - Physical Infrastructure Index (PII), Social Infrastructure Index (SII) and Institutional Infrastructure Index (III) using 28 parameters. The findings of the study indicate significant divergence in the availability of physical, social and institutional infrastructure across several districts that have performed poorly and rank below the state's average score. The study also finds significant inter-division inconsistency in infrastructure development. More specifically, the study confirms that the divisions of Kolhapur, Pune and Konkan are best performing, while Aurangabad, Latur, Amravati and Nasik divisions are laggard with respect to the requisite infrastructure. Considering the sizeable infrastructure gaps across districts and divisions, the study recommends that the Government of Maharashtra (GoM) should undertake appropriate interventions with the objective of addressing the physical, social and institutional infrastructure bottlenecks at the district level.

## About Symbiosis School of Economics

Symbiosis School of Economics (SSE), instituted in 2008, is a Department of Symbiosis International (Deemed University). Now in its tenth year, SSE is a bright, young, vigorous and growing institution, with a demonstrable record of success. The School offers Undergraduate and Postgraduate programs in Economics and Applied Economics, providing academic rigour that shall help develop intellectual discipline, critical as well as analytical assessment, creating a class of rational thinkers, equipped with an understanding of the need for constrained optimization, and a strong urge to strive towards attaining equilibrium. The faculty and students alike are engaged in diverse pioneering research projects, fostering momentous collaborations with NABARD, INHAF, Avantha Foundation, Chest Research Foundation, to name a few, which are actively involved in areas concerning rural, urban, trade and development issues. The academic environment offers knowledge and skill set to students, translating into meaningful employment opportunities and overall placement in the society at large. The broader long-term vision of the School is to progressively evolve as an illustrious think tank.



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