

**INFORMATION AND COMMUNICATION TECHNOLOGIES (ICTs) IN  
GOVERNANCE: A SOCIOLOGICAL STUDY IN RURAL ODISHA**

*A thesis submitted during 2023 to the University of Hyderabad in the partial fulfilment of  
the award of*

**DOCTOR OF PHILOSOPHY  
IN  
SOCIOLOGY**

**BY**

**DHIRENDRA KUMAR SAHOO  
16SSPH03**



**DEPARTMENT OF SOCIOLOGY  
SCHOOL OF SOCIAL SCIENCES  
UNIVERSITY OF HYDERABAD  
HYDERABAD-500046  
TELANGANA, INDIA**



**DEPARTMENT OF SOCIOLOGY  
SCHOOL OF SOCIAL SCIENCES  
UNIVERSITY OF HYDERABAD  
HYDERABAD-500046**



---

**DECLARATION**

I, **Dhirendra Kumar Sahoo** hereby declare that this thesis entitled “**Information and Communication Technologies (ICTs) in Governance: A Sociological Study in Rural Odisha**” submitted by me under the guidance and supervision of Prof. C. Raghava Reddy is a bonafide research work. I also declare that this thesis has not been submitted previously in part or full to this University or any other University or Institution for the award of any degree or diploma.

**Place: Hyderabad**

**Date: 25/08/2023**

**Dhirendra Kumar Sahoo**

**Registration No: 16SSPH03**



DEPARTMENT OF SOCIOLOGY  
SCHOOL OF SOCIAL SCIENCES  
UNIVERSITY OF HYDERABAD  
HYDERABAD-500046



CERTIFICATE

This is to certify that thesis entitled “**Information and Communication Technologies (ICTs) in Governance: A Sociological Study in Rural Odisha**” submitted by **Dhirendra Kumar Sahoo** bearing Registration Number **16SSPH03**, in partial fulfilment of the requirements for the award of Doctor of Philosophy in Sociology is a **bonafide work carried out by him under my supervision and guidance.**

This thesis is free from Plagiarism and has not been submitted previously in part or in full to this or any other University or Institution for award of any degree or diploma.

Further, the student has the following publications

1. Sahoo, D. K. and Jena, A. (2023) Panchayat: Casteism and mockery in the name of humour. *Economic & Political Weekly*, 58(17) 65-66.
2. Sahoo, D. K. and Sahoo, P. K. (2020) Efficiency, productivity dynamics and determinants of productivity growth in Indian telecommunication industries: An empirical analysis. *Journal of Public Affairs*, 22(1) 1-8.

and

has made presentations in the following conferences

1. Presented a paper entitled “ICTs and Governance Journey of India: Looking through Common Service Centre (CSC)” in the International Conference on “Local Governance in India @75: Issues, Challenges, and Contemporary Developments” organised by Centre for the Study of Law and Governance, Jawaharlal Nehru University, New Delhi held on 25-26 March 2023.
2. Presented a paper entitled “Mapping Digital Technology and Social Media: The Impact of the ICTs on Youth in India.” in the 13th edition of the Slovenian Social Science Conference “Digital Society and Sustainability”, organised by Slovenian National Committee of the UNESCO Management of Social Transformations Program (MOST), and School of Advanced Social Studies, Nova Gorica, Slovenia, Europe in cooperation with Slovenian Social Science Association and International Sociological Association (ISA) held on 11-13 November 2021.

Further, the student has student has passed the following courses towards fulfilment of coursework requirements for Ph.D.

| Sl. No. | Course No. | Title of the Course                    | Credit | Pass/Fail |
|---------|------------|----------------------------------------|--------|-----------|
| 1       | SL-801     | Advanced Sociological Theory           | 4      | Pass      |
| 2       | SL-802     | Advanced Research Methods              | 4      | Pass      |
| 3       | SL-822     | Science Technology and Society Studies | 4      | Pass      |

**Prof. C. Raghava Reddy**  
Supervisor  
Department of Sociology

**Prof. C. Raghava Reddy**  
Head  
Department of Sociology

**Prof. Jyotirmaya Sharma**  
Dean  
School of Social Sciences

## ACKNOWLEDGEMENT

Every Ph.D. candidate's journey is distinct and unique in its own right. My journey is no different. As I write this acknowledgement, one thing that comes to mind right away is how grateful I am for this incredible journey from 2016 to 2023. Yes, gratitude is the term that best describes my Ph.D. journey. Because I think a Ph.D. thesis is not the work of a single individual, and my Ph.D. experiences have been formed and led by many wonderful individuals who have graciously supported and accommodated me, as well as provided the essential room for my ideas to bloom.

Writing a Ph.D. thesis can be a challenging endeavour, it might be tough in many instances, but it can also be thrilling and fulfilling. This is to thank everyone who has helped me in various ways and abilities to accomplish this research.

First and foremost, I would like to convey my sincere gratitude to my Supervisor, my Mentor, my Guruji Prof. C. Raghava Reddy, with whom I collaborated on this Ph.D. journey. It gives me immense pleasure and satisfaction to express my heartfelt and sincere gratitude to my supervisor for his continuous cooperation, encouragement and kind guidance. I am highly indebted to him for giving me the opportunity to work under his supervision and for providing complete freedom to express my thoughts and explore the area I wanted. Since the day I joined at the Department of Sociology, he has not only been my research guide, but also a guardian who has always been quite helpful to me in both academic and personal fronts. Sir, it has been an honour to work with you and learn from you. Thank you so much Sir for everything.

I am also greatly thankful to the members of my Doctoral Research Committee (DRC), Prof. G. Nagaraju and Prof. Madhavi Ravi Kumar for their valuable suggestions and encouragement at various stages of the Ph.D. journey. I am extremely thankful to all the faculty members of the Department of Sociology for their timely help and encouragement, especially for interesting courses they taught me as a part of the course work.

I am highly indebted to my beautiful **“University of Hyderabad”** a land full of Sukoon knowledge, for building my career. I am especially grateful to my university professors in the Department of Sociology and other Department as well. Their knowledge and guidance always cherish throughout my life. Prof. Sujata Patel, Prof. Sasheej Hegde, Prof. Purendra Prasad, Prof. Aparna Rayprol, Prof. G Nagaraju, Prof. Satyapriya Rout, Department of Sociology, UoH. Prof. Debashish Acharaya, Dr. Pragngya Paramita Mishra, School of Economics. Prof.

Sujit Mishra Director, CSD Hyderabad and Dr. Siddharth Satpathy, Department of English and Dr. Pramod Kumar Mishra, School of Management, Dr. Subhashis Rana, Dr. Meera Padhy, Centre for Health Psychology. They were all immensely helpful in shaping my academic career.

I would like to express my heartfelt gratitude to the department office's incredibly supportive staff members: Mr. Chandra Kumar Gaaru, Late Mr. Srinivas Gaaru, Mrs. Geeta. I greatly appreciate their willingness to assist me whenever I sought them for assistance.

My field work and data collection would not have been possible without the unconditional support of Dr. Binita, Banka bhai and Chinamaya. I thank each one of them from the bottom of my heart. I would like to thank all the 240 respondents whom I interviewed and for their cooperation and support in the collection of data. I appreciate their willingness to put their trust in me. I would not have been able to collect such thorough data had they not opened up and shared the most challenges and nuanced aspects of their lives with me.

I am grateful to the university administration in general for providing us with a superb academic environment that allows us to make the most of our time here as researchers. I would also want to thank the personnel at the Men's Hostel E Annexe and NRS for their concern and assistance in making our stay at the hostel as pleasant as possible. I would like to thank IGML, UoH for their assistance and cooperation in library.

Financial support from my loveable family and research fellowship (JRF & SRF) from the University Grants Commission (UGC), New Delhi, and University of Hyderabad, Hyderabad, India is greatly acknowledged.

I want to express my sincere gratitude to all of my past teachers at school, colleges and university. I would also want to thank my professors at Ravenshaw University and Pondicherry University for instilling the appropriate academic ideals and orientations in the early years of my academic career. I genuinely appreciate their contributions. This place was and will always remain very close to my heart. I still enjoy the happy moments and unforgettable memories that I had with my RU-friends and Pondy-friends. I sincerely thank my batch-mates, seniors and juniors.

My life inside the department has always been an unforgettable journey with my colleagues, who have always been very much kind to me. I am grateful to them for the opportunity to work

with such talented people. I have enjoyed a lot working with each one of them. I particularly thank Abash for his valuable help in different times. I also value my association with Rakesh Anna, Lalatendu bhai, Damburu bhai, Subhra bhai, Devi bhai, Prasanta bhai, Arpita di, Pawani, Arosmita and Bijay. I specially thanks to Swayam Sikha, Aniruddh, Pavani, Pradipta bhai for their valuable time during my last stage of Ph.D. submissions.

Since the day I joined UoH, I have been blessed with many caring and affectionate seniors, juniors and friends. I would like to express my sincere thanks to all my seniors; Tapan Bihari bhai, Ansuman bhai, Bapi bhai, Subhra bhai, Dambru bhai, Joshi bhai, Pinku bhai, Goura bhai and Rasmi di, Sonali di, Tapan bhai, Pratap bhai, Ranjit bhai, Dinabandhu bhai, Dibakar bhai, Sushant bhai, Jaganath bhai, Abhaya bhai, Ajit bhai and Rakesh Anna, Uday Anna, Mahesh Anna, Shravan. I will cherish each and every moment I have spent with them throughout my life. I am very much thankful to all my friends Kunal, Nitya, Simple, Kali Kumar, Manas, Dhrub, Bandita, Atasi, and Rekha and my lovable juniors Tanmaya, Dillip, Jaykrishna, Suman, Samar, Sourav, Golok, Anirudha, Dhaneswar, Padia, Sailendra, Raturaj, Samar, Kartik, Sachi, Soumya and many others, with whom I have shared many unforgettable moments in this campus. I specially thanks to the social media WhatsApp group named Balunga Group, Ala re Ala, Udata Padia and Non-Veg Lover and other educational group.

During my stay at various hostels for more than 15 years, I met some amazing people: Lulu, Anil, Rakesh, Biswajit, Swaraj, Raj, Manmanth bhai, Chinu bhai, Gyana bhai, Pradipta bhai, Miki bhai, Papesh bhai from New hostel, Ravenshaw University. Raja, Rudresh, Sangay, Amlan, Vanja, Rahul bhai from Kannadasn hostel, Pondicherry University. I had spent a wonderful time with them. I am really lucky to have had them as my room-mates and feast-mates. I value my close association with some good friends from the NRS hostel (D & F-wings) which includes Raj bhai, Prashant bhai, Shankar, Saddam bhai, Kali Kumar, Nitya, Abash, Tanmaya, Jaykrishna, Dillip, Suman, Shawtrik, Sourav, Anirudha and Debnath.

I want to give special thanks Lok Sabha Secretariat, Parliament of India my current working place, without this place I wouldn't have completed my thesis. I want to express my heartfelt gratitude to current mentor Mr. Prasenjeet Singh, Additional Secretary, Lok Sabha Secretariat, Parliament of India. I am also greatly thankful to Mr. Pulin Bhutia and Mr. Prodash Panda, Joint Secretary. Mr. Prasanta Kumar Mallick, Mr. Babulal Nayak, Mr. Satya Vijay Ram Directors of Lok Sabha Secretariat and my dear colleagues Abhijeet, Anand, Subham, Atul, Pradip, Akriti, Shubha, Radhika, Anand Prakash, Akanshya Mishra and Singh, Vivek bhai,

Vijay bhai, Deepak bhai, Sarika mam in particular, has been a continual source of encouragement and support since my joining days.

It is extremely difficult to forget the love of my life, I am blessed with very special people in my life, my Taki without her life would have been so colour-less. She is very special to me I am highly grateful to her for the amount of unparallel love, support and patience she has offered me and very special thanks to her for being an important part of my life.

I would have not reached this stage of life without the never-ending support, love and contribution of my mother (Malati Sahoo) father (Bajakishor Sahoo) and my family members Khageswar Sahoo, Pradipta Sahoo, Niharika Sahoo, Sumitra Sahoo and (Bhavyansh Sahoo). They have always been source of tireless motivation and inspiration for me. The endless struggle, sacrifices and effort of my parents to my academic journey can never be expressed in words. I owe everything to them. I would like to express my heartfelt gratitude to my dear brothers whose unwavering support and encouragement have been instrumental throughout my academic journey and the completion of this thesis. I would like to thank all my relatives and village people for their valuable support, love and encouragement since my childhood.

Last but, not the least, those who are distant but close to my soul accompanying me all the time when I am facing the odd, make me laugh, sharing my grief, and cherishing my joy, will always be remembered by me.

I sincerely apologise if I forget to mention your name but that in no way diminishes the support, I have received from a number of people throughout my Ph.D. journey. I honestly want to thank all the people who have been directly or indirectly played a role in my life, yes, I really mean it.

Thanks a lot, to each and all once again!!

**Dhirendra**

# CONTENTS

|                                                                                                            | <b>Page No.</b> |
|------------------------------------------------------------------------------------------------------------|-----------------|
| Declaration                                                                                                | I               |
| Certificate                                                                                                | II              |
| Acknowledgments                                                                                            | III-VI          |
| Contents                                                                                                   | VII             |
| List of Tables                                                                                             | VIII            |
| List of Figures                                                                                            | IX              |
| Abbreviations                                                                                              | X-XII           |
| <b>Chapter 1 Introduction: Theme, Method, and Structure</b>                                                | <b>1-21</b>     |
| <b>Chapter 2 ICTs in Governance: A Sociological Appraisal</b>                                              | <b>22-46</b>    |
| <b>Chapter 3 ICTs in a Socio-technical Paradigm: Policy and Practice</b>                                   | <b>47-90</b>    |
| <b>Chapter 4 ‘Networked’ Villages: Social Construction of E-Governance<br/>Initiatives in Rural Odisha</b> | <b>91-139</b>   |
| <b>Chapter 5 Sociology of ICTs and Governance: Perceptions, Impacts and<br/>Inequalities</b>               | <b>140-152</b>  |
| <b>Chapter 6 Conclusion</b>                                                                                | <b>153-160</b>  |
| <b>References</b>                                                                                          | <b>161-173</b>  |
| Appendix 1 Publication of Articles                                                                         |                 |
| Appendix 2 Certificate of Conferences                                                                      |                 |
| Appendix 3 Photographs from the Field                                                                      |                 |
| Appendix 4 Plagiarism Report                                                                               |                 |

## List of Tables

| <b>Table No.</b> |                                                         | <b>Page No.</b> |
|------------------|---------------------------------------------------------|-----------------|
| Table 1.1:       | Data Collection Methods                                 | 15              |
| Table 1.2:       | Socio-economic Profile of Jagatsinghpur District        | 17              |
| Table 3.1:       | NeGP Project of GoI Services                            | 64              |
| Table 3.2:       | Tele density in India                                   | 67              |
| Table 3.3:       | Number of Common Services Centres (CSCs) in India       | 72              |
| Table 3.4:       | Rural Mobile Connectivity in India                      | 80              |
| Table 3.5:       | Statistics of Land Records in Odisha                    | 84              |
| Table 3.6:       | Fair Price Shops/e-PoS in Odisha                        | 84              |
| Table 3.7:       | CSC Centres in Ersama Block and VLEs                    | 88              |
| Table 3.8:       | Beneficiaries under NFSA and Fair Price Shops in Odisha | 88              |
| Table 4.1:       | Details of the Field Sites                              | 92              |
| Table 4.2:       | Gender Profile of the Respondents                       | 95              |
| Table 4.3:       | Age Profile of the Respondents                          | 97              |
| Table 4.4:       | Age and Gender Profile of the Respondents               | 97              |
| Table 4.5:       | Caste Profile of the Respondents                        | 97              |
| Table 4.6:       | Gender and Caste Profile of the Respondents             | 98              |
| Table 4.7:       | Gender and Educational Qualification of the Respondents | 99              |
| Table 4.8:       | Occupational Profile of the Respondents                 | 100             |
| Table 4.9:       | Gender and Occupational Profile of the Respondents      | 100             |
| Table 4.10:      | Income Level of the Respondents                         | 101             |
| Table 4.11:      | Income Category of the Respondents                      | 102             |
| Table 4.12:      | Access to Internet                                      | 103             |
| Table 4.13:      | Gender and Access to Internet                           | 103             |
| Table 4.14:      | Mode of Accessing Services Offered on ICTs Platform     | 104             |
| Table 4.15:      | Usage Pattern of Smartphones                            | 104             |
| Table 4.16:      | Number of visits to the ICTs                            | 106             |

## List of Figures

| Figure No.   |                                                         | Page No. |
|--------------|---------------------------------------------------------|----------|
| Figure 1.1:  | Geographical Location of Ersama Block                   | 19       |
| Figure 2.1:  | Perspective of STS                                      | 27       |
| Figure 3.1:  | Structure of E-Governance Interaction                   | 62       |
| Figure 3.2:  | Internet Penetration of India                           | 66       |
| Figure 3.3:  | Internet Users in India                                 | 67       |
| Figure 3.4:  | Wireless Subscriber base in India                       | 68       |
| Figure 3.5:  | Wireline Subscriber base in India                       | 69       |
| Figure 3.6:  | Common Service Centres in India                         | 71       |
| Figure 3.7:  | Social Media Users in India                             | 73       |
| Figure 3.8:  | Aadhaar Generation in India                             | 75       |
| Figure 3.9:  | Cumulative Aadhaar Generation in India                  | 76       |
| Figure 3.10: | Villages without Mobile Network                         | 80       |
| Figure 3.11: | Digital Identity (Aadhaar Generations in Odisha)        | 85       |
| Figure 4.1:  | Gender Profile of the Respondents                       | 96       |
| Figure 4.2:  | Age Profile of the Respondents                          | 96       |
| Figure 4.3:  | Caste Profile of the Respondents                        | 98       |
| Figure 4.4:  | Gender and Educational Qualification of the Respondents | 99       |
| Figure 4.5:  | Gender and Occupational Profile of the Respondents      | 101      |
| Figure 4.6:  | Income Category of the Respondents                      | 102      |
| Figure 4.7:  | Usage Pattern of Smartphones                            | 105      |
| Figure 4.8:  | Visit to CSC                                            | 106      |
| Figure 4.9:  | Purpose of Visit                                        | 107      |

## **ABBIRIVATION**

|       |                                                               |
|-------|---------------------------------------------------------------|
| AAY   | Antyodaya Anna Yojana                                         |
| ABBA  | Aadhaar-based Biometric Authentication                        |
| AI    | Artificial Intelligence                                       |
| APBS  | Aadhar Payment Bridge System                                  |
| APL   | Above Poverty Line                                            |
| APMC  | Agriculture Produce Market Committee                          |
| BHIM  | Bharat Interface For Money                                    |
| BPL   | Below Poverty Line                                            |
| BSNL  | Bharat Sanchar Nigam Limited                                  |
| CDMA  | Code Division Multiple Access                                 |
| CDMO  | Chief District Medical Officer                                |
| CSC   | Common Service Centre                                         |
| CUDO  | Communism Universalism Disinterestedness Organized Scepticism |
| DBT   | Direct Benefit Transfer                                       |
| DoT   | Department of Technology                                      |
| DRDA  | District Rural Development Agency                             |
| e-NAM | Electronic National Agriculture Market                        |
| e-PoS | Electronic Point of Sale                                      |
| FGD   | Focussed Group Discussion                                     |
| FPS   | Fair Price Shop                                               |
| FTO   | Fund Transfer Order                                           |
| G2B   | Government to Business                                        |
| G2C   | Government to Citizens                                        |
| G2E   | Government to Employees                                       |
| G2G   | Government to Government                                      |
| GIS   | Geographic Information System                                 |
| GSM   | Global System for Mobile Phone                                |
| ICT   | Information and Communication Technology                      |
| IoT   | Internet of Things                                            |
| IT    | Information Technology                                        |
| ITES  | Information Technology-enabled Service                        |
| JAM   | Jan Dhan Aadhaar Mobile                                       |

|          |                                                        |
|----------|--------------------------------------------------------|
| KYC      | Know Your Customer                                     |
| MGNREGA  | Mahatma Gandhi National Rural Employment Guarantee Act |
| MietY    | Ministry of Electronic and Information Technology      |
| MMP      | Mission Mode Project                                   |
| MTNL     | Mahanagar Telephone Nigam Limited                      |
| NeGP     | National E-Governance Plan                             |
| NFHS     | National Family Health Survey                          |
| NFSA     | National Food Security Act                             |
| NIC      | National Informatics Centre                            |
| NICNET   | National Satellite-Based Communication Network         |
| NLRMP    | National Land Records Modernisation Programme          |
| NMMS     | National Mobile Monitoring System                      |
| OBC      | Other Backward Classes                                 |
| OECD     | Organisation for Economic Co-operation and Development |
| PDS      | Public Distribution System                             |
| PMGDISHA | Pradhan Mantri Gramin Digital Saksharta Abhiyaan       |
| QR Code  | Quick Response Code                                    |
| R&D      | Research and Development                               |
| RoR      | Record of Rights                                       |
| RTO      | Regional Transport Office                              |
| S&T      | Science and Technology                                 |
| SAMS     | Student Admission Management System                    |
| SC       | Schedule Caste                                         |
| SCOT     | Social Construction of Technology                      |
| SDC      | State Data Centre                                      |
| SEBC     | Socially Educationally Backward Classes                |
| SFSA     | State Food Security Scheme                             |
| SHG      | Self Help Groups                                       |
| SPR      | Scientific Policy Resolution                           |
| ST       | Schedule Tribe                                         |
| STIP     | Science Technology and Innovation Policy               |
| STS      | Science Technology and Society                         |
| SWAN     | State Wide Area Network                                |

|        |                                                                  |
|--------|------------------------------------------------------------------|
| TD     | Technological Determinism                                        |
| TEC    | Telecentre Entrepreneur Course                                   |
| TPS    | Technology Policy Statement                                      |
| TRAI   | Telecom Regulatory Authority of India                            |
| UIDAI  | Unique Identification Authority of India                         |
| UNDP   | United Nations Development Programme                             |
| UNESCO | United Nations Educational, Scientific and Cultural Organization |
| UPI    | United Payment Interface                                         |
| USOF   | Universal Service Obligation Fund                                |
| VLE    | Village Level Entrepreneur                                       |

# CHAPTER 1

## INTRODUCTION: THEME, METHOD, AND STRUCTURE

‘Information technology is changing the world.’

(Lyon, 2013)

### Introduction

Innovations in Information and Communication Technologies (ICTs)\* is taking the world into a digital era. The digital age offers opportunities and challenges in processing information and making it available to various users. ICTs play a vital role in reaching out to individuals, communities and organisations in developing countries. With the increasing presence of ICTs in the form of computers, smartphones, bandwidth, data and 4G/5G in the rural hinterlands, the social transformation witnessed is unprecedented. While knowledge has been the key for development, now information is ruling the present development paradigm. ICTs is the driving force of today’s global economy.

Many social and economic revolutions have taken place throughout history. These revolutions, beginning with the agricultural, followed by the industrial, and finally arriving at the information and communication, have altered the face of humanity. The digital revolution based on ICTs is changing the pace of advancement, offering many possibilities to reshape society, culture, and lives in many ways.

ICTs is become an integral part of governance in modern societies. It includes using technology, such as computers, the internet, and telecommunications to store, process, transmit, and retrieve information. Incorporating ICTs in governance has transformed the traditional administrative processes, enabling governments to enhance efficiency, transparency and citizen participation.

ICTs has been playing an essential role in the contemporary society. The growing adoption of ICTs-based services related to government services, market-linked services, health care services, educational services, etc., has been the hallmark of contemporary civil society.

---

\* Information and Communication Technologies (ICTs) is used as a generic term and hence it is mentioned as ICTs in the entire thesis.

Cutting across rural-urban, gender, class, and age divisions, ICTs has become an inseparable part of everyday life. The development of ICTs applications and the adoption of these ICTs-based services by people is of greater concern to sociologists. ICTs in governance in particular attracted the attention of sociologists to analyse its impact on power dynamics, social relationships, and the structure of the governance systems. This chapter attempts to examine the social process of negotiating with the ICTs and attempts at a sociological understanding of the social appropriation of technology, i.e., ICTs in a rural setting. It focuses on how the internet and ICTs play a vital role in mediating, facilitating, and serving the rural citizens.

### **The Contextual Background of ICTs**

The contextual background of ICTs encompasses the historical, technological, and socio-economic factors that have shaped their development and widespread adoption. The origins of ICTs can be traced back to early advancements in communication technology, such as the telegraph and telephone, which revolutionized long-distance communication. The advent of computers in the mid-20<sup>th</sup> century marked a significant milestone, paving the way for the digital revolution. The rapid advancement of microprocessors, networking technologies, and the internet in the latter part of the 20<sup>th</sup> century laid the foundation for the emergence of the modern ICTs landscape.

ICTs in governance have the potential to empower citizens and promote inclusivity by providing them access to information, participation platforms, and avenues for expression. The democratising potential of ICTs lies in its ability to facilitate direct and decentralised communication between citizens and governments, breaking down the traditional hierarchical structures.

The ICTs field has witnessed phenomenal changes in the recent years. These local, regional, national, or global developments have ushered in a new epoch marked by greater interconnectivity and proximity among people, communities, and societies. While many people are excited about the new developments and want to explore their possibilities, others are sceptical. ICTs has become an indispensable component of daily life. People utilise them to acquire information, communicate with others, and address issues. The usage and applications of ICTs has increased over the last few decades as technical advances have resulted in the new types of information and communication technology (Garrett, 2006).

## **Significance of ICTs**

ICTs has profoundly impacted every aspect of society, transforming how people communicate, access information, conduct business, and engage in various activities. ICTs has revolutionised communication, media, healthcare, finance, education and entertainment industries. ICTs has also reshaped social interactions, bridged geographical distances, blurred geographical boundaries, and facilitated the exchange of knowledge and ideas on a global scale. They have become essential for economic growth, innovation and overall quality of life.

A critical examination of ICTs sheds light on the power dynamics and social inequalities arising from its adoption and access and vice-versa. How ICTs can reinforce or reconfigure the existing social structures and hierarchies is of significant importance to sociologists. Also, analysing how access to and control over ICTs resources are unequally distributed, leading to digital divides and reinforcing existing social inequalities is socially relevant to study given the extent of dependency on ICTs in the contemporary society.

Several studies have analysed the electronic government initiatives in India in terms of their impacts (Sahu et al., 2019; Dwivedi et al., 2019; Singh, 2020; Kalam, 2005; Patnaik & Pattnaik, 2020; & Pattnaik & Singh 2020; Wadhwa, 2020). There have been several empirical studies on the economic and social effects of ICTs, and the results are presented broadly highlighting how ICTs has revolutionised the economy, business, culture, and society (Bresnahan et al., 2002; OECD, 2004; Bhatnagar, 2004, 2009, Qureshi, 2015).

## **The Concept of ICTs and Governance**

ICTs refers to a broad range of technologies that facilitate communication and access to information, including the internet, mobile phones, radio and television, satellites, and other wireless technologies. These technologies have revolutionised how people access and use information, allowing individuals and organisations to communicate more quickly and effectively and to store and share data in new ways.

The World Bank defines “ICTs as the hardware, software, networks, and media that are used for the collection, storage, processing, transmission, and display of information (voice, data, text, and pictures), as well as the services that are associated with this information. ICTs contain features that facilitate communication in various formats as well as the storage, retrieval, analysis, and sharing of information” (World Bank, 2002). ICTs include a broad range of

technologies that are used by individuals in their day-to-day life. Since introducing the World Wide Web to the general public in 1989, there have been significant developments.

E-governance is the use of ICTs to improve the services of government to its citizens. Information and communication technologies are used to take government services to the people's doorsteps thus improving efficiency, accountability, and transparency. E-governance can include providing services to citizens electronically, as well as the use of technology to manage the administration of government services. Examples of e-governance activities include online access to government information on services and social welfare schemes.

During the 1970s, India laid the foundation for e-governance, which first focused on developing and deploying information technology to handle data-intensive operations such as those connected to elections, censuses, tax administration, and other similar areas. The National Informatics Centre's (NIC) efforts throughout the 1980s to link the district headquarters were the first steps in that direction. The states adhered to a three-tiered e-governance system consisting of a State Wide Area Network (SWAN), a State Data Center (SDC), and a Common service centre (CSC), which connected all districts through ICTs networks (Wallace, 2012).

### **Evolution of ICTs and e-Governance**

When people hear the word 'technology,' they think of computers and cell phones. However, technology has been around for a long time. During the Stone Age, people learned how to use fire and make tools out of stone, which were very useful. Stone tools changed how people in the past lived in the same way digital technology has changed how we live today; from the first calculator, which was an abacus made in Babylon in 2400 BCE, to the computer, which Charles Babbage made in 1882.

Significant advancements and transformative changes in the delivery of government services, citizen engagement, and administrative processes have marked the evolution of e-governance in India. Since the 1990s, India has recognised e-governance as a significant area for implementing governance reform (Sreekumar & Rivera, 2008; Sreekumar, 2011; Madon, 1993; Madon & Krishna, 2018). In the years after India's economy was liberalised, there was a boom in the information technology (IT) industry, which is often mentioned as one of the primary reasons for the expansion of e-governance.

As per the 2011 Census, about 6.5 lakh villages in India constitute 72 percent of the total population (Census, 2011). Rural development has always been the highest priority of the government after independence. Rural development is not just about developing infrastructure but also about providing welfare measures for the needy poor. Successive governments in India, after independence, launched several welfare programmes in the direction of poverty reduction, particularly in rural areas. The reach of the government welfare programmes was always a problem owing to the lack of efficient implementation and monitoring mechanisms. Development administration was found to be lacking in controlling corruption, pilferage, diversion of funds, undeserving beneficiaries, etc. With new technologies like ICTs, the development administration began using them to the best possible levels to reach out to the poor and the needy. Telecommunication, the internet, and digital technologies have become the primary tools in the hands of the state in its efforts towards e-governance. Through the digitisation of government and the economy, digital technology ecosystems are now at the core of development strategies in India.

India began laying the foundation for its ICTs infrastructure by establishing the National Informatics Centre (NIC). The NIC was pivotal in developing network connectivity, setting up computerised systems, and facilitating data sharing among government departments. The introduction of the National Satellite-Based Communication Network (NICNET) in 1987 enabled efficient communication and data transfer across the country. The foundation of e-governance is a precise and all-encompassing information system. With the help of electronic governance, stakeholders may communicate and share information meaningfully, which is essential to a functioning democracy. To encourage citizens to participate in local, state, and central government decision-making, e-governance has been recognised as a democratic dividend by many academics (Bhatnagar, 2009).

NIC has been a leading force over the last three decades. Mobile technology, cloud computing, big data, artificial intelligence, blockchain, and the internet of things are just some technological advancements that are continually altering the landscape. As an organisation that has made significant contributions to R&D in the past, NIC is constantly working to improve its internal R&D activities to conduct more research in the appropriate fields and provide the government with evidence of widespread improvements in its technology usage and management.

Web-based technologies, and internet adoption have been a policy priority for central and state governments since the late 1990s. India has been a keen adopter of information technology advances, which reshaped the country's society and economy, including rural growth, service provision, government administration, education services, etc. The Information Technology (IT) Act of 2000 and the National e-Governance Plan (NeGP) of 2006 are the two crucial laws and regulations made in the field of policy pertaining to e-governance in the country. They were instrumental in the institutionalisation of e-governance efforts and streamlining of investment in this sector. The National e-Government Plan (NeGP), which includes 27 Mission Mode Projects (MMPs) at the Center, state and grassroots levels, has enabled digital empowerment. The NeGP aims to enhance government service delivery to residents and businesses, making them available to everyone via convenient service delivery outlets at affordable pricing (PIB, 2010). The NeGP takes a comprehensive approach to transform India's e-governance system, which previously lacked a region consisting of several autonomous administrative experiments. The NeGP consisted of three core components: State Wide Area Networks (SWANs), State Data Centers (SDCs), and Common Service Centers (CSCs). These initiatives focused on connecting government offices, establishing data centers for securing data storage, and providing access points for citizens to avail government services.

### **ICTs in the Global Context**

The world is staring at the fourth industrial revolution. According to Schwab (2017), the fourth industrial revolution, a continuation of the third industrial revolution, is defined as “a fusion of technologies that are blurring the barriers between the physical, digital, and biological domains”. Processing and storage capacities are increasing at an exponential rate, and knowledge is becoming more accessible to a greater number of people than at any other time in history. The new technologies, such as the Internet of Things (IoT), mobile internet, artificial intelligence (AI), quantum computing, virtual and augmented reality, cloud technology, advanced robotics, biometric technology, blockchain, and e-rupee or digital rupee are the driving force behind this revolution. These technologies are becoming the future, offering even more opportunities for human development and subsequently changing the social landscape.

Internet, mobile applications, social media, and other digital communications technologies are now an integral part of the everyday lives of billions of people worldwide. Over five billion people were using the internet worldwide as of April 2022, equivalent to 63.1 percent of the

total population. In total, there were 4.7 billion people who used social media, representing 59 percent of the world's population (Statista, 2022).

### **ICTs in the Indian Context**

ICTs is essential to developing and developed countries' development agendas. It has a high potential for societal transformations by improving access to people, services, and information. (Heeks, 2008).

India has emerged as one of the fastest-growing telecommunications markets globally. After China, Indian telecommunications has become the second-largest wireless network globally. By the end of March 2023, the number of telephone subscribers in India is 117.32 crores (51.84 crores in rural areas and 65.39 crores in urban areas). The number of internet subscribers is 81 crores, with urban areas contributing more than half of it. As of 2023 the overall tele-density of India is 84.51 percent (DoT, 2023 and TRAI, 2023). The forecast on the internet users suggest that the number of internet users will cross 800 million in the near future (Sahoo & Sahoo, 2022; Majumdar, 2023).

The number of mobile phone users in rural India is increasing rapidly because of greater mobile penetration and the availability of affordable network. The National Family Health Survey 2019-21 (NFHS-5) found that 91.5 percent of rural households in India currently have a mobile phone. This represents an increase of 4.2 percent when compared to the findings of the NFHS-4 (2015-16). On the other hand, according to the findings of the NFHS-5, 41 percent of rural households now have access to the internet. This represents a 35.3 percent increase when compared to the findings of the NFHS-4 (NFHS-5 Report, 2019-21).

### **Diffusion of ICTs and the Digital Divide**

Globally, digital technology is expanding faster, yet it is not occurring equitably. Sixty percent of the world's population is online, with most residing in developed nations. In less-developed nations, just one in five individuals is online. Education, employment, and public services are increasingly dependent on internet access. Therefore, lack of connection is a major barrier to human progress. Rapid advancement in ICTs can provide late-industrialising countries with an opportunity to quickly catch up with more advanced nations via the rapid diffusion of ICTs (World Bank, 2005).

The ICTs advancement has revolutionised how people live, study, work, and interact worldwide. But it has also contributed to the development of a new kind of social divide, which consists of those with access to and the capacity to utilise ICTs and those without. In the 1990s, researchers and policymakers began focusing on the gap between digital haves and have-nots. The most common way to discuss the digital divide is about access to digital technologies. This gap includes unequal access to internet infrastructure, information, and knowledge. The idea of the digital divide comes from comparing social and informational inequality. This gap includes unequal access to internet infrastructure, information, knowledge, and opportunity based on income, race, ethnicity, gender, etc.

The digital divide concept is sociologically significant as it connotes discrimination and exclusion caused by the forces external to individuals in accessing digital technology and its enabled services (Kamath, 2018). More than the affordability and knowledge issues digital divide as a concept emphasises the extent to which the state attempts to provide infrastructure support to take the technology to the marginalised and poorer sections of the population (Norris, 2001). At another level, the notion of democratisation of technology talks about the extent to which the new software, apart from the affordability of the hardware, is accessible without the barriers programmed in the software, such as firewalls, paid access, etc.

The digital divide, therefore, is a social issue linked to the different amounts of information between those who have access to information and those who do not. The divide is within a given society and across countries, regions, cities, and businesses with different socioeconomic and cultural ICTs accessibility levels (Norris, 2001).

As a result of the growth of ICTs, computers, and telecommunications networks play an important part in all economies. The digital revolution has profoundly impacted many people's lives, yet it has failed to alter the lives of the most disadvantaged, particularly those living in rural areas. Due to the digital gap, its impact is not felt at the grassroots level. One of the most vital aspects of the digital divide is that it represents variations in access to modern ICTs across geographical areas or between individuals of different socioeconomic statuses (the international digital divide) (intra-national digital divide). A lack of knowledge of IT's benefits, lack of IT human resources, low rural tele density, and poor internet connectivity are all issues that contribute to the digital divide in rural areas.

Although ICTs has the potential to boost economic growth and improve people's lives, the actual benefits of ICTs can only be realised if people have access to computers and the Internet. The diffusion of ICTs is hampered by various technological, economic, social, and political factors in every developing country. Factors such as educational attainment, financial stability, political stability, and ICTs' affordability all come into play when it comes to gaining access. Research and development expenditures in developed countries allow them to use advanced information technology. Still, developing countries face the problem of overcoming the lack of physical and real ICTs' access (Selwyn, 2004; Heeks, 2017).

### **Sociology of ICTs**

The study of ICTs has its origins in American sociology. How new communication technologies affect society was the subject of some of the early studies. More than ninety years ago, Robert Park (1925) noted how 'modern methods' of transportation and communication, such as the automobile and the telephone, had extended chances for social connection and were quickly altering the social structure of daily life. Ernst Burgess (1925) stated that telephones' ability to sustain distant links caused local community decline. Other people in Chicago School of sociology looked at how changes in technology affected culture, family, race and gender relations, and society as a whole (Ogburn, 1922; Ogburn & Nimkoff, 1955).

The development of ICTs, their application, and the adoption of ICTs-based services by human agencies is a matter of great concern for sociologists. The mainstream social principles of technology are usually classified into this binary; technical determination or the social construction of technology (Johnson & Wetmore 2009). Technical determination principles emphasise how technical artifacts determine the course of history. On the other hand, the socialist constructivist theorists highlight how people use technological artifacts (Pinch & Bijker, 1984, Wajcman, 2008). Sociology and ICTs is well integrated and connected. As a result of the widespread application of ICTs, the scope of sociology reached a new horizon. Sociologists look beyond the software, hardware, and technical features of the digital networks to understand the societal structure and power dynamics (Latour, 1991, Wajcman, 1990).

Several structural changes occurred in society in the last three decades, with the emergence of ICTs ushering in a new technological paradigm. ICTs has penetrated into private and public living spaces. In everyday life, in some or more ways, people use digital technology frequently and depend upon digital activities like using smartphones, tablets, and smartwatches with different social media apps.

Most people completely rely on technology, whether for travelling through cab and bike aggregating services like Ola, Uber, and Rapido or ordering food and groceries on several platforms like Swiggy, Zomato, Blinkit, Jio Mart, etc. In addition, using numerous e-commerce applications such as Amazon, Myntra and Flipkart and online payment application like Google Pay, PhonePe, Cred and Paytm. People are now also talking to virtual assistants, such as speaking to Google with the phrase 'Hey Google,' Apple with 'Hey Siri,' and Amazon with 'Hi Alexa'.

The entire basket of ICTs, including smartphones, computers, internet broadband, and Wi-Fi technology, represents a new wave of general-purpose technologies in the twentieth century. In the new era of ICTs, people communicate in groups not just about personal matters but also about political, cultural, and economic aspects.

Social media became popular for offering two-way communication, allowing users to interact and engage with each other in various ways. Unlike traditional media, where communication was mostly one-sided (from the media source to the audience), social media platforms revolutionised how people communicate, share information, and connect online. Social media platforms enable users to create and share their own content, such as posts, photos, videos, and comments. This content can be seen, liked, shared, subscribed, and responded to by other users, fostering an interactive environment.

Castells observes that society has entered an information age where the economy completely depends on information and human development, not just on exchanging goods. He called the new social system a networked society with no limitations and restrictions (Castells, 2000). According to Castells, society is passing from an 'industrial age' to an 'information age.' This transpires due to the introduction of ICTs in the form of computers, smartphones, and technological gadgets. The science, technology and society researchers contend that technology should be seen as a 'socio-technical product' (Wajcman, 2002). In this line, Sassen (2002) offers a helpful analytical framework that considers how society and technology intersect. This allows us to detect diverse technologies embedded and varying effects on different social demands (Boeri, 2016).

## **ICTs and E-Governance**

E-governance services that use ICTs are transactional in nature and can be offered by any level of government. ICTs play an important role in making it easier for the government and the

public to share information and knowledge and changing how the government and the public work together. The UNDP says that every country's challenge is to develop a system of government that helps and supports human development. Governments worldwide have put a lot of money into information and communication technology to improve how they run things. In the 21st century, ICTs is changing how people live. The delivery of public services and the social and economic structure of local communities have both been improved by technological progress (UNDP, 2001).

E-governance is more than just computerisation in government offices; it is a fundamental shift in the way government functions and the information it provides to the public, businesses, and other organisations as a result of improvements in management and operational effectiveness achieved through the use of ICTs such as mobile phones and the internet, among other things. E-governance programmes aim to make government more accessible and efficient for the general population. Services are brought right to the customer's front door thanks to these initiatives regarding price and accessibility to the general public. All e-governance services may be divided into four broad categories, and they are G2G (government to government), G2C (government to citizens), G2B (government to business), and G2E (government to employees). Both business-to-consumer and business-to-government services are positively affecting society at large (Patnaik & Pattnaik, 2020).

ICTs are used to deliver government services, exchange data, communicate, transact, and integrate various stand-alone systems and services for the benefit of citizens, the private sector (including government contractors), and internal processes and interactions within the entire government framework. As the service provider, the government is responsible for incentivising its personnel to use ICTs to provide services. Efficiency, transparency, and citizen participation are the goals of e-government. Enabling e-governance through ICTs positively impacts the quality of government, accountability, trust, and transparency, as well as the welfare of citizens.

Good governance is critical to the growth of any country. It can be measured in terms of the availability of quality education, the effectiveness of public health care, the speed with which government services can be accessed, and so on. This can be done through the use of ICTs in all sectors of the economy and the execution of various e-governance programmes. Most government departments and agencies have tried to use the potential of ICTs that have not been used yet to provide services to citizens at any convenient location.

There are numerous e-governance programmes in place to provide residents with convenient access to various state and central government departments, district administrations, and local self-governments while streamlining government processes. E-governance has boosted accountability and transparency, making government services more convenient for citizens, reducing corruption, enhancing government efficiency, raising revenue, lowering costs, and improving the interaction between government and industry.

In India, information and communication technologies are used more often by governments to facilitate delivering their services to people in rural settings. The term e-governance describes the government's utilisation of ICTs to make state services affordable to its citizens. ICTs can be broadly viewed in two areas, information technology and communication. These two areas' growth has been significant in India in the last two decades. Indian IT has made a big difference in the software industry and information technology-enabled services (ITES).

The term good governance is fundamental, and e-governance is instrumental. The ICTs goal has been to minimise human contact while providing services to the public, and e-Government is a key factor in the empowerment of citizens. India is working to enhance the delivery mechanisms that would allow the most vulnerable citizens to benefit from government assistance programmes (Addo & Senyo, 2021).

### **E-Governance in Odisha**

E-Governance refers to the use of ICTs to provide government services and facilitate interactions between the government and citizens. It aims to improve efficiency, transparency, and accessibility in governance processes.

The situation before the adoption of e-government and the qualitative changes that have occurred after the deployment of e-governance is fascinating. It has been noted that the traditional method of manually processing files, which involved a significant amount of paperwork, has been replaced by a system that relies on digital communication and interaction. People now have access to open and transparent information far more easily than in the past since it can be found on government-run websites (Dhal, 2020).

E-Governance greatly helps in decreasing unnecessary costs at each level of governance, which has saved the public a huge amount of time and money. In previous versions of the system of governance, the primary focus was placed on rules, regulations, and conventions, the

application of which was entirely predicated on the official's point of view; when a degree of subjectivity is involved. It often fosters corrupt behaviors and gives service seekers preferential treatment. E-governance practices, which are digitally driven, have created an accountable, objective, and transparent environment. Because the software and the programming that comprise e-governance are organized in such a way, it is assured that information and services will be delivered instantly and without delay (Behera, 2020).

ICTs has the potential to promote social inclusion and empower marginalised communities. In Odisha, initiatives such as the Common Service Centers (CSCs) have played a vital role in bringing digital services to remote areas. These centers provide access to government services, internet facilities, and digital literacy programs, bridging the digital divide and empowering individuals and communities with valuable information and resources. By enabling access to education, healthcare, and government schemes, ICTs contribute to social empowerment and upliftment.

While ICTs has the potential to bridge gaps, they can also contribute to digital divides and social inequalities. Uneven access to ICTs infrastructure, particularly in rural and remote areas, perpetuates existing disparities. This digital divide can further marginalise vulnerable communities, hindering their access to information, education, and economic opportunities. Efforts to address this issue include providing digital infrastructure, initiatives to promote digital literacy, and targeted interventions to ensure equitable access to ICTs across all sections of society.

## **Objectives**

The rapid advancement of technology and science, particularly in ICTs, is causing new conditions to emerge in social welfare, education, health, and entertainment. The current ICTs services are undergoing many transformations, particularly in the social welfare scheme. Over the past decades, technology has changed the way of living, communicating, and interacting with each other. What impact do ICTs enabled governance made in the rural India? How do rural people understand ICTs based social welfare and governance initiatives in their efforts to take services from state? How new structural arrangements emerge in helping citizens accessing state services through ICTs based governance?

Therefore, there is a need for the study on the sociological aspects of ICTs. Understanding the impact of ICTs on society is crucial in our digital age. ICTs has become pervasive and influential, shaping our behaviors, interactions, and social structures. By examining the

sociological dimensions of ICTs, we gain insights into how these technologies are transforming societies globally and within the Indian context.

The specific objectives of the research are:

- To understand how ICTs are negotiated in rural areas.
- To examine how digital identities and inequalities are produced and reproduced through ICTs.
- To investigate the perceptions and impact of e-governance on the sociocultural and political spheres of rural society.
- To explore the relationship between state and citizens in the ICTs-led e-governance era.

The present study, a sociological study of ICTs in governance, aims to understand the interplay between technology and social structures within the governance context. The research is an empirical attempt to address the following specific questions.

- Do information and communication technologies help restructure social order, or do they reinforce it?
- How do ICTs generate and reproduce social inequalities?
- How do rural men and women negotiate state services through ICTs?
- What are the social, cultural, and political impacts of ICTs-led e-governance in rural areas?

## **Methodology**

The present study adopted both qualitative and quantitative techniques in data collection process. The researcher used both primary and secondary sources of data. Primary data has been collected using in-depth interviews, open-ended interview schedules, face-to-face semi-structured interviews, and focus group discussions. The researcher's engagement with the field sites for longer duration helped him to gain insights into the social reality.

Primary sources of data are the citizens and the users of ICTs Centres. The researcher collected data from those who visit Common Service Centres (CSC) for e-governance services, beneficiaries of social welfare schemes, village level entrepreneurs: those who are self-employed under government initiative of the Common Service Center; the public distribution system dealers, self-help group members (SHGs) and National Informatics Centre (NIC) and Odisha State Wide Area Network (OSWAN) officials. Additionally, interviews with villagers,

particularly those who visited the Common Service Center, have been conducted. Secondary data have been collected from different data sources like the Telecom Regulatory Authority of India (TRAI) report, Department of Technology, Ministry of Electronic and Information Technology, Statista report, Census, NFHS report, and e-governance website of social welfare scheme.

Field work was carried out in two villages, namely, Dhinkia and Ersama of Jagatsinghpur district of Odisha, focusing on e-governance implementation through common service centres. Data were collected using an interview schedule which included open-ended questions enabling respondents to express their own experiences. The researcher recorded the interviews using the mobile phone and a voice recorder and transcribed. Data were analysed using SPSS and NVivo. Table 1.1 presents the methodological matrix of data collection.

**Table No 1.1: Data Collection Methods**

| <b>Sl. No.</b> | <b>Method</b>                                              | <b>Respondents/Participants</b>                                                                                           | <b>Sampling</b>      |
|----------------|------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------|----------------------|
| 1              | Open-ended interview schedule and focused group discussion | Individuals, Users of CSC centers, and users of smartphones, Beneficiaries of government schemes, Self-help group members | Random and Purposive |
| 2              | In-depth interviews                                        | Village Level Entrepreneur, PDS dealer                                                                                    | Purposive            |
| 3              | Kye Informant Interviews                                   | Personnel employed in the CSCs, ICTs representatives and NIC, OSWAN officials                                             | Purposive            |

Purposive, random sampling techniques were used in the identification of respondents. Random sampling has been used for the household survey in the two study villages. Purposive sampling was used for identifying the users of the CSC for government related transactions, PDS dealers, SHG members and social welfare beneficiaries. The researcher also collected data through personal interaction with the functionaries of the ICTs network administrators in the district. Data were collected from 240 respondents from the two villages, Dhinkia and Ersama. The respondents are those who access CSC and are part of the users of ICTs-led e-governance service. In-depth interviews with representatives of the common service centre, village level entrepreneur who operates the CSC, self-help group members, and the public distribution service dealer who is called as rationwala by the villagers were conducted.

## **Profile of Odisha**

Odisha, formerly Orissa, is a state of India on the eastern coast which shares its borders with Jharkhand in the north and West Bengal in the northeast, Andhra Pradesh in the south, Chhattisgarh in the west, and the Bay of Bengal in the eastern coast. It is the 11<sup>th</sup> largest state in the country by area and the 8<sup>th</sup> largest state by population. The population of Odisha is largely rural, with 83 percent of the population residing in rural areas.

The state has 30 districts, 476 sub-districts, 223 towns, 6334 gram panchayats, and 51,313 villages. The total population of Odisha is 4,19,74,218; out of this rural population is 3,49,70,5162, and the urban population is 70,03,656. The Scheduled Caste (SCs) population constitutes about 17.1 percent, and Scheduled Tribe (STs) population constitutes 22.8 percent, and its total number stands at 7,188,463 and 9,590,756, respectively. The population density (persons per square kilometer) is 270, and the sex ratio is 979, while the rural area sex ratio is 989 and 932 in the urban area. The literacy rate is 72.9 percent (rural 70.2 percent and urban 85.7 percent). Male literacy is 81.6 percent, and female literacy is 64.0 percent (Census, 2011).

The state is known for its rich cultural heritage, natural resources, and diverse communities. Odisha has a history of indigenous governance systems based on community participation, cooperation, and collective decision-making. These systems were disrupted during the colonial period, as the British introduced a centralised governance system, which was hierarchical and authoritarian. Odisha experienced the emergence of democratic governance after independence. In recent years, there has been a renewed emphasis on e-governance in Odisha to improve government services and citizen participation in governance processes. The study villages are part of the Jagatsinghpur district of Odisha.

## **Profile of Jagatsinghpur District**

Jagatsinghpur district was created on April 1, 1993. It was previously part of the Cuttack district, which was later split into four districts for administrative reasons. Jagatsinghpur district shares its borders with Cuttack district in the west, Kendrapada district in the north, and Puri district in the south. The Bay of Bengal bounds it on the east side, making it prone to natural disasters like floods, cyclones, and unseasonal rainfall due to low pressure. The major hindrance to economic development of the district is natural calamities. The district is predominantly agricultural, as most people cultivate paddy, sugarcane, and cotton in the fertile soil made by the Mahanadi River. A section of the people of the coastal area depends upon

betel leaf farming, and fishing is also a main source of livelihood for several others in the region.

The district's economy is primarily agriculture, and few people depend on business. Paddy is the main food crop. Four rivers flow through Odisha into the Bay of Bengal. Subarnarekha, Brahmani, and Mahanadi rivers originate outside the state but flow through Odisha. Budhabalanga, Baitarini and Salandi originate in Odisha. Mahanadi is the major river of Odisha, with a catchment area spreading over 65,580 square kilometers, and Brahmani River, the second largest of Odisha, with a catchment area spreading over 39,033 square kilometers (Census Handbook, 2011).

**Table No 1.2: Socio-economic Profile of Jagatsinghpur District**

| Sl. No | Profile                                      | Number (percent)                                                 |
|--------|----------------------------------------------|------------------------------------------------------------------|
| 1      | Location                                     | Degree 86° 3' to 86° 58' East<br>Degree 19° 58' to 20° 23' North |
| 2      | The geographical area in a square kilometer  | 1668 sq. km.                                                     |
| 3      | Number of Subdivision                        | 1                                                                |
| 4      | Number of Tahasils                           | 8                                                                |
| 5      | Number of C.D. Blocks                        | 8                                                                |
| 6      | Number of Towns (including census towns)     | 2                                                                |
| 7      | Number of Municipalities                     | 2                                                                |
| 8      | Number of Gram Panchayats                    | 194                                                              |
| 9      | Number of Villages                           | 1292                                                             |
| 10     | Number of inhabited villages                 | 1223                                                             |
| 11     | Number of uninhabited villages               | 69                                                               |
| 12     | Sex Ratio (Number of females per 1000 males) | 968                                                              |
| 13     | Literacy Rate                                | 86.6 percent (rural 86.5 and urban 87.3)                         |
| 14     | Literacy Rate of Male and Female             | 92.4 percent and 80.6 percent                                    |
| 15     | The Density of Population                    | 682 per sq. km.                                                  |
| 16     | Number of Population                         | 11,36,971 (rural 89.8 and urban 10.2)                            |
| 17     | Number of Male Population                    | 5,77,865                                                         |
| 18     | Number of Female Population                  | 5,59,106                                                         |
| 19     | Number of S.C. Population                    | 2,48,152 (21.8)                                                  |
| 20     | Number of S.T. Population                    | 7862 (0.7)                                                       |

Source: District Census Handbook Jagatsinghpur, Odisha 2011

Jagatsinghpur is the smallest district in Odisha in terms of land area, with a total of 1,759 square kilometers. The total population of Jagatsinghpur district is 1,136,971, of which the male population is 1,020,991, and the female population is 1,159,80. Majority of the population, i.e., 89.80 percent, lives in rural areas and only 10.20 in urban areas. The literacy rate and sex ratio are 86.06 and 96.08 percent, respectively.

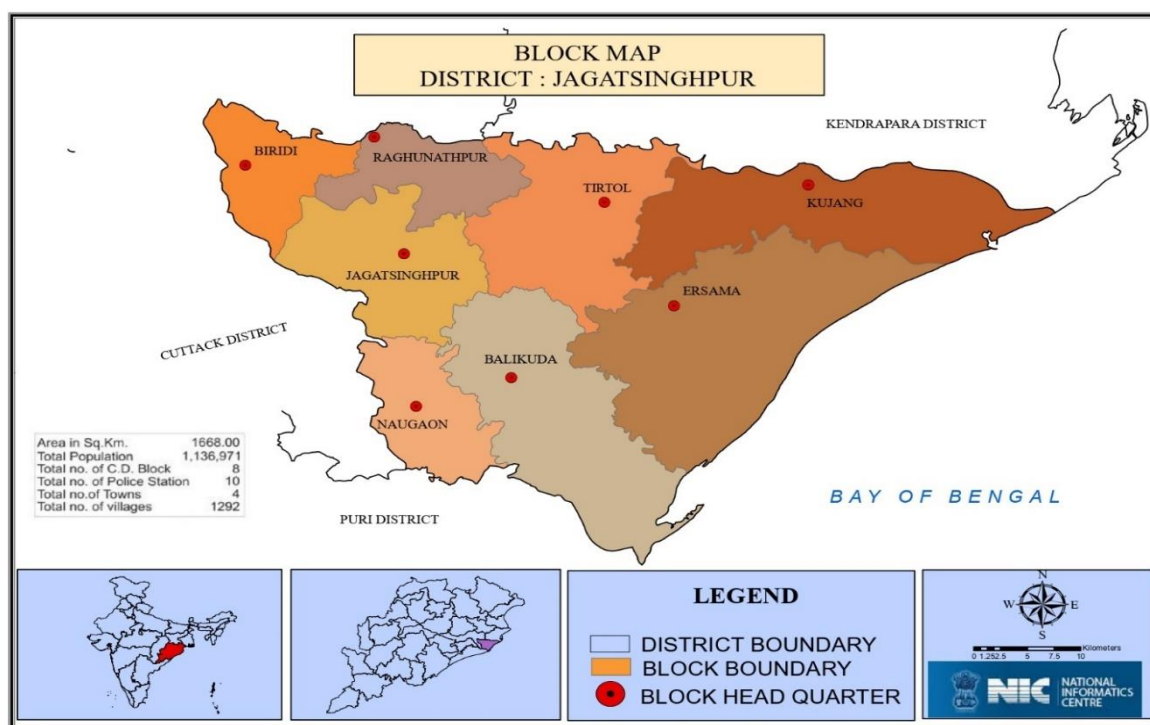
The percent of scheduled caste (SC) and scheduled tribe (ST) is 21.8 and 0.7 percent in the district. There are eight blocks, 194 gram panchayats, and 1292 villages in Jagatsinghpur (Census, 2011). Agriculture and fishing are the primary sources of income for the inhabitants in this district because it is located on the Mahanadi Delta. Due to the cyclone and natural calamities, the district faces huge losses every year. The super cyclone of 1999, cyclone Phailin 2013, Hudhud 2014, Fani 2019, Yaas, and Jawad 2021 that hit the Odisha coast greatly damaged this district.

The economy of Jagatsinghpur is primarily dependent on agriculture and fisheries. The district has a large coastal belt, which is rich in marine resources like fish, prawns, and crabs. The region is also known for its salt production, and the district has several salt pans along the coast. The district is known for its paddy cultivation, and the region produces a large quantity of rice yearly.

### **Profile of Study Villages**

Erasama block's population is 106,896, of which 53,557 are male and 53,339 females. The average literacy rate is 84.4 percent, and the sex ratio is 928. The primary workers are 29,252, of which males are 24,705 and females are 4,547. The total number of cultivators are 15,324 and agriculture labourer are 6,532, and the marginal worker is 14,759; household industries are 827, and the remaining 62,885 belongs to non-working (Census Handbook, 2011). The study was conducted in two villages, Dinkia and Ersama, of Jagatsinghpur district.

**Figure No 1.1: Geographical Location of Ersama Block**



Source- Odisha Geo Portal, <https://gisodisha.nic.in/>

## Scope of the Study

The universe of the study is Jagatsinghpur, Odisha. Jagatsinghpur has become the first district in Odisha to implement e-Office from district collectorate to gram panchayat. On January 31, 2020, the Collectorate of Jagatsinghpur, Odisha, adopted the e-Office product (the online office automation application) from the National Informatics Centre in Bhubaneswar to facilitate district administration, intra-government processes and to deliver IT-enabled e-governance that is simplified, responsive, effective, and transparent.

The state also introduced ICTs based initiatives across the district to communicate all office related work online. Now, the entire district network, which includes more than 700 users in 29 sections under collectorate administration, as well as around 40 numbers of other offices located throughout the district, such as subdivisions, municipalities, district rural development agency (DRDA), road transport authority (RTO), sub-registrars, blocks, and tehsils have been brought into the e-Office folder (Informatics, 2020)

## **Field Site**

Fieldwork was carried out in the select two villages of Erasama Block. They are Dinkia and Ersama. Data were collected during October-February 2019 and September-January 2020. Prior to the actual data collection exercise, the researcher conducted a pilot field study in December-January 2018. The data collection methods include in-depth unstructured interviews, focus group discussions, etc. with the respondents belonging to the two villages. The respondents include individuals of the two villages, village level entrepreneurs, public distribution system dealer, self-help group members (SHGs), network administrators of the Odisha government - NIC and OSWAN officials.

Fieldwork focussed on state social welfare schemes and ICTs-led e-governance programmes such as PDS, MGNREGA, and pension. Data has been analysed to understand better the dynamics at play between the state and its citizens in various programmes and how technology mediates welfare services.

The CSC centres, PDS fair price shop, offices of the panchayat and block have been visited to understand the day-to-day operations of government-sponsored welfare programmes such as PDS, MGNREGA, and pension schemes, using ICTs interface by the functionaries as well as people. Fieldwork was undertaken at the village level with women and elderly respondents who were assumed to know more about the changing nature of state welfare efforts on communities and the state-citizen interaction. PDS/FPS retailers, SHGs, political representatives, business people doing transactions through UPI and QR scanners, CSC centres, and government officials were interviewed during the fieldwork.

Beneficiaries were largely interacted through focus group discussions and personal interviews. Apart from the beneficiaries, Key Informants were identified during the fieldwork and were interviewed to know about the ICTs initiatives in the village and the related operational aspects. Interviews are also conducted with district-level officials, block-level officials, Village Level entrepreneurs (VLE), PDS dealers/Fair Price Shop owners and local political representatives.

## **Structure of the Thesis**

This thesis is structured into six chapters. Chapter one introduces the concept of ICTs, their increasing role in governance, the evolution of e-governance in India, and also provides the background for the study. It also explicates the methodology adopted in data collection and

introduces the field site. It outlines the objectives of the study and the specific research questions explored in the study. The profile of the study area is also presented in the chapter.

Sociological assessment of ICTs in governance has been the main focus of chapter two, and this chapter presents the review of the literature and the thematic analysis of relevant literature. It summarises the conceptual and theoretical underpinnings of the study from the perspective of science, technology and society (STS). Further it delineates the two major streams in the field of STS i.e., social determinism and the social construction of technology.

Chapter three argues that ICTs is a socio-technical paradigm through policy and practice. The focus is on the interplay between social and technical elements in the design, implementation, and use of ICTs, and the integration of policy and practice which becomes crucial for effectively harnessing the potential of ICTs. The chapter reviews the data on ICTs and the status of e-governance beneficiaries and telecommunication subscribers in India. It also analyses the role of ICTs in governance and the day-to-day life of citizens. It mainly focuses on common service centres providing e-governance services in rural areas and also examines the telecommunication services in India and its historical paradigm.

Chapter four explains the social construction of e-governance in rural Odisha, India, including the perceptions, impacts, and inequalities associated with implementing electronic governance initiatives based on the empirical data. The socio-economic profile of the respondents is presented in this chapter. This chapter also explores the social construction of e-governance in rural Odisha and includes how individuals and communities perceive and interpret these initiatives. The fifth chapter discusses the findings and places the discussion in a sociology of ICTs framework. Chapter six concludes the study findings in the light of empirical findings and the existing sociological literature on ICTs in general and rural India in particular. The thesis explores the intricate social and cultural aspects, the state-citizen relationship, and the social appropriation of technology in rural areas. It contextualizes the debate on digital inequality in the form of the digital divide and how the rural citizens are using the ICTs led e-governance initiatives.

## **CHAPTER 2**

### **ICTs IN GOVERNANCE: A SOCIOLOGICAL APPRAISAL**

State, science and society are deeply interrelated in a complex and dynamic relationship. State is the primary institution responsible for creating and enforcing laws, policies and regulations; science is the systematic study of the physical and natural world; and society is the collective set of individuals and institutions that make up a particular culture or geographic area. State, science and society interact in a number of ways. For example, state relies on scientific research to inform its decision-making; science is heavily funded by state, which also sets the parameters of what is permissible; and society is shaped by the laws, policies, and regulations established by state.

A sociological understanding of science explores the interface between science and society. Often state mediates such interaction, and in the field of ICTs state has been the dominant player as far as taking the fruits of science to its citizens is concerned. The present chapter critically explores the sociology of ICTs and governance in India in general and in Odisha in particular. It is divided into three sections. The first section focuses on science, technology and society interface from a sociological perspective. The second section lays emphasis on ICTs highlighting the theoretical underpinnings of ICTs in governance. The third section critically examines the literature on empirical analysis of ICTs and governance.

#### **Sociology of Science**

Sociology of science is a subfield of sociology that studies social aspects of science and technology, including the relationships between science, technology and society. It examines how scientific and technological knowledge is produced, distributed and used, and how it impacts various social groups and institutions. Sociology of science is interdisciplinary in nature and draws on ideas and theories from sociology, history, philosophy and anthropology, among other disciplines. It studies the relationship between power and knowledge, explores the politics of knowledge and examines the ways in which scientific knowledge is used to shape and influence public opinion, policy and decision-making. In addition, the field examines the ways that gender, race, class and other social categories shape scientific knowledge and practice.

Sociology of science explores the social and cultural factors that shape scientific research and the production of scientific knowledge. As a field, it is concerned with understanding how

scientific communities function, how scientific ideas are developed and disseminated, and how science is influenced by social and cultural contexts. One key theme in the sociology of science literature is the idea that scientific knowledge is not purely objective or value-free. It is instead shaped by social and cultural factors. This perspective is reflected in the works of Thomas Kuhn, who argued that scientific knowledge is constructed within paradigms or frameworks that are shaped by social and cultural factors (Kuhn, 1962; 2012, Edge et al., 1997).

Science is a cultural tradition passed down from generations because of its intrinsic value and numerous practical uses in modern society (Ben-David & Sullivan, 1975). The sociology of science is an inquiry into the nature and limits of particular knowledge. Sociology of science critically examines the locus of science in society. It seeks to comprehend the social elements of science. It examines the social contexts, outcomes and mechanisms of scientific inquiry (Bucchi, 2004).

Scholars in the field of sociology of science, like Mulkay (1980; 2014); Latour (1987), Barnes and Edge, (1982), (Zuckerman, 1988) etc., provide an overview of sociology of science, exploring its history, major themes, and analytical techniques. The scholarship provides an overview of the history of sociology of science. These scholars also identify the main themes of sociology of science, including the role of values, power and social networks in scientific knowledge production and evaluation. They also examine the role of scientific models in understanding the connection between science and society and the implications of these models for social change (Callon et al., 1986).

Sociology of science studies the creation and consumption of scientific knowledge in various cultural contexts, institutional structures, local organisations and immediate surroundings. Early research in sociology of science examined the social structure of science in which scientists operate. What rules control science? Who evaluates and rewards scientists? How are scientific networks organised? Merton's 'norms of science' is an important contribution in this regard (Merton, 1973).

Thomas Kuhn's idea of the 'structure of scientific revolutions' proposed a new and revolutionary way of looking at the development of scientific knowledge. Kuhn argues that science and scientific knowledge do not simply accumulate through a process of gradual accumulation but rather that science goes through periods of 'paradigm shifts' in which the dominant worldview is overturned and replaced by a new worldview. He argues that these paradigm shifts are accompanied by a period of intense debate, controversy and re-evaluation

of existing scientific theories. Kuhn's theories of scientific revolutions and paradigm shifts have profoundly influenced sociology of science and philosophy of science and continue to shape the way scientists and historians think about the development of science (Kuhn, 1962).

According to Kuhn, the internal world of science is 'concerned with the substance of science as knowledge', whereas the external world of science is 'the activity of scientists as a social group within a larger culture' (Kuhn, 1968). Merton is credited with the distinction of identifying science as a social institution. Merton's thesis examines how social needs affect, determine and govern scientific research. He founded the field of sociology of science and he used 17<sup>th</sup> century England's industrial revolution as an example. He looked at how social needs led to scientific research and technical innovations under the influence of Baconian reasoning, inductive reasoning, and scientific experimentation (Merton, 1942). Merton believes that science is the best way to understand the world and that its discoveries should be used for the betterment of lives of people. He also encourages collaboration and open dialogue between scientists, engineers and the public in order to ensure that scientific knowledge is accessible and shared. He believes that science should be conducted with integrity and objectivity and that its results should be shared openly and honestly.

### **Merton's Ethos of Science**

Merton identifies four scientific norms which are observed involuntarily in all fields of sciences, the values and ethos which bind the scientific community and evolve into a distinct social institution called 'science.' They are communism, universalism, disinterestedness, and organised skepticism, often called as CUDOs.

Communism suggests that scientific knowledge is shared and discussed openly with others in the scientific community. Universalism holds that scientific knowledge is open to all, regardless of class, race or gender. Disinterestedness is the idea that scientists are motivated by a desire for knowledge and truth rather than personal gain or external rewards. Organised skepticism demands that scientists should question and critique theories and evidence, and use evidence to support or refute claims (Merton, 1942).

'Science in Action', by Bruno Latour, is an important work of sociological study which explores the relationships between science, technology and society. Latour refutes the idea that science is an autonomous, self-contained enterprise, and demonstrates the inextricable links between science and society. Latour delineates how scientific knowledge is produced, and how

it is used and applied in the real world. He looks at the influence of politics, economics, and culture on the scientific process, and how science shapes our lives in a variety of ways (Latour, 1987).

### **Science, Technology and Society (STS)**

Technology is the medium through which human beings interact with nature. Science is an ideology, inquiry, an institution and a method. Science teaches how to move to the world of unknowns to known, how to question or interrogate structure and sub structure of knowledge.

Science technology and society is a field of study which focuses on the relationship between science, technology and society. In the early 1960s, in the wake of the civil rights, anti-war, ecological and feminist movements, a new kind of sociology of science emerged and many sociologists have started to focus on science studies, science and technology studies, social studies of science, science technology and society studies (Merton, 1968).

STS is a subfield within sociology that lays emphasis on the social aspects of science and technology. It examines the ways science and technology shape and are shaped by social and cultural factors, and how they impact individuals, communities, and society as a whole. STS scholars analyse the influence of scientific ideas and technological innovations on people's lives and the environment, exploring how these changes shape the world.

The major focus of STS is to understand how scientific and technological advances are shaped by the political, economic and social systems in which they are embedded. STS research also looks at the ethics and values that inform or are created by scientific and technological progress. It inquiries into how science and technology are used to shape social values, norms and beliefs, and how these values, norms and beliefs shape the progress of science and technology. It examines the implications of new and emerging technologies on society and the ethical and policy considerations related to the deployment of new and emerging technologies.

Haribabu (1991), an important scholar in the field of sociology of science and technology in India, explains that the sociology of science is a field of inquiry that examines the social aspects of scientific knowledge and its production. It focuses on how the political, social and economic context in which scientific information is generated affects that knowledge. According to him the sociology of science also considers the impact of science on society and vice versa. He argues that science is embedded in culture and that the sociological study of scientific knowledge is necessary to understand how science works and how it affects society. He also

argues that science is not neutral but rather reflects the values and interests of those who produce it.

Mallick (2005) observes that sociology of science focuses on how and to what extent both internal and external socio-cultural elements impact and shape scientific and technical development. V. V. Krishna, another prominent scholar of STS in India observes that enquiry about the social history of contemporary science, in particular the process by which science gained social legitimacy, provides an insightful overview of the interactions between science and society as they have developed from the time of Galileo. According to Krishna, science is a powerful, influential, and desired social institution. For the past three centuries, science has valued knowledge as a public benefit, peer review, open publications, scientific autonomy, and professional recognition. This culture of scientific inquiry has fostered a unique social contract between science and society during the past sixty years (Krishna, 2014).

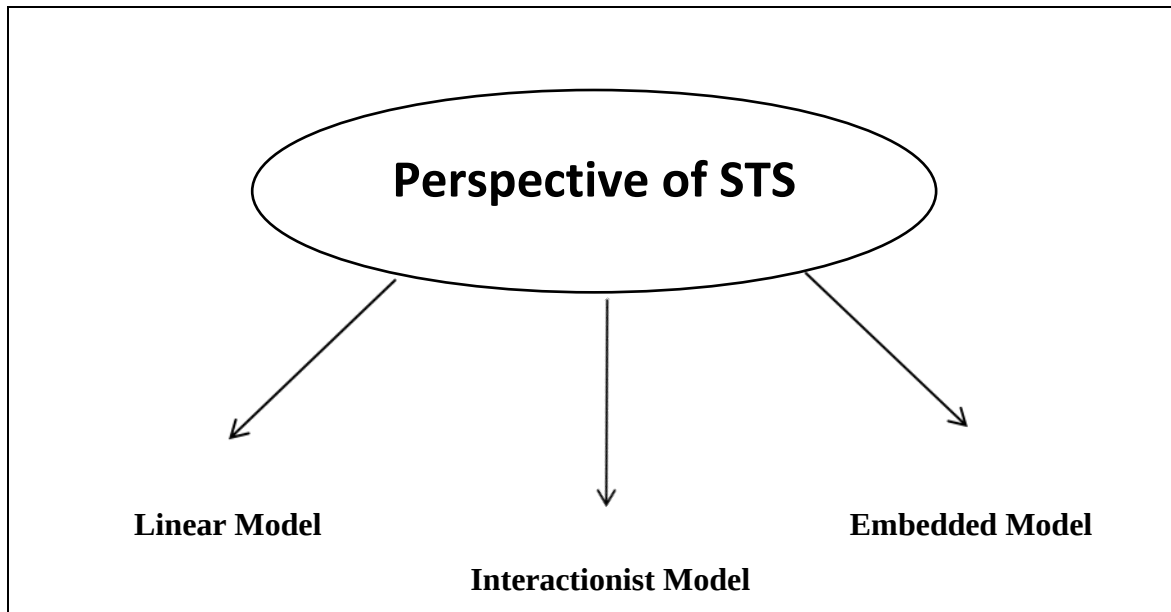
### **Perspectives on Science Technology and Society**

Perspectives on STS explore the complex relationships between science, technology and society. They examine the ways in which scientific and technological developments are shaped by social, political, cultural and economic factors, and how they, in turn, influence society.

STS offers a unique perspective on the world, one that incorporates both scientific and social elements. It provides different ways of understanding the relationships between science, technology and society, and can be used in combination to provide a more comprehensive and nuanced understanding of these relationships. STS research explores the ways in which technology and science interact with and shape our everyday lives. It provides an important perspective for understanding current and future trends in technology and for making decisions about how to use technology responsibly and in ways that benefit society as a whole.

Science and technology is seen as a force for 'social good'. The scholars who adopt this perspective point at the improvements in healthcare, education, transportation and telecommunication as evidence of the positive impact of science and technology. They often view science as a tool that can be used to improve people's lives. On the other hand, those who are more sceptical of science and technology believe that it carries with it the potential for risk. They point to the potential for abuse of power, the exploitation of resources, and the risk of catastrophic accidents. They also express the concern about the role of technology in perpetuating existing inequalities.

**Figure No 2.1: Perspective of STS**



Source: (Merton, 1942)

**Linear Model:** In the linear model, scientific research comes out with basic knowledge which is applied as technology in fulfilling the needs of society. It suggests one way relationship.

**Interactionist Model:** It suggests a linear model; however, it also argues that society is not just a passive receiver of science and technology but also influences them in turn. Thus, it suggests a two-way relationship.

**Embedded Model:** According to this model, the relationship is symbiotic. The use of embedded models in STS provides a powerful tool for exploring and understanding the complex interplay between science, technology and society, and for making predictions about their future evolution.

Callon (1986) discusses how science and technology are changing the way people interact with and understand the world, and how these changes are affecting the way people think and act. He argues that the new forms of knowledge and communication created by science and technology have altered the traditional patterns of social interaction. He suggests that new forms of knowledge and communication increasingly challenge traditional social structures, and these changes have positive and negative implications for society. Callon also investigates how advances in science and technology have influenced how people think and act and how these changes may affect the future of science and technology.

Sismondo (2018) outlines the historical development of STS and its connection to other fields of inquiry, such as sociology and philosophy. He also discusses the various subfields within STS, including the sociology of scientific knowledge, the philosophy of science, the history and sociology of technology, and the politics of science. In addition, he examines the various research methods used in STS, from qualitative methods, and provides an overview of the practical applications of STS in areas such as policy analysis and public engagement. He explores the implications of STS for understanding and addressing contemporary issues related to science and technology, such as climate change and biotechnology (Sismondo, 2018).

### **Technological Determinism**

Technological determinism is a concept that has been discussed in various fields of study, including sociology, media studies and philosophy. The concept has been explored in literature for decades, beginning with the work of French theorist Jacques Ellul in the 1950s. Ellul argued that technology had an autonomous force that could shape social and cultural development, and his work set the foundation for much of the literature on technological determinism (Elul, 2021)

Karl Marx is credited with postulating the intricate relationship between forces of production, technology, and production. Capitalist class interests revolve around increasing productivity and maximising profits. In the globalised world, the alliance between science and capitalists led to the advancement of those technologies, which further the interests of the capitalist class. Marxists argue that ICTs perpetuate the interests of the capitalist class and do very little for the poor working class. According to Marxists, organisational structure, human social relations, and cultural practices revolve around the technical and economic base. This technological deterministic stand, when extended to emerging technologies, points to the increasing role of technology in altering society and human lives. But we cannot presume that technology is shaping and forming a new civilization (Smith & Marx, 1992; Marx & Simon, 1994).

In 1960s, American sociologist Langdon Winner developed the concept of technological determinism in his work “Autonomous Technology: Technics out of control” as a theme in political thought. He argued that technology had an inherent logic and force that shaped social and political outcomes, and his work served as a major influence on subsequent literature (Winner, 1978). Winner’s theory of technological determinism proposes that technology is the primary driving force behind cultural and social change. He argues that technological advancements shape society and culture, rather than society and culture shaping technological

advancements. Winner suggests that technology has an inherent power to shape human behavior and social structures, and that the impact of technology on society is largely determined by its design and implementation. According to Winner, the choices made in the design of a technology, such as the features it includes, the materials it uses, and the way it is marketed, can have profound social and political consequences. He articulates that technological advancements are not inevitable, but are the result of deliberate choices made by individuals and institutions. He suggests that those who control the design and implementation of technology also hold power over society, and that it is important for individuals and communities to be aware of these power dynamics. Winner's theory of technological determinism emphasises the status of considering the political and social implications of technological advancements and encourages individuals and communities to take an active role in shaping the direction of technology (Winner, 1978; 1993).

In the 1970s, British Sociologist Marshall McLuhan in his seminal work "Understanding media: The extension of man", suggested that technology had a pervasive influence on culture and argued that its effects could not be easily undone. His work had a major impact on the development of technological determinism literature (McLuhan, 1994). McLuhan is widely regarded as one of the most influential advocates of the concept of technological determinism. He emphasised that society and individuals are under the influence of various technical advancements, which in turn affect culture. He predicted the future of technology even before the development of current information technology, such as computers and the internet, demonstrates, which signifies the importance of his work. The most important of his points, which have been developed further, are:

- Medium is the message
- The medium always leads to another medium
- Technologies and media have become an extension of the human body

According to McLuhan, there are four stages of media development, namely, oral culture, literate culture, print culture, and digital media or electronic media. In light of this, we can confidently say that technical advancement has been moving the human race forward, and that we are currently at exponential technological growth. Because of the rise in interconnection, the world now appears smaller than ever before.

In the 1980s, American media theorist Neil Postman explored the concept of technological determinism in his book "Technopoly: The surrender of culture of technology". Postman

argued that technology had an inevitable and all-encompassing effect on society, and that was leading to the ‘dehumanisation’ of culture. His work has been widely cited in subsequent literature on technological determinism (Postman, 2011).

In the 1990s, American sociologist and philosopher Andrew Feenberg developed the concept of critical technological determinism in his book “Critical Theory of Technology”. Feenberg argued that technology did not have an autonomous force but rather was shaped by the values and interests of those who created and used it. His work has been influential in the literature on technological determinism (Feenberg, 1991).

In the 2000s, British philosopher of technology Donna Haraway wrote extensively about the concept of technological determinism in her work “The Cyborg Manifesto”. Haraway argued that technology had a major influence on humanity, and that it was creating a ‘posthuman’ future. Overall, technological determinism has been discussed in literature for decades, and the concept has been explored in detail by many authors and theorists. Winner, McLuhan, Postman, Feenberg and Haraway are some of the major theorists who have contributed to the literature on technological determinism, and their work has been hugely influential in shaping the current understanding of the concept.

### **Social Construction of Technology**

According to the social construction of technology perspective (SCOT), technology is not determined by its inherent technical properties or by the needs of users, but rather emerges through a complex process of negotiation and interpretation among various stakeholders, including designers, engineers, users, and other actors. The meaning and significance of technology are also socially constructed, as they are shaped by the context in which it is used, the cultural beliefs and practices of the users, and the broader social and political structures that shape technological development.

SCOT approach highlights the influence of social and cultural factors such as politics, economics, and ideology on the development of technology. This approach argues that technology is not simply a reflection of society, but it is also a source of social change and its design, development, and use are influenced by the values and interests of various social groups (Pinch & Bijker, 1984; Bijker & Law, 1994). The SCOT approach has been applied to a wide range of technologies, including information and communication technologies, biotechnology, and energy systems. It has been used to study the social and cultural factors that influence the

design, development, and use of these technologies, as well as the impacts that these technologies have on society.

In the field of STS, SCOT has become a popular approach in understanding how technology is developed and used. It has been employed in various disciplines, including history, sociology, anthropology, and philosophy. SCOT-based studies have investigated the involvement of many stakeholders in the development and application of technology, the power dynamics between actors, and the implications of different designs and technologies on society. This perspective has also been used to investigate the ways in which technology is used to reinforce or challenge existing social structures and the implications of the historical construction of technology on contemporary practices (MacKenzie & Wajcman, 1999).

SCOT approach was developed by the British sociologist Wiebe Bijker, Thomas P. Hughes, Trevor Pinch and other scholars, in the 1980s. Bijker's work on "Of bicycles, Bakelites and bulbs: Towards a theory of socio-technical change" is an exploration of the concept of sociotechnical change. The scholars explicate the idea of how technology shapes society and how society shapes technology. They examine how the development of bicycle, Bakelite, and the electric bulb have altered society in different ways. Their scholarly work is an important one in the field of sociotechnical change and provides a valuable insight into the complex relationships between technology and society (Bijker, 1997).

Pinch & Bijker (1984) describe the development of technology as a result of a complex interplay between social and technical factors. SCOT argues that technology is not a predetermined outcome and instead is shaped by the various actors involved in its development, including users, producers and the social context in which it is embedded. SCOT further argues that technology can result from collective action and negotiation between different actors. By understanding the social, economic, institutional and political contexts in which technology is embedded, SCOT provides an important means for understanding the development and adoption of technology.

The proponents of SCOT, Pinch & Bijker (2012) contend that both science and technology are shaped by social and cultural factors, such as politics, economics, and ideology, and that the production of knowledge and artifacts is influenced by the values and interests of various social groups. They view science and technology as socially constructed entities implying that the knowledge produced by science and the artifacts produced by technology are not simply the result of technical or scientific progress, but are shaped by social and cultural processes. In

their proposition on SCOT, Pinch & Bijker use example of bicycle to explain how the design and development of the bicycle was influenced by social and cultural factors. The case of bicycle demonstrates the importance of considering the social and cultural dimensions of technology and highlights the insights that can be gained by using the social constructivist approach.

The SCOT approach had a significant impact, and is widely regarded as a classic work in the field of science, technology and society. It has inspired a rich tradition of research that explores the social and cultural dimensions of science and technology, and has helped to establish the social constructivist approach as a valuable perspective for understanding the relationship between science and technology and society.

### **The Network Society**

The network society theory was developed by sociologist Manuel Castells. He suggests that contemporary society is characterised by the emergence of a new social structure based on the pervasive use of networked communication technologies. This new structure is composed of global networks of information and communication that transcend traditional geographical, political, and cultural boundaries, and that enable the formation of new forms of social organisation, identity, and power. Castells argues that this transformation has profound implications for the way we live, work, and interact with one another, and that it poses both opportunities and challenges for individuals and societies (Castells, 2000).

According to Castells, the network society is characterised by a shift from traditional, hierarchical social structures to more fluid, decentralised ones. This is largely due to the rise of digital technologies that allow for the easy exchange of information and communication across vast distances. As a result, individuals and groups are able to connect and collaborate in new ways, leading to the emergence of social and economic organisation.

It is characterised by the increased interdependence and interconnectivity of individuals, organisations, and resources, enabled by digital communication technologies. It is an evolving concept which has become increasingly relevant in the emergence of the social media, and mobile devices. It is associated with concepts such as information society, knowledge economy and virtual communities.

It is characterised by the increased interdependence of individuals and organisations through the use of ICTs. This interdependence has created a new type of networked society in which

individuals are no longer bound by geographical or social boundaries, but instead are connected through technological networks. In this new society, the power of individuals and organizations is determined by their ability to access and manipulate information. The Network Society has also created a new form of global economy, in which markets and individuals are connected and interdependent on a global level.

For Castells networks constitute the new social morphology of the contemporary societies. He believes that there is a radical disconnectedness in contemporary society bringing about a greater sense of autonomy due to technology. Castells observes that “we are passing from the industrial age into the information age” (Castells, 2011).

Castells' work provides an in-depth analysis of the emergence of network society and its impact of digital technology on the global economy, society and culture. Through the lens of critical sociology, Castells examines the changing nature of power, labour, capital, and the circulation of information in the age of the internet and digital technology. He argues that the emergence of the network society has fundamentally changed the way we interact with one another, linking people and businesses across the globe. He discusses how this shift led to the rise of new forms of power and control, along with new opportunities for economic growth and social transformation (Castells, 2002; 2011).

The network society of the future is an interconnected global community in which people can freely communicate and collaborate with one another, regardless of geographical location or cultural context. This type of society is enabled by advances in technology and the internet, which allow for convenient and instantaneous communication, sharing of information, and access to resources that span the entire world. In a network society, individuals have the power to access knowledge, connect with others, and create their own independent economic opportunities. Furthermore, it allows for a more equitable distribution of resources and opportunities, by connecting people from all walks of life to the same sources of information and opportunities. By connecting people from all over the world, it has the potential to break down cultural and societal barriers, allowing for more inclusive and equitable societies.

The sociology of network society is the study of the way in which the internet and other new technologies are changing the way humans interact with each other, how social relationships and communities are formed, and the impact that this has on our everyday lives. It looks at how networks are used to communicate, share information, and build social capital. It also looks at how networks are used to create new forms of power and influence, as well as to shape and

reinforce existing power structures. Network society also examines the impact of digital technology on identity, gender, race, and class. It explores the implications of networked society for democracy, everyday life, and the future of society.

In Castells' theory of network society, information is seen as a fundamental element in the functioning of societies and the production of knowledge. He argues that information is not only a means of communication but also a source of power and a key driver of social, economic, and cultural change. Castells emphasises the importance of understanding the dynamics of information flows in networked societies and the role of technology in shaping these flows. ICTs play a critical role in facilitating the flow of information in modern societies and enabling communication and interaction across networks. ICTs, particularly the emergence of digital networks, has transformed the way information is produced, distributed, and consumed. This transformation has had profound effects on various aspects of society, including the economy, politics, culture, and individual identities

### **Network Society and the Rise of Digital Networks**

The global financial markets best illustrate the growth of the network society. With developments in technology and network connectivity, the global financial system is more linked than ever. This connection has led to the rise of "exotic" financial products that hedge against all sorts of risk and the perpetuation of existing inequalities. The rise of the network society has affected global capitalism and made the media more powerful as a way to set agendas and shape public opinion (Castells, 2000).

Castells detects the emergence of a new type of capitalism, which he refers to as 'global informational capitalism' or 'informationalism'. This new type of capitalism is being driven by ICTs and the processing of information and knowledge via various technologies is one of the defining characteristics of this new system. Networks are an essential component of the new socioeconomic system, and they stand in for the guiding principles that govern society's organisational structure (Castells, 1996).

### **Sociology of Information and Communication Technologies**

ICTs have been playing a vital role in the contemporary society. The growth of ICTs, their applications and the adoption of ICTs based services by the human agency is of greater concern to the sociologists. Growing adoption of ICTs based services related to government services, market linked services, health care services, educational services, etc. has been the hallmark of

the contemporary civil society. Cutting across rural-urban, gender, class and age divisions ICTs has become inseparable part of everyday life.

The sociology of ICTs studies how ICTs i.e., the internet, mobile phones, and social media shape social interactions, identities, and organisations. In particular, sociologists have been critically examining how ICTs affect communication, collaboration, identity formation, power dynamics, and societal structures. Sociology scholars are more interested in understanding the differential impact of ICTs on vulnerable populations, such as individuals living in poverty or those living in rural areas.

Roztocki, et al. (2019) discuss how ICTs is transforming the way people live, work, and communicate and how it is impacting the economy and other aspects of our lives. They also provide insights into the challenges and opportunities associated with ICTs use, as well as potential solutions to ensure that the technology is used responsibly and efficiently.

As new information and communication technologies are developed, their technical characteristics increasingly predominate in explanations of change and development in the modern era. Both the technical characteristics and standards of the software and hardware, as well as the actual societal structures are embedded in the structure of digital networks (Sassen, 2002). The development of ICTs, as well as the proliferation of the internet, has created new possibilities for the transformation of the relationship between governments and their constituents, as well as between governments and businesses. These new possibilities are essential to the achievement of good governance. They make it possible for individuals and businesses to participate in the decision-making process at all levels of government by offering these chances. They make it easier to provide better service to customers, both in terms of timeliness and the quality of the service, for effective and efficient governance.

In studying the sociology of information technology, scholars analyse various aspects, including the social impacts of technology adoption, the digital divide, social inequalities in access to technology, the transformation of work and labour, the formation of virtual communities and online identities, and the privacy and surveillance concerns associated with digital technologies.

In the article “Towards a Sociology of Information Technology” Sassen (2002) explores the social implications of information technology and its role in shaping contemporary societies. Sassen examines how information technology is intertwined with power structures and control

mechanisms. She investigates how technology can be used by governments, corporations, and other actors to exert control over individuals, communities, and societies. This includes discussions on surveillance, privacy concerns, and the potential for technology to amplify existing inequalities.

David Lyon is a prominent sociologist known for his research on surveillance studies and the social implications of digital technologies. He has extensively researched and written about surveillance and its impact on society. His work focuses on the intersection of technology, social control and privacy. He has explored how the proliferation of digital technologies, such as surveillance cameras, data collection, and social media, affects power dynamics, privacy rights, and social relationships (Lyon, 2007). Lyon's work on surveillance studies intersects with the digital divide, as access to technology and digital resources can also influence individuals' vulnerability to surveillance and data privacy concerns. His research explores the ways in which unequal access to technology shapes power relationships and surveillance practices within society.

The digital divide refers to the gap between individuals or groups with access to and effectively using digital technologies and those without. It encompasses disparities in access to the internet, digital literacy skills, and the availability of technological resources. The digital divide often exacerbates existing social inequalities, as it can limit opportunities for education, health, and access to information (Dijk, 2020).

Barry Wellman and Caroline Haythornthwaite's book, "Internet society: The internet in everyday life," is an in-depth exploration of how the internet is changing our lives, from the way we communicate to the way we shop, to the way we think. The book explores the impact of the internet on individuals, communities, and society at large. They examine the implications of a connected world, including how the internet changes our social relationships, political and economic systems, and cultural identities. They also consider how the internet affects our values, beliefs, and behaviors and how it has transformed how we work and play. With an eye to the future, they look at the potential of the internet to reshape our lives in ways that we have not anticipated. This book provides an insightful look at how the internet transforms our lives and world (Bakardjieva, 2005; Wellman & Haythornthwaite, 2002).

Chaudhuri (2021) explored the relationship between the state and citizens using the analytical lens and the methodological approach of adopting the state in the theoretical perspective of 'seeing the state' and 'anthropology of state' to understand the digital identity and working of

Aadhaar in Jharkhand, India. She concluded her paper by highlighting digital identity systems, such as Aadhaar, and how they shape the state and citizen relationship.

### **ICTs and Digital Divide**

ICTs has transformed the way people communicate, access information, and conduct business. While ICTs has the potential to create a more connected and equitable world, they have also created new forms of inequality. The digital divide refers to the gap between those who have access to ICTs and those who do not. ICTs has transformed the way we live, work and communicate; however, their benefits have not been distributed equally, resulting in what is known as the digital divide. This divide is particularly evident in developing countries, rural areas and among marginalised groups.

Digital divide refers to the gap between groups, or communities who have access to digital technologies and those who do not. This divide is widening between the “haves” and “have nots” of our globalised world. The unequal access to technology and the internet has been seen as a major factor in deepening the existing inequalities of power, wealth, and socio-economic status between rich and poor nations, as well as between different social classes. The digital divide can have significant impacts on society, exacerbating existing inequalities and hindering economic development.

From a sociological perspective, the digital divide is a manifestation of broader social inequalities. Sociologists argue that access to and use of ICTs is shaped by social, economic and political factors. For instance, people from affluent backgrounds are more likely to have better access to ICTs compared to those from poor backgrounds. Similarly, people who live in urban areas have greater access to ICTs compared to those in rural areas (Norris, 2001, Selwyn, 2003, 2004).

Furthermore, sociologists argue that the digital divide is about access to technology and the ability to use it effectively. This includes factors such as digital literacy, which refers to the skills and knowledge required to use ICTs. The digital divide has implications for social and economic outcomes. For example, access to ICTs is associated with higher levels of education, income, and employment, and individuals who lack access to ICTs may be excluded from these opportunities, leading to further social and economic inequality (Van Dijk, 2013).

There are several ways in which the digital divide can be addressed. One approach is to increase access to ICTs, particularly in marginalised areas. This includes initiatives such as providing

internet connectivity and affordable devices. Another approach is to improve digital literacy, by providing training and education to individuals and communities. Additionally, policies can be implemented to promote equity in the distribution of ICTs and ensure that marginalised groups are not left behind, especially in rural areas.

The digital divide is a complex social phenomenon that requires a comprehensive sociological analysis. It is important to understand the social, economic and political factors that shape access to and use of ICTs. Moreover, addressing the digital divide requires a multifaceted approach that includes increasing access to technology, improving digital literacy, and promoting equity in the distribution of ICTs.

India is a country where the digital divide is a significant issue. Although India has made significant progress in the field of ICTs over the past few decades, access to technology and internet connectivity is still limited in many parts of the country. The digital divide is particularly evident in rural areas, where access to ICTs is limited due to inadequate infrastructure, low levels of digital literacy, and limited availability of resources.

One of the main challenges in addressing the digital divide in India is the lack of access to technology while urban areas have relatively good internet connectivity, rural areas still lack basic infrastructure such as electricity and internet connectivity. This has resulted in a significant gap in access to technology between urban and rural areas. Another challenge is the low levels of digital literacy in India. While access to technology is essential, it is equally important to have the skills and knowledge required to use ICTs effectively. In India, many people lack basic digital literacy skills, which limits their ability to access the benefits of technology.

DiMaggio and Hargittai (2001) explore how the digital divide has evolved over time and argues that it is more useful to examine digital inequality as a continuum rather than a binary divide and they expressed in their work “‘digital divide’ to ‘digital inequality’: Studying internet use as penetration increases”. They argue that although the internet has provided a pathway for increased access to information and services, inadequate access to internet leads to digital divide.

Warschauer (2003) examines the issue of digital divide and its implications for social inclusion. He takes an interdisciplinary approach to the subject, drawing from economics, sociology, communications, and education to gain a fuller understanding of the issue. Warschauer explores how the proliferation of technology has impacted the way people interact, how

technological advancements have widened the gap between those with access to technology and those without, and how digital divide can be bridged. In addition, he examines how digital literacy, digital content, and innovative applications can be used to foster social inclusion. Warschauer provides critical analysis and thoughtful insight into the complexities of the digital divide and its implications for society.

Van Dijk (2005) argues that the social and cultural norms that govern technology use are often shaped by broader societal values and inequalities. For example, the digital divide may be reinforced by social and cultural norms that prioritize certain forms of knowledge or ways of learning over others. Through a comprehensive examination of the global information society, Van Dijk provides an in-depth analysis of how the digital divide is not only a barrier to access to technology, but also to a sense of belonging and identity. He examines the complex set of social, economic, and political factors that create and perpetuate inequality in the information society, offering a critical evaluation of current policies and suggesting strategies for bridging the gap.

The digital divide is often divided along gender, age, race, socio-economic status, location and region lines. Thakkar et al. (2022) studied the digital gender divide based on pre-pandemic survey data obtained in 2018 from 296 families in four underprivileged neighbourhoods of Thiruvananthapuram. Their research gives a general picture of the similarities and differences between women and men in the use of the internet, mobile phones, and social media. The study examines the perceived benefits and drawbacks of social media and smartphone usage, as well as their respective effects on both men and women.

## **E-Governance**

E-Governance uses digital technologies and the internet to improve public services and citizen participation in decision-making. It includes online government services, social media engagement, and data analytics to guide policy decisions. Some examples of e-governance services include social welfare schemes like PDS, Aadhaar, online application forms, and payment bills. E-governance also allows for real-time data exchange between citizens and the government, enabling a more informed decision-making process and reducing corruption. E-governance aims to create a seamless, integrated, and accessible government that can respond quickly and effectively to citizens' needs.

UNESCO describes “e-governance as the use of information and communication technology by the public sector to improve information and service delivery, encourage citizen

participation in decision-making, and make government more accountable, transparent, and efficient. E-governance is the use of ICTs by various social actors to enhance their access to information and strengthen their capacities” (UNESCO, 2005).

ICTs-led e-governance is increasingly seen as a pillar of a successful government modernisation and administration programme (Prabhu, 2013). The sociology of e-governance seeks to understand the social, cultural, and political implications of the use of technology in governance, and to explore how e-governance can be designed and implemented to promote greater democracy, accountability, and equality. It refers to the study of the social and cultural implications of the use of electronic communication technologies in government operations and decision-making. It examines how e-governance affects the relationship between citizens and the state, and how it changes the way that power and decision-making are exercised in society.

### **Sociology of E-Governance**

The sociology of e-governance is a theoretical framework that explores the social dimensions of the use of electronic technologies in governance. It seeks to understand how e-governance is shaping and being shaped by social relations, power dynamics, and institutional structures. One key aspect of the sociology of e-governance is the study of the social implications of e-governance. This includes examining the ways in which e-governance is changing relationships between citizens and the state, as well as between different actors within government. It also involves analysing how e-governance is affecting access to information and resources, and how it is impacting social inequalities and marginalised groups.

Another important area of research within the sociology of e-governance is the study of the organisational and institutional dynamics of e-governance. This includes looking at how e-governance systems are designed and implemented, and how they are integrated with existing bureaucratic structures and processes. It also involves examining the political and economic factors that shape the development of e-governance systems, as well as the role of stakeholders such as technology providers, civil society organisations, and international organisations.

Fox, Ward, and O’Rourke (2006) explore the intersection of technology, governance, and society. Fox, et al. argued that a comprehensive understanding of technology governance requires a sociological perspective that takes into account the broader social, economic, and political contexts in which technologies are developed, regulated, and utilized. As a result, the sociological approach to technology governance that goes beyond technical considerations and

incorporates a critical examination of power relations, social values, and societal impacts emphasize the importance of interdisciplinary collaboration between sociology, law, public health, and other relevant fields to develop robust governance frameworks.

### **Governmentality and Governance**

Foucault argues that governance operates through what he calls ‘governmentality,’ which encompasses a set of techniques and rationalities that shape and guide the conduct of individuals and societies. It involves the production of knowledge, the establishment of norms and standards, the creation of institutions and procedures, and the management of populations. Foucault’s concept of governance challenges the traditional understanding of power as a top-down imposition and highlights the ways in which power operates through various techniques, discourses, and practices (Madsen, 2014).

Foucault’s idea of governmentality has been used as a guide or source of ideas by a lot of social scientists. Even though he has not directly talked about the idea of governance as we talk about it now, a good analysis of his idea leads directly to the idea and concept of governance. In many of his works, Foucault has stated that it is hard to find the state in a concrete structure. Instead of being a thing, the state is made up of the things that people do (Rose, O’alley and Valverde, 2006).

Bourdieu’s (1984) ideas on governance are explained through his concept ‘field and habitus’. He focuses on social practices and how they are integrated inside the social structure. Giddens demonstrates that rather than viewing structure and agency from a binary perspective, it is constructive to observe simultaneously. Giddens maintains that structures impose on agency while, agency influences and creates structure. He argues that individuals have the capacity to act creatively and reflexively within social structures, and that this agency can be harnessed to transform existing structures and create new ones. However, he also acknowledges that agency is not equally distributed among individuals and that it is shaped by social inequalities and power relations. In terms of governance, Giddens emphasizes the importance of democratic accountability and participation. He argues that governance should be responsive to the needs and interests of citizens and that citizens should have the capacity to shape and influence governance through their participation and engagement (Giddens, 1986).

Giddens’ framework highlights the interplay between structure, agency and governance, and emphasizes the importance of understanding how these factors intersect and shape one another. It also underscores the need for democratic accountability and participation in governance, and

the potential for agency to transform social structures and governance practices (Giddens, 1986).

### **Empirical analysis of ICTs and Governance**

The sociological literature on ICTs in governance has largely focused on the ways in which ICTs has enabled governments, institutions, and organizations to carry out their functions more efficiently and effectively. Studies have examined how ICTs can help reduce bureaucracy, improve the delivery of public services, and increase the transparency of government processes.

The literature on the impact of ICTs on governance in India is mainly focused on three aspects: the impact of ICTs on public service delivery, the impact of ICTs on citizen engagement and participation, and the impact of ICTs on government transparency and accountability. Studies have shown that ICTs can improve public service delivery by streamlining the delivery process, reducing bureaucratic red tape, and increasing the efficiency of government processes. It can also help to increase citizen engagement and participation in governance. ICTs can help to make government accountable and transparent by providing access to information and data, and by enabling citizens to track the progress of government initiatives (Golding, 2000, Harindranath & Sen, 2004; Bhatnagar & Singh, 2010; Madon & Madon, 2009; Bertot, Jaeger & Grimes, 2010, Masiero,2019; Masiero & Prakash, 2020).

Carswell, et al., (2022) studied how biometric technologies, led by ICTs, are transforming the delivery of social welfare programs such as food subsidies and cash transfers in Tamil Nadu. The use of the biometric technologies has the potential to increase efficiency, reduce corruption, and improve targeting of benefits. However, there are also concerns about exclusion, privacy, and the role of intermediaries. Dutta and Pravakar (2007) provide an empirical assessment of the diffusion of ICTs and e-governance in India. The scholars analyse the diffusion of ICTs related services in the country from a historical perspective. They used quantitative and qualitative data from various sources such as interviews and surveys to assess the current status in India. Their study indicates that, despite the efforts of the government and private sector, the diffusion is still far from complete. They recommend that the government should focus on the expansion of ICTs infrastructure and its use by citizens, in order to promote ICTs in India.

Lee, et al., (2011) explore the effects of ICTs on public service delivery. The study investigated the effects of ICTs on public service delivery from the perspectives of citizens, public service

providers and policy makers. The study identified several potential benefits of ICTs enabled public service delivery, including improved efficiency and quality, increased satisfaction among citizens and public service providers, and improved access to public services and discuss the potential challenges and limitations of ICTs enabled public service delivery, such as inadequate infrastructure, lack of training and expertise, and privacy concerns.

Heeks (2005) examines the role of ICTs in developing-country governance. Heeks argues that ICTs can improve the effectiveness of government operations, reduce costs and enable better delivery of services. He also points out that ICTs may not be suitable for all contexts, and that their potential can only be realised with appropriate policy, capacity building and training, and the right institutional environment.

### **E-Governance initiatives in India**

E-Governance is an important initiative in India with the aim of providing better public services to citizens and improving the efficiency and effectiveness of government operations. This initiative has been gaining momentum since the early 2000s, when the government started to develop and implement various e-governance initiatives. This has led to a surge of research in the field of e-governance in India.

The first stage of the reform began in the 1980s with the participation of the private sector, and the second stage began in 1994 with the introduction of value-added services, basic phone service, and cellular phone service. The Telecom Regulatory Authority of India (TRAI) was initially founded in the year 1997 by the government of India. The third phase started in 1999 with the New Telecom Policy and the sanctioning of new commercial and public sector organisations like Bharat Sanchar Nigam Limited (BSNL) and Mahanagar Telephone Nigam Limited (MTNL), which are both state owned. This is how India has emerged as the market for telecommunications that is expanding at the quickest rate.

Digital India is a ‘flagship programme of the Government of India with a vision to transform India into a digitally empowered society and knowledge economy’. It seeks to bridge the rural-urban divide by providing people with access to digital services, resources, and information. It is aimed at making India a leader in the digital revolution and at creating an inclusive society by providing digital infrastructure, digital literacy, and digital empowerment. The program is divided into nine pillars: Digital Infrastructure, Digital Literacy, Digital Payments, Digital Services, Digital Security, Digital Empowerment, Digital India Platform, Digital Economy, Digital Stag and Digital Governance (<https://digitalindia.gov.in/>).

### **Jan-Dhan-Aadhaar-Mobile (JAM)**

JAM trinity is an initiative to use the combination of direct benefit transfer, Jan Dhan and Aadhaar to empower the poor. The key aim of JAM is to bring financial inclusion to the rural and unbanked population of India. It is a three-pronged strategy which focuses on providing access to financial services, Aadhaar enabled payment systems and mobile banking to the unbanked population. This initiative enables the government to directly transfer funds to the beneficiaries with minimum leakage and fraud. It will also help in better delivery of subsidies and government benefits.

### **Digital Technology and Public Distribution System**

The PDS is a food security system that provides subsidised food grains to the poor in India. The PDS was started in the 1940s to provide food security to the poor. There are three categories based on household and intensity of the poor i.e., Above Poverty Line (APL), Below Poverty Line (BPL) and AAY (Antyodaya Anna Yojana). For a long time, scholars have debated the issue of corruption in PDS, leakages and diversions. The necessity to combat corruption has definitely been a significant incentive for the recent change to technology.

Drèze has been a long-time critic of India's public distribution system and has written extensively on the subject. (Drèze & Khera, 2013; Khera, 2011). Drèze and Khera's work has focused on evaluating the effectiveness of the PDS in reaching its intended beneficiaries and identifying ways to improve its functioning. They have conducted extensive fieldwork and research on the ground to gather data and insights on how the PDS operates in different parts of the country. Their research has highlighted the importance of reforms in the PDS to address issues of leakages, inefficiencies, and corruption. They have advocated for measures such as increasing the number of fair price shops, improving the quality of food grains distributed, strengthening grievance redressal mechanisms, and ensuring better targeting of subsidies to reach the most vulnerable populations (Drèze & Khera, 2017; Khera, 2011).

Drèze (2017) has also been a strong advocate of using ICTs to improve the functioning of the PDS. He has argued that the use of technology, such as biometric authentication and digital tracking, can help reduce corruption and improve the delivery of subsidies to the intended beneficiaries. He has also been a proponent of using the PDS to address the issues of malnutrition and hunger in India. He has been involved in several initiatives aimed at

improving the PDS and promoting the use of ICTs in this regard. These initiatives have included pilot projects, research studies, and advocacy campaigns.

India's public distribution system (PDS), now, relies more on technology to improve PDS efficiency, transparency, and accountability. To integrate technology into the PDS, the Ministry of consumer affairs, food, and public distribution has taken steps like biometric authentication, digitisation, ration cards, and point of sales (POS) devices at the fair price shops which distribute foodgrains to the poor. The government is implementing Aadhar-based biometric authentication in all PDS shops. The biometric authentication system authenticates beneficiaries to avail rations, and checks for duplicates, and prevents fraud in the PDS. Digitising records and ration cards improve supply chain monitoring and decreases fraudulent cards. POS technology in PDS stores speed up transactions and decreases paperwork.

The government's e-PDS smartphone app enables users to find nearby PDS stores and check ration card status. This software can increase PDS access for citizens. The government is developing a computerised PDS payment mechanism. This system lets recipients pay for PDS purchases with UPI, debit and credit cards.

The transition to a public distribution system that Aadhaar facilitates is specifically targeted at eradicating corrupt activities, particularly those involving duplicate beneficiaries and so-called ghost beneficiaries (Hundal & Chaudhuri, 2020; Masiero & Prakash, 2015).

## **Conclusion**

The application of ICTs in governance is an important dimension of modern society, as it enhances the efficiency, transparency, and accountability of public administration. While the use of ICTs in governance has undoubtedly brought about positive changes, there are also some concerns that must be addressed, such as the digital divide, privacy and security issues, and the potential for exclusion of certain groups. The role of digital citizen in promoting transparency and accountability cannot be overemphasized, and their active participation in the governance process can help to ensure that the benefits of ICTs in governance are realised in a manner that is inclusive and equitable.

The sociological perspective on technology and e-governance highlights the social and institutional context in which e-governance systems are developed and implemented. It emphasizes the need to take a critical and reflexive approach to the use of technology in

governance and to recognize the ways in which technology can both reinforce and challenge existing power dynamics and social inequalities.

In recent years, one of the most important areas of research to focus on has been the sociology of ICTs and governance in India. Academicians have explored the implications of ICTs in different areas of governance, decentralisation, and citizen engagement, social inclusion, social transformation and the potential for ICTs to help improve service delivery, and the implications of ICTs for public and private sector cooperation.

The research on ICTs in governance finds that transparency is one of the key advantages of using digital technologies in social welfare services. By digitising the delivery of benefits, it becomes easier to track the flow of funds and prevent leakages. For example, biometric authentication can help to reduce fraud by ensuring that only eligible beneficiaries receive benefits. However, there are also concerns about exclusion. For example, some individuals may not have access to the necessary technology or may face difficulties in using it due to language or literacy barriers. There is also a risk that the use of digital technologies may exclude certain groups of people, such as those with disabilities or old who may have difficulty using biometric or digital devices. Another challenge is the role of intermediaries. The introduction of ICTs and the use of digital and biometric technologies can help to reduce the role of intermediaries, but it is important to ensure that the technology is designed in a way that minimizes their potential for abuse. It is important to address concerns about exclusion and the role of intermediaries to ensure that these technologies are used to benefit the deserving sections of society.

## **CHAPTER 3**

### **ICTs AS A SOCIO-TECHNICAL PARADIGM: POLICY AND PRACTICE**

Science and technology policies play a crucial role in shaping the direction and impact of scientific research and technological development. Science and technology policy and practices encompass a wide range of areas and processes that involve the development, use, and management of technology and science. They involve the formulation and implementation of policies and practices that are proposed to maximize the benefit of science and technology to society and to ensure that the benefits are spread equitably among all citizens.

India is perhaps the only emerging nation with a colonial history to have organised and formed a national science community well before it won its independence. This accomplishment occurred far before India gained its independence in 1947. The science and technology (S&T) strategy that was implemented by late Prime Minister Nehru during India's formative years has left a recognisable mark on India's post-colonial and post-independent state (Krishna, 2021).

#### **Evolution of Science, Technology and Innovation Policy**

The evolution of STI policy has been driven largely by technological advances and changes in the social, economic, and political climate. In the last three decades, the global policy landscape has shifted to become more focused on the potential of science, technology, and innovation to contribute to economic and social development. This shift has been driven by a recognition of the importance of science, technology and improving the quality of life for citizens. Governments are increasingly prioritising investments in science, technology, and innovation and providing incentives for private sector involvement in these areas.

At the same time, governments are recognising the need to ensure that these investments are conducted in a way that is socially and environmentally responsible. This has led to the development of policies designed to ensure that innovations are developed in a way that is beneficial for society, such as policies that promote the equitable sharing of benefits from technological advancements and policies that protect vulnerable groups from the potentially adverse effects of rapid technological change.

The history of India's science technology and innovation (STI) policy may be traced back to the 1950s. In 1958, India's first Prime Minister, Jawaharlal Nehru, in collaboration with

eminent scientists Homi Bhabha, presented the Indian Parliament with the first scientific policy resolution (SPR). The period 1947 to 1973 are generally considered to be the phase of “policy for the sciences,” in which the primary focus was on establishing the country's essential infrastructure for science and technology, especially the expansion of the university system to provide the necessary S&T human resources (Krishna, 2016).

The first science and technology plan of India for the years 1974-1979 marked the beginning of the formal process of formulating science and technology policy in India. This plan made it very clear that the objective was to achieve indigenous technological capacities in a variety of different fields. In the 1970s and 1980s, in an effort to preserve and expand the local research and technological base, the policies of self-reliance and import substitution were strengthened, which had significant repercussions for public research institutions. These concerns were further articulated in the 1983 “Technology Policy Statement,” which reiterated the need to strengthen institutions in order to build India's indigenous technological capacity. This statement was issued in response to the growing concern that India was falling behind in technological innovation. The decades of the 1970s and 1980s are generally regarded as the phase of “S&T for policy” during which India entered the nuclear and space clubs of the world with some remarkable technological breakthroughs in these fields of research and innovation. During this period, India also made a remarkable progress in the green revolution by conducting agricultural research and utilising new technologies.

Major economic and liberal changes were implemented in 1991, but no new formal science and technology policy documents were produced until 2003. With the economic liberalisation of 1991, changes in several sectors of the economy, including various S&T industries, occurred. One of the most significant developments in S&T policy since 2003 has been the emphasis on globalisation and exports.

This is the period when India's ICTs software, pharmaceutical, automotive, and telecommunications sectors experienced significant growth and dynamism. During this time, Indian science and technology policy fiercely enhanced and promoted the strategic sectors of atomic energy, defence, and space research. India's ICTs, pharmaceutical, automotive, and telecommunications industries experienced significant growth and dynamism during this period. The Indian government's policy regarding science and technology maintained its commitment to vigorously strengthening and promoting the strategic fields of atomic energy, defence, and space research. Since the year 2004, one hundred different multinational

corporations have established research and development centres in the country in order to capitalise on the country's advanced ICTs capabilities as well as its relatively high rates of economic growth.

### **Scientific Policy Resolution, 1958**

In 1958, the Indian parliament approved a resolution titled as the Scientific Policy Resolution. The purpose of the resolution was to enable the creation of a scientific and technological infrastructure in India that would promote the economic growth of the country. The resolution declared the importance of the development of science and technology in India, and emphasised that it was the duty of the government to promote scientific and industrial progress. It also advocated for the establishment of scientific research institutes and the advancement of industrial research and development. The resolution also provided for the creation of a scientific advisory council and a scientific advisory board, to advise the government on various matters related to science and technology. Ultimately, the goal of the resolution was to ensure that India would have the necessary resources to be able to become self-sufficient in the field of science and technology ([india.gov.in](http://india.gov.in)).

Scientific Policy Resolution, 1958 was India's first step toward embracing science. The government led by India's first Prime Minister, Jawaharlal Nehru, drafted this two-page document. It is widely assumed, however, that it was written by India's legendary physicist, Homi Jehangir Bhabha, the first scientific adviser to the Indian cabinet. This decision gave birth to the scientific enterprise in India.

The resolution's intellectual motivation was to use science as a tool for national development. Since his earliest days as leader, Nehru envisioned a welfare state to alleviate India's poverty. He believed that the welfare state could be expedited by using science to persuasive effect. He viewed science through the lens of India's socioeconomic requirements. India was endowed with a wealth of raw materials but lacked the means to extract and utilise them for national development. Therefore, he desired to utilise science to effectively channel our natural resources towards welfare and development initiatives. Science was also intended to reduce income inequality. Thus, the SPR, 1958 viewed science and technology as a major contributor to nation-building and economic prosperity.

The policy made specific mention of its significance and included provisions for the cultivation of a culture, environment, and mechanism that are conducive to the growth and development

of the citizens' knowledge. In addition to this, the policy places an emphasis on the provision of sufficient opportunities for citizens to contribute their scientific expertise.

### **Technology Policy Statement, 1983**

Before the Technology Policy Statement (TPS) arrived in 1983, SPR, 1958 stood tall and alone for 25 years. In contrast to its predecessor, TPR looks deeply into a broad range of issues over the course of many pages. Technology Policy Statement provided a comprehensive roadmap for the government's vision and strategies for the development of science, technology and industry in India. The document also outlined the strategies for promoting public-private partnerships, foreign investment, and technology acquisition.

There are two sections to the TPS 1983. The first section of the policy framework, outlining the government's vision for the development of science, technology and industry in India. The document highlighted the need for promoting economic growth, poverty alleviation, and social justice through the development of science, technology and industry. The document also outlined steps for promoting the development of small and medium enterprises, encouraging the diversification of the industrial base, and promoting technological innovation.

The second section of the TPS 1983 suggested specific strategies and measures for consideration by the government of India. These include tax incentives, subsidies, and other fiscal measures in order to promote technological innovation; the establishment of technology parks and special economic zones; the promotion of research and development; the establishment of technology transfer mechanisms; and the promotion of foreign investment. The policy statement suggested for improving public and private sector coordination, as well as for developing human resources in the science, technology and industrial sectors.

### **Science and Technology Policy, 2003**

The Science, Technology Policy (STP) was notified in 2003. Its objective was to maintain its lead in scientific and technological advancements, to maintain its position as a competitive force in a world that is becoming more interconnected, and to achieve its primary objective of achieving equitable and sustainable development. It advocated for a significant increase in expenditures in the field of research and development with the objective of bringing those expenditures up to two percent of the gross domestic product.

STP, 2003 represents the transition to a post-liberalisation world dominated by globalisation, knowledge-based economy. 21<sup>st</sup> century India had established a complex network of scientific

institutions and produced sufficient human capital. However, there were significant shifts in how science was practised and where it was applied. This shift required substantial investments in research and development, a multidisciplinary approach, and international collaborations. With unprecedented advances in the IT field and the democratisation of the internet, as well as rapid globalisation, science has begun to influence nearly every aspect of life. In particular, science and technology are intertwined with the growth trajectories of nations. In light of this, the government formulated STP, 2003 in order to remain competitive in the global marketplace and meet our own aspirations.

### **Science, Technology, and Innovation Policy, 2013**

When compared to the science and technology policy that was announced in 2003, the Science, Technology, and Innovation Policy (STIP) 2013 represents a significant improvement in terms of its attempt to forge links between the science, technology and innovations.

The decade from 2010 to 2020 has been designated as an innovation decade. It was recognised that in order to remain globally competitive, a transition to a knowledge-based economy was required. This policy document was a step toward establishing a strong national innovation ecosystem. By 2020, the global share of publications will have increased from 3.5 percent to around 7 percent.

- Developing human resources in the field of science across all social groups.
- Creating state-of-the-art R&D infrastructure to achieve global leadership in select fields
- Taking India to the global scientific powers by 2020. Using scientific progress to achieve inclusive growth.
- Creating a favourable environment for private players to operate.
- Active public, private partnership (PPP) model engagements in translating R&D into commercial products.

### **Information Technology Act, 2000**

The Information Technology Act was enacted by the Indian Parliament in the year 2000. The Act was enacted to give legal sanction to electronic commerce and electronic transactions, to enable e-governance, and also to prevent cybercrime. Under this law, for any crime involving a computer or a network located in India, foreign nationals can also be charged. The law prescribes penalties for various cybercrimes and fraud through digital/electronic format. It also gives legal recognition to digital signatures (The Gazette of India, 2000).

It is the primary law applicable to cybercrime and e-commerce in India. The Act grants recognition to electronic records and digital signatures, so laying the groundwork for electronic governance and providing the legal basis for it. The Act required the establishment of a Controller of Certifying Authorities in order to implement regulations regarding the distribution of digital signatures.

It also includes the definitions of cybercrimes and the sanctions that are specified for them. In addition to this, it established a Cyber Appellate Tribunal with the purpose of resolving any conflicts that may arise from the new law.

The Information Technology Act may be considered as a prime legislation dealing with the issues of cybercrime, cyber terrorism and data protection and privacy. With the growth in the use of smartphones, the Act brought cell phones and other communication devices used for sending any text, video, audio or images under its purview. The provisions of the Act are applicable to the whole of India, including any offense committed outside India, if such contravention involves a computer, computer system or computer network located in India. The adoption of information technology law has facilitated the growth of eCommerce and trade and providing the law enforcing agency the iron hand to deal with cyber offenses effectively, making the country technologically vibrant (The Gazette of India, 2000).

### **National Policy on Information Technology 2012**

The policy is an expansion of the National Policy on Information Technology 1998. It outlines India's vision to become a global leader in the field of Information Technology (IT) and its related services.

The policy focuses on accelerating the growth of the IT sector, deepening its penetration in all sectors of the economy, and forming an enabling environment for innovation and entrepreneurship. The policy also aims to bridge the digital divide between urban and rural India, by making technology available to all.

The policy outlines seven key objectives:

- Make India the preferred destination for IT investment and development.
- Accelerate the use of IT in all sectors of the economy.
- Develop an environment conducive to innovation and entrepreneurship.
- Enhance digital inclusion, especially in rural areas.
- Enhance cyber security and privacy.

- Develop an IT-friendly regulatory and legal framework.
- Promote a culture of research and development in IT.

Some of the strategies outlined in the policy include establishing a National Digital Council, a National IT Investment Fund, and a National e-Governance Plan. It also emphasizes the need for increased public-private partnerships and the setting up of an IT-enabling infrastructure. The policy also outlines plans to promote the development of Indian languages, and to develop a comprehensive IT education and training framework.

### **National Digital Communication Policy 2018**

This policy document was launched by the government of India with the aim of providing a roadmap for the expansion of the telecommunications sector in India. The policy seeks to ensure that the benefits of digital communication reach all sections of society, including rural areas, and to promote the development of the digital economy.

The main objectives of the policy are:

**Provision of broadband for all:** Broadband access for everybody, even in rural areas and rural communities, at reasonable costs is a primary goal of the policy. It aims to provide a minimum download speed of 50 MBPS to every citizen and to provide 1 GBPS connectivity to all gram panchayats by 2020 and to all villages and habitations by 2022.

**Creation of a robust digital communications infrastructure:** The policy aims to create a robust and future-proof digital communications infrastructure that can support emerging technologies such as 5G, Internet of Things (IoT), and Artificial Intelligence (AI). The policy aims to encourage investment in the telecom sector and to promote the development of new technologies.

**Promotion of digital economy:** The purpose of the policy is to facilitate the expansion of the digital economy by creating a regulatory framework that is conducive to the normal functioning of businesses. Its primary objectives are to encourage financial investments in the digital economy and to foster the growth of digital competence among the labour force.

### **Telecommunication Bill 2022**

Recently the government of India released the draft of the proposed Telecommunication Bill. It aims to bring the existing regulatory framework up to date so that it is compatible with

various improvements and difficulties that are occurring in the sector. The bill proposes to replace the three laws which govern the telecom sector in India. They are:

1. Indian Telegraph Act, 1885: providing for licensing of telegraph-related activities and interception of communication,
2. The Indian Wireless Telegraphy Act, 1933: for regulation of possession of wireless telegraph apparatus, and
3. the Telegraph Wires (Unlawful Possession) Act, 1950 for regulation of possession of telegraph wires.

In addition, the Telecom Regulatory Authority of India (TRAI) has been set up under the TRAI Act, 1997 as the telecom regulator. The power to issue licenses remains with the central government.

DoT put out a draft of the Indian Telecommunication Bill, 2022, in which it proposed to regulate voice, video, and data communication services like WhatsApp and other social media application as telecom services and require them to get a licence from the government, just like other telecom operators do (Barik, 2022).

Over-the-top communication services are a type of service that allows users to communicate with one another in real time. Among the most well-known of these are the various messaging apps, such as WhatsApp, Messenger, Telegram, Google Duo, and Google Meet, amongst others.

### **Digital Personal Data Protection Act, 2023**

The Digital Personal Data Protection Act of 2023 represents a significant step forward in protecting individual privacy rights and supporting appropriate data management practises. This legislation recognises the growing importance of personal data protection and seeks to strike a careful balance between individual rights and legitimate data-processing obligations of organisations. The Act's goal is to establish safeguards for personal data and to protect people's privacy rights (The Gazette of India, 2023).

### **ICTs Policy in India**

The Government of India has formulated ICTs policy to ensure the growth and development of the ICTs sector in the country. The policy aims to create a conducive environment that will support the growth of the sector and ensure its smooth functioning.

The policy focuses on:

- Promoting the use of ICTs for socio-economic development
- Promoting the development of new technologies, products and services
- Encouraging the use of ICTs for efficient delivery of public services
- Strengthening the security, privacy and legal framework for ICTs
- Promoting the development of the digital infrastructure
- Supporting the development of digital skills and literacy
- Supporting the growth of the ICTs industry
- Encouraging investment in the ICTs sector
- Strengthening the regulatory and policy framework
- Promoting the development of indigenous ICTs industry.

ICTs has emerged as an important platform for the implementation of effective governance strategies in the contemporary era. Governments and public institutions are increasingly turning to ICTs to improve their governance processes, from public services and data management to decision-making, public engagement, and reaching out to the last sections of the society.

### **ICTs as Socio-technical Entities**

ICTs are often referred to as socio-technical entities because they are both social and technical in nature. They are not just tools or devices that we use, but are complex systems that are shaped by and in turn shape the social and cultural contexts in which they are used. ICTs is influenced by a range of factors, including social norms, cultural values, economic interests, and political power relations.

ICTs are become increasingly embedded in society and culture. They have a tremendous impact on people's lives, the way they communicate, work, shop and interact with others. At a broader level, ICTs are forcing us to re-evaluate our understanding of the world and the way we interact with it. They are changing the way we think about social and political power, our relationships with each other, and our relationship with the environment. As these changes occur, it is important to understand the implications for social and political structures, our cultural norms, and our rights and responsibilities. ICTs as socio-technical entities refer to how these technologies integrate with pre-existing social structures and practices, altering those structures. It is an essential part of understanding the impact of ICTs on society.

## **Genesis of ICTs and Governance**

The concept of ICTs and governance is closely linked. ICTs provides the tools that enable organisations to operate more efficiently and effectively. The governance helps ensure that those tools are used in an effective and responsible manner. For example, ICTs can be used to automate processes, reducing the time needed to complete tasks, but governance helps ensure that those processes are being used appropriately. Similarly, ICTs can provide access to data that can be used to make informed decisions, but governance helps ensure that those decisions are being made in an ethical and responsible manner.

The evolution of ICTs and e-governance has been a gradual advancement in technology and how citizens interact with the government. Over the past few decades, ICTs has transformed the way governments communicate and deliver services to citizens. This has led to an increased emphasis on e-governance.

The e-Governance was first proposed in the early 1990s. As the internet began to expand, governments around the world started to recognise the potential of leveraging technology to provide better service to citizens. This sparked the development of e-governance initiatives, which aimed to make government services more accessible and efficient through the use of digital technologies. The goal was to enable governments to provide better services to the citizens and businesses, while also reducing costs and bureaucracy. By the early 2000s, e-governance had become a global phenomenon, with governments in many countries implementing various initiatives. Today, e-governance is used in a variety of ways, from allowing citizens to apply for government services online, to providing citizens with real-time access to government data.

The Department of Electronics was established in the 1970s in response to the growing significance of electronics at that time. NIC was subsequently established in 1977. This was the first major step towards the implementation of e-governance in India because it put emphasis on the communication of information. At the beginning of the 1980s, very few companies utilised computers in their daily operations. The introduction of personal computers made it possible for government offices to make use of the storage, retrieval, and processor speed of computers.

In the late 1980s, a significant number of government offices owned computers, but the vast majority of those computers were only used for word processing. Computers were gradually put to use for various other purposes, such as the management of databases and the processing

of information. Several government departments began using information and communications technology for various applications, such as monitoring social welfare programmes, tracking the movement of papers and files, and financial services. Since its inception in 1987, the electronics technology has been the driving force behind e-governance. After this, the NIC launched its District Information System (DISNIC) programme to provide free hardware and software to all state governments in order to computerise their district offices.

National e-Governance Plan (NeGP) was launched in 2006 and introduced e-governance. Technology was used to increase public service efficiency, transparency, and efficiency in the e-governance processes. It aims to “empower citizens using (ICTs) to access government services and information” (<https://www.meity.gov.in/divisions/national-e-governance-plan>).

The NeGP was implemented in two phases. During the first phase, the focus was on developing and deploying ICTs infrastructure, including the creation of State Wide Area Networks (SWAN) and State Data Centers (SDC). During the second phase, the focus shifted to the development and application of e-governance applications and services.

### **National E-Governance Plan**

The NeGP program is being implemented by various government agencies and departments at the central, state, and local levels. The program has made significant progress in various areas, including digitizing land records, issuing birth and death certificates, and delivering various social welfare schemes to citizens.

**Infrastructure development:** This includes the creation of a secure and robust infrastructure for e-governance. As part of it, State and District Wide Area Networks (SWAN and DWAN) were set up across all states. In Odisha the common service centres were set up under this initiative.

**Service Delivery:** This involves the development of e-governance applications to enable citizens to access a range of government services easily and conveniently. These include online applications for citizen services, online bills payment, e-procurement, e-filing of taxes, etc.

**Capacity building:** This involves training and capacity building of government employees to use e-governance applications and make them more efficient.

In addition to the above, the focus of the state has also been on to use ICTs to improve service delivery, transparency, accountability, and efficiency in the delivery of public services. The

NeGP is structured into 27 Mission Mode Projects (MMPs) and eight components. The MMPs are divided into five categories: social and welfare services, financial and tax services, commercial services, education and health services, and utility services (MeitY, 2020).

The NeGP involves the use of ICTs at all stages of service delivery, including planning, development, implementation, monitoring, and evaluation. The NeGP focuses on three key objectives:

1. To improve public service delivery by making it more citizen-centric, transparent, and accountable.
2. To create a framework for the use of technology to improve governance quality and efficiency.
3. To promote the use of technology to empower citizens, businesses, and other stakeholders.

The NeGP program is a crucial initiative in improving the quality of governance in India, making government services more accessible and transparent, and bridging the digital divide between urban and rural areas.

### **Understanding the Social Structure of ICTs**

The social structure refers to the patterns of relationships, roles, norms, and institutions that govern social interactions and organisation. Social institutions are the established structures and systems that govern various aspects of society. These include family, education, government, economy, religion, and healthcare systems. Institutions provide frameworks for social behavior, define roles and responsibilities, and shape individuals' lives within society.

The social structure of ICTs refers to the way in which ICTs tools and technologies are used and organised within societies. The development of new social structures, such as online communities, social networks, and digital economies, has been facilitated by the proliferation of ICTs. ICTs significantly impacts these social structures, as it can affect social relationships, power dynamics, and access to resources. These new structures have created new forms of social interaction, communication, and exchange, which have transformed traditional social structures such as family, community, and work. One of the most significant changes brought about by ICTs has been the rise of the knowledge economy, in which information and

knowledge are the primary sources of economic value. This has led to the creation of new industries and job opportunities, as well as changes in the way work is organised and performed.

ICTs has also facilitated the rise of a global network society. It has revolutionised communication by providing new channels and platforms for interaction. Social media, instant messaging, email, and video conferencing enable people to connect and communicate across geographic boundaries, fostering global networks and virtual communities. These technologies have transformed the way people form relationships, share information, and engage in collective action, potentially leading to the emergence of new social norms and practices.

The social structure of ICTs is also characterised by inequalities in access to technology and digital skills, which can reinforce existing social inequalities such as gender, ethnicity, and socioeconomic status. There is a digital divide between those who have access to technology and the internet and those who do not. This divide can be based on factors such as income, education, geographic location, and social class. The unequal access to ICTs can contribute to social stratification, reinforcing existing disparities and limiting opportunities for marginalised groups. Moreover, the social structure of ICTs is also influenced by the governance and regulation of the technology industry, which can affect issues such as privacy, security, and data protection.

### **Social Structure of ICTs in India**

India has a unique social structure of ICTs, shaped by its diverse population, rapid technological advancements, and government policies. The social structure of ICTs in India is characterised by a growing digital divide, unequal access to technology and digital skills, and the emergence of new forms of social interaction and commerce.

The social media platforms such as WhatsApp, Facebook, Instagram, and Twitter have transformed the way people communicate, share information, and form social networks. Social media has become a powerful tool for political mobilization, social activism, and cultural expression in India. However, the social structure of social media in India is also characterised by the spread of misinformation, cybercrime. These issues have raised concerns about the need for regulations to ensure the responsible use of social media and the protection of individual rights.

The rise of e-commerce platforms such as Flipkart, Amazon, Myntra and Paytm. These platforms have transformed traditional retail structures and created new forms of social interaction and commerce. With the increasing adoption of smartphones and digital payments, e-commerce has become an integral part of the Indian economy and has created new job opportunities for millions of people. However, the growth of e-commerce has also reinforced existing social inequalities in India. For instance, the digital divide between urban and rural areas has led to unequal access to e-commerce platforms and digital payment systems. Moreover, the dominance of large e-commerce companies has raised concerns about their impact on small and medium-sized businesses and the need for regulations to ensure fair competition.

The growth of digital payment systems like Phone Pay, BHIM, Paytm, and Google Pay has made it easier for people in India to make and receive payments, particularly in rural areas where access to traditional banking services is limited. These platforms have also helped to promote financial inclusion and reduce the reliance on cash, which promotes economic growth.

The social structure of ICTs in India is complex and constantly evolving, shaped by technological advancements, social inequalities, and government policies. The challenge is to ensure that the benefits of ICTs are widely shared and that its impact on society is positive and inclusive.

India is home to more than 80 crore internet users, 133 crore Aadhaar cards, and more than 75 crore smartphones. Additionally, the country has 4G network and is moving quickly towards 5G network. Its data tariffs are among the most cost effective in the world. We have the ability to improve people's lives in ways that were nearly impossible to conceive of just a couple of decades ago because to the advancements that have been made in digital technology (TRAI, 2022).

Thomas (2011) explored the impact of digital technology on Indian society. He discussed how digital technology has shaped the way people access information, communicate with each other, and interact with the wider world. He has also examined the implications of this digital revolution for India's economic and social development. His research has uncovered the potential for digital technology to improve the lives of Indians, but also the potential risks that must be managed. Thomas argues that the digital revolution has the potential to transform India into a more equitable, prosperous, and inclusive nation, but that it also presents considerable challenges, particularly in terms of access to technology and digital literacy. He also discusses

the need for India to embrace the digital revolution in order to remain competitive in the global economy, and outlines the government's role in creating a digital infrastructure that is both secure and accessible.

Lupton (2014), in the book "Digital Sociology", explores how digital technologies transform various aspects of social life, including communication, work, leisure, and intimate relationships. She argues that these changes are not simply technological but are also deeply social and cultural, reflecting the values, norms, and power relations that exist within society. Lupton refers to the concept "digital embodiment," as the ways in which digital technologies are increasingly integrated into our bodies and identities. This includes wearable devices, social media profiles and other forms of digital representation that allow us to connect with others and express ourselves in new ways (Lupton, 2014; 2017).

The sociological literature on the social structure of ICTs in India highlights the complex interplay between technology, society, and power dynamics. It emphasises the need for a critical and nuanced approach to understanding the impact of ICTs on social structures and for policies that ensure the benefits of ICTs are widely shared and inclusive.

Through interactive contact and the sharing of information among a wide variety of stakeholders, electronic governance serves as an essential component of effective governance. It contributes to the enhancement of the democratic process. The social structure of ICTs is important because it helps to create an environment where people can work together effectively and efficiently. It also helps to ensure everyone is on the same page and that all the necessary steps are taken to achieve a goal.

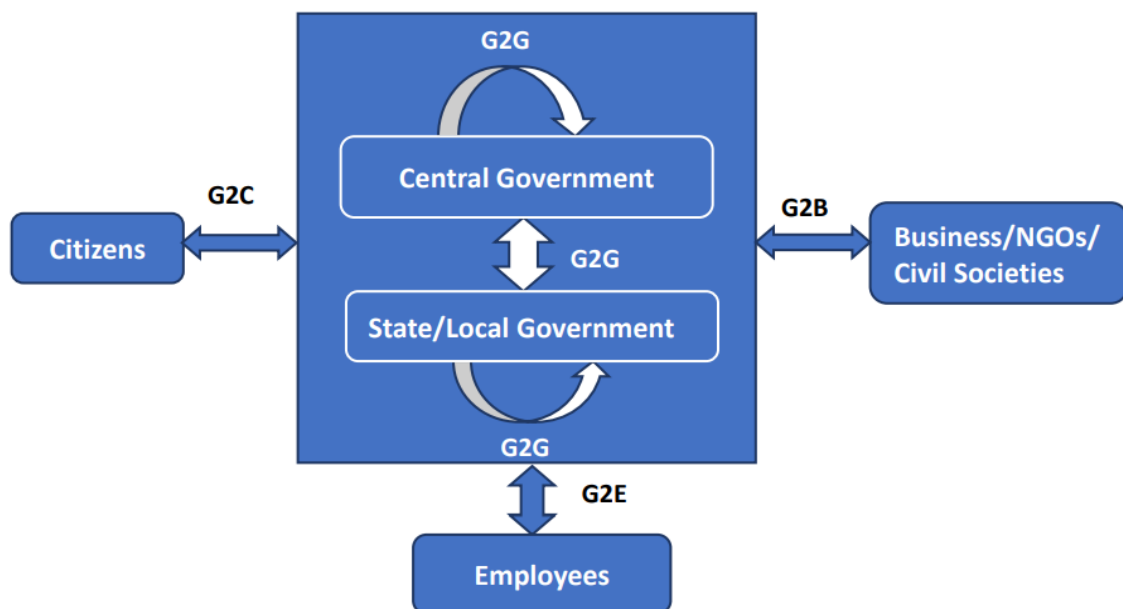
There is a growing consensus that ICTs plays a crucial enabling role in public and government service delivery. This has resulted in a transnational governance revolution. When considering the modern challenges of managing government institutions for the purposes of achieving quick economic growth and an enhanced quality of life, the significance of e-governance becomes apparent (Yadav & Tiwari, 2014).

### **ICTs in Governance**

The sociology of ICTs and e-governance is the study of how technology, including the internet and other digital communication systems, affects the structure and operation of governments and other public organisations. It examines how governments use technology to collect, store, and analyse data to inform public policy decisions. It also looks at the impact of technology on

government transparency and accountability, the adoption of e-governance practices, and how the use of ICTs affects the relationships between governments and citizens. Additionally, it looks at how ICTs are used to foster improved communication, collaboration, and coordination between public organisations and their stakeholders, the effects of technology on public governance, and how technology can be harnessed to improve public services. The rise of technology has led to a new era of communication and a shift in how governments interact with citizens. The introduction of ICTs and e-governance has enabled governments to become more efficient and effective in their operations and service delivery (Paul, 2007, Sangita & Dash, 2008).

**Figure No 3.1: Structure of e-Governance Interaction**



Source- Ministry of Electronics and Information Technology (MeitY)

### **Types of E-Governance**

There are numerous e-governance programmes in place to provide citizens with convenient access to various state and federal government departments, district administrations, and local self-governments while streamlining government processes. E-governance will boost accountability and transparency, make government services more convenient for citizens, reduce corruption, enhance government efficiency, free up government workers' time, raise revenue, lower costs, and improve the interaction between government and industry.

### **Government to Government (G2G)**

The electronic sharing of information between different levels of government, such as between the central, state, and local levels of government, also different levels of government within the same entity. This kind of interaction not only ensures that governmental operations are carried out in an open and accountable manner but also helps in saving time and money. Inter-office teleconferencing, electronic bill stamping, and online budget systems are a few examples of the types of services that fall under the G2G umbrella.

### **Government to Business (G2B)**

G2B interaction involves businesses selling products and services to the government and citizens. The government gives opportunities and directions to various enterprises that are involved in selling or trading goods and services to individuals and government bodies. The G2B initiative consists of licencing permits, revenue collection, and investment. This contributes to fostering an environment conducive to enhanced corporate performance.

### **Government to Employee (G2E)**

G2E describes the use of digital technologies to streamline, transform, and improve the services and interactions between the government and its employees. This type of e-governance is designed to make the payroll and other HR administration processes more efficient while also enhancing employee engagement and creating an improved overall work environment. G2E e-governance can include time and attendance tracking, automated payroll processing, employee recognition programs, employee self-service portals, and other digital services. It permits coordination with other government employees at any time and in any location. Software for keeping personnel information and staff records that can be accessed quickly and simply are examples of G2E services.

### **Government to Citizen (G2C)**

G2C interaction refers to activities in which the government gives citizens with internet access to information and services. An interface is developed between the government and citizens in this type of contact to provide access to information about various processes and requirements for various public services. It facilitates public availability and accessibility citizen services and enhances the quality of such services. This interface focuses primarily on building a cordial interaction between the public and government.

## Citizen to Government (C2G)

Citizen to Government (C2G) interaction refers to actions in which the government accepts feedback and application forms from citizens in prescribed formats for various public services. It allows citizens to ask the government questions, pay taxes, renew driving licences, and so forth. In this way, it enables residents to benefit from a wide range of government-provided public services. Citizens can communicate with the government 24\*7 by using the internet, fax, telephone, and other communication tools (DeitY, 2016).

**Table No 3.1: NeGP Project of GoI Services**

| Sl. No | Mission Mode Project | Government Services                                                                                           |
|--------|----------------------|---------------------------------------------------------------------------------------------------------------|
| 1      | Central MMP          | Banking, Income Tax, Passport, MCA21, Insurance, UID, Post, e-Office                                          |
| 2      | State MMP            | Agriculture, Education, Health, Police, PDS, e-District, Land records, e-Panchayat, Municipalities, transport |
| 3      | Integrated MMP       | CSC, e-Courts, e-Procurement, NeGP, Service delivery gateway                                                  |

Source: <https://www.meity.gov.in/divisions/national-e-governance-plan>

## ICTs Development in India

ICTs devices have spread throughout various sectors of the economy, education, business, health and polity including government and society. The governments of most developing nations are actively pursuing the goal of attaining economic development through boosting the penetration of information and communication technologies. In India, ICTs efforts range from enabling rural citizens to use technology to access social welfare schemes and receive funds via direct benefit transfer and online tax filing for enterprises to offering healthcare services to remote rural areas.

India is the world's second-largest telecommunications market, with rapid expansion over the last decade. As of November 2021, the country has 1.17 billion (wireless and wireline) mobile subscribers as on March 2023. Out of which the rural telephone subscriber is 518.63 million and urban telephone subscriber is 653.71 million. The number of broadband subscribers increased to 846.57 million in the end of March 2023 (TRAI, 2023). The overall tele density of India stands at 84.51 percent (rural, 57.71 percent and urban, 133.81 percent).

### **Telecommunication at a glance**

- Indian became the second highest number of internet subscriber in the world and it reached 850.95 million in September 2022.
- The total internet subscribers per 100 population is 61.62 percent. The rural and urban internet subscriber is 38.33 percent and 104.77 respectively.
- India has the second largest subscriber base of telecom network of 1167.82 million in April 2022.
- The highest investment came from foreign direct companies. FDI inflows in the telecom sector is 38.33 billion between April 2000 to March 2022.
- India is the biggest wireless data consumer; the average of a data subscriber was 14.1 GB per month in FY20.
- There are a total of 5,97,618 inhabited villages in the country, however 25,067 of those villages do not have mobile connectivity or internet access. (Table No 4.2)

The introduction of ICTs and e-governance has positively impacted the relationship between governments and citizens (Dash and Pani, 2016; Bindu et al., 2019). ICTs has enabled governments to interact with citizens more quickly and efficiently and provide a wider range of services. For example, ICTs has allowed governments to provide citizens access to online forums to voice their opinions and concerns about government policies and programs. This has helped to create a more open and transparent dialogue between citizens and their governments. ICTs and e-governance have also reduced citizen service expenses. Instead of maintaining many locations, governments can now serve citizens from a central location, delivering services faster and cheaper.

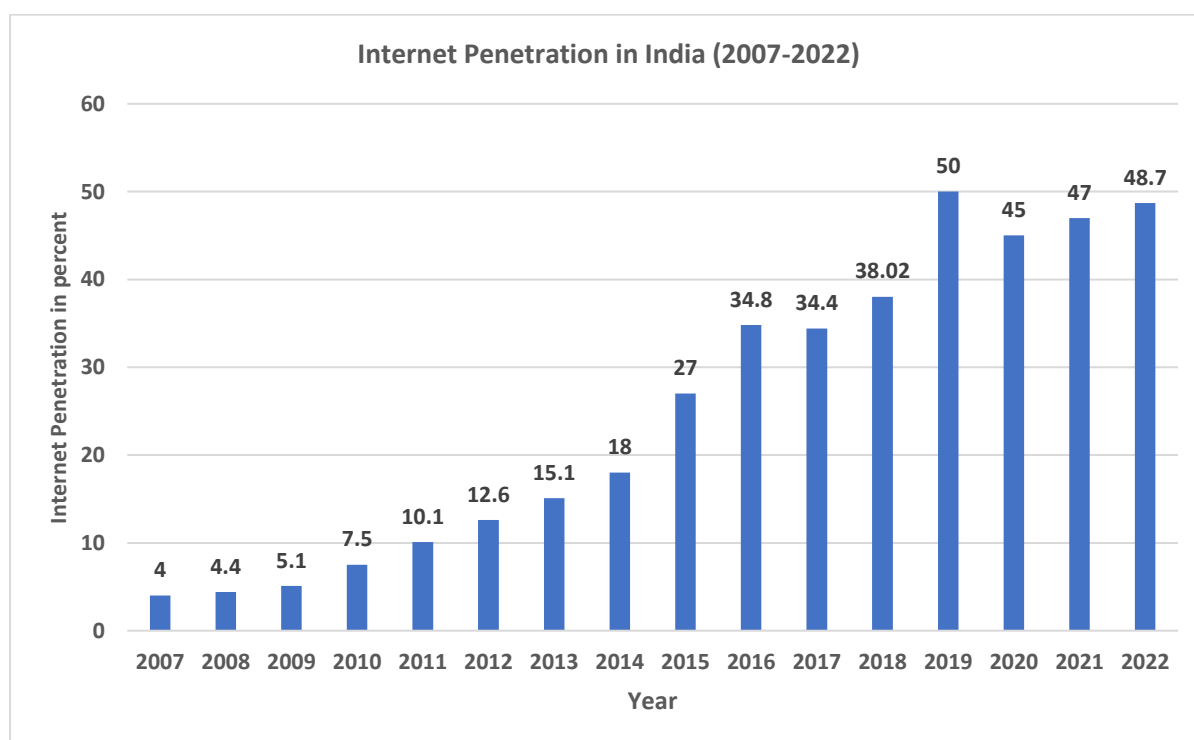
The development of ICTs in India has been increasing steadily over the past decade. The government of India has taken several steps to promote the growth of ICTs in the country. In the past few years, the government has focused its efforts on building infrastructure, providing access to the internet, and creating favourable policies to encourage the growth of the ICTs sector.

The use of ICTs devices has spread throughout various sectors of the economy, education, business, health and polity including government and society. The governments of most developing nations are actively pursuing the goal of attaining economic development through boosting the penetration of information and communication technologies. In India, ICTs efforts range from enabling rural citizens to use technology to access social welfare schemes and

receive funds via direct benefit transfer and online tax filing for enterprises to offering healthcare services to remote rural areas.

There has been a significant expansion in the field of telecommunications in recent years, which is a key component of ICTs sector. With more than 1.2 billion people subscribing to telephone service, India is the second largest telecom market after China (TRAI, 2021).

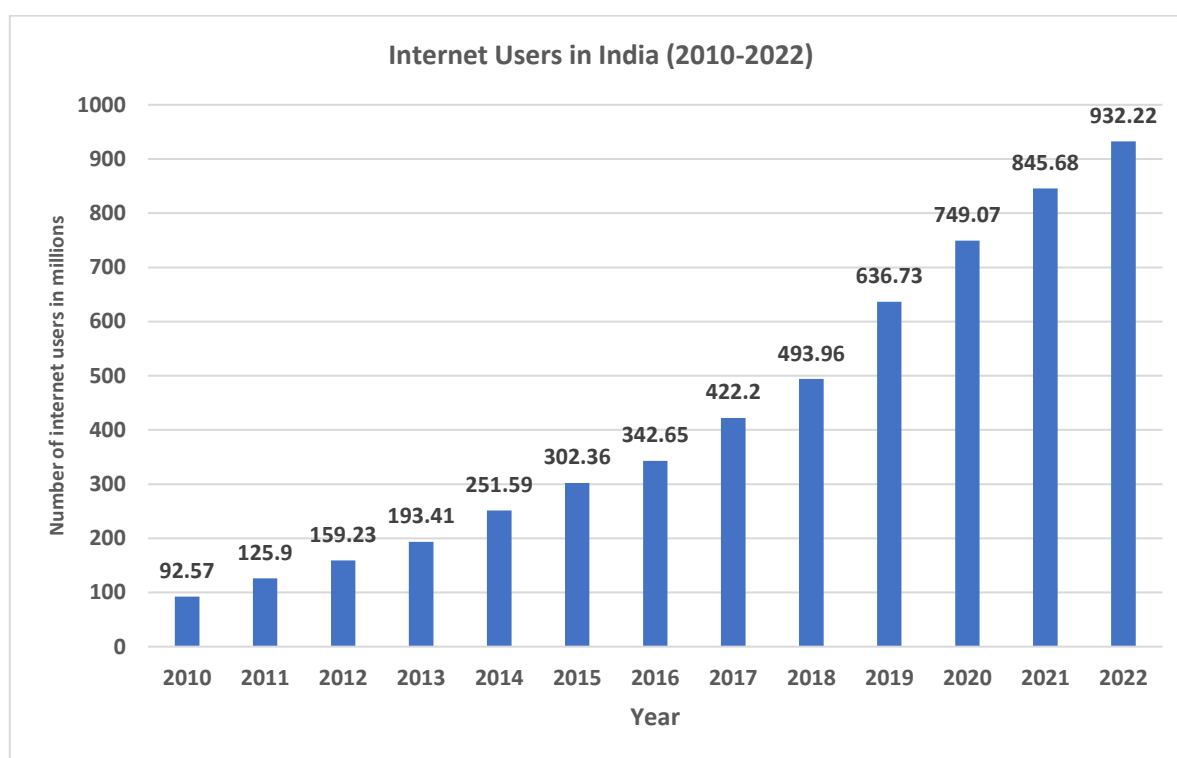
**Figure No 3.2: Internet Penetration of India**



Source: Statista and TRAI Report (2007-2022)<sup>†</sup>

<sup>†</sup> The data are compiled from Statista website and Telecom Regulatory Authority of India (TRAI) year wise Annual Report from 2007 to 2022.

**Figure No 3.3: Internet Users in India**



Source: Statista and TRAI Report (2010-2022)

Figure no 3.2 on internet penetration shows the increase in the active internet users from 2007 to 2021, which is about an increase from just four percent to forty five percent. The forty five percent penetration of internet appears to be low when compared to the size of India's population, but it can be said that nearly half of the population have been accessing internet. Indian is the second country in the world after China in terms of active internet users.

Figure no 3.3 shows that there are 845 million internet users in the country and there is an increase from 92.57 million to 845.68 million in the span of 11 years, from 2010 to 2021.

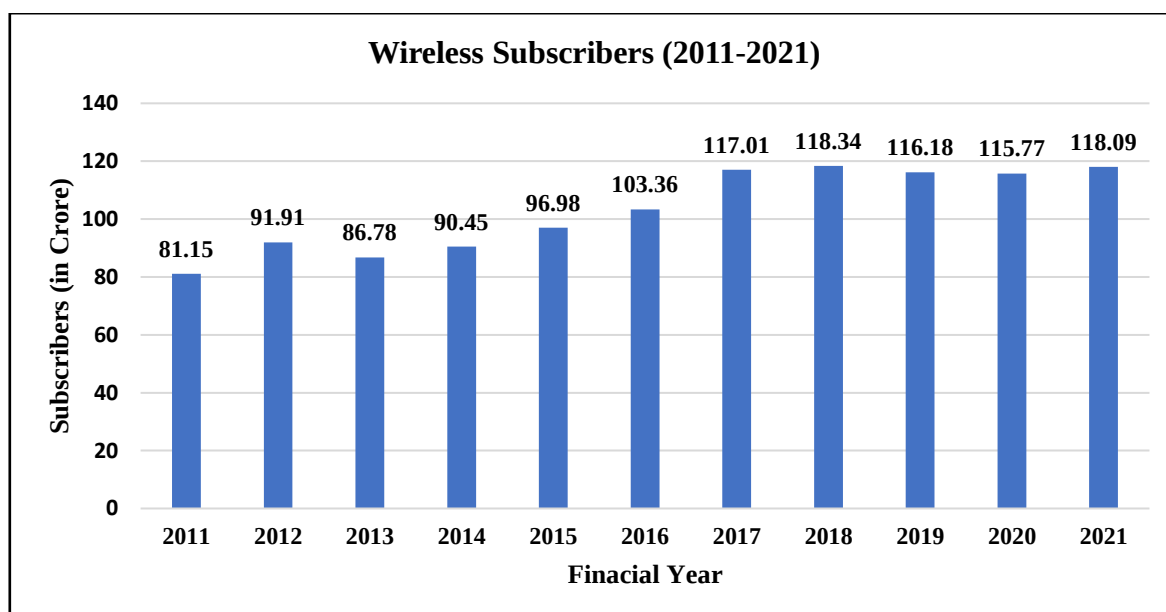
**Table No 3.2: Tele density in India**

| Tele density (Per 100 Inhabitants) in India (As on 31st March, 2006 to 2020) |          |          |       |       |       |        |         |
|------------------------------------------------------------------------------|----------|----------|-------|-------|-------|--------|---------|
| Year (As on 31st March)                                                      | Wireline | Wireless | Total | Rural | Urban | Public | Private |
| 2006                                                                         | 3.61     | 9.13     | 12.74 | 2.34  | 38.28 | 5.48   | 7.26    |
| 2007                                                                         | 3.61     | 14.61    | 18.22 | 5.89  | 48.1  | 6.32   | 11.9    |
| 2008                                                                         | 3.44     | 22.78    | 26.22 | 9.46  | 66.39 | 6.94   | 19.28   |
| 2009                                                                         | 3.27     | 33.71    | 36.98 | 15.11 | 88.84 | 7.71   | 29.27   |

|      |      |       |       |       |        |       |       |
|------|------|-------|-------|-------|--------|-------|-------|
| 2010 | 3.14 | 49.6  | 52.74 | 24.31 | 119.45 | 8.99  | 43.75 |
| 2011 | 2.91 | 67.98 | 70.89 | 33.83 | 156.93 | 10.55 | 60.34 |
| 2012 | 2.66 | 76    | 78.66 | 39.26 | 169.17 | 10.77 | 67.89 |
| 2013 | 2.47 | 70.85 | 73.32 | 41.05 | 146.64 | 10.62 | 62.69 |
| 2014 | 2.3  | 72.94 | 75.23 | 44.01 | 145.46 | 9.68  | 65.55 |
| 2015 | 2.12 | 77.24 | 79.36 | 48.04 | 149.04 | 7.99  | 71.36 |
| 2016 | 1.99 | 81.41 | 83.4  | 51.26 | 154.18 | 8.55  | 74.85 |
| 2017 | 1.9  | 91.11 | 93.01 | 56.98 | 171.52 | 9.51  | 83.5  |
| 2018 | 1.76 | 91.51 | 93.27 | 59.25 | 166.64 | 10.13 | 83.14 |
| 2019 | 1.65 | 88.45 | 90.1  | 57.5  | 159.66 | 10.16 | 79.94 |
| 2020 | 1.44 | 87.22 | 88.66 | 57.87 | 153.68 | 10.17 | 78.49 |

Source- Indiatat <https://www.indiastat.com/>

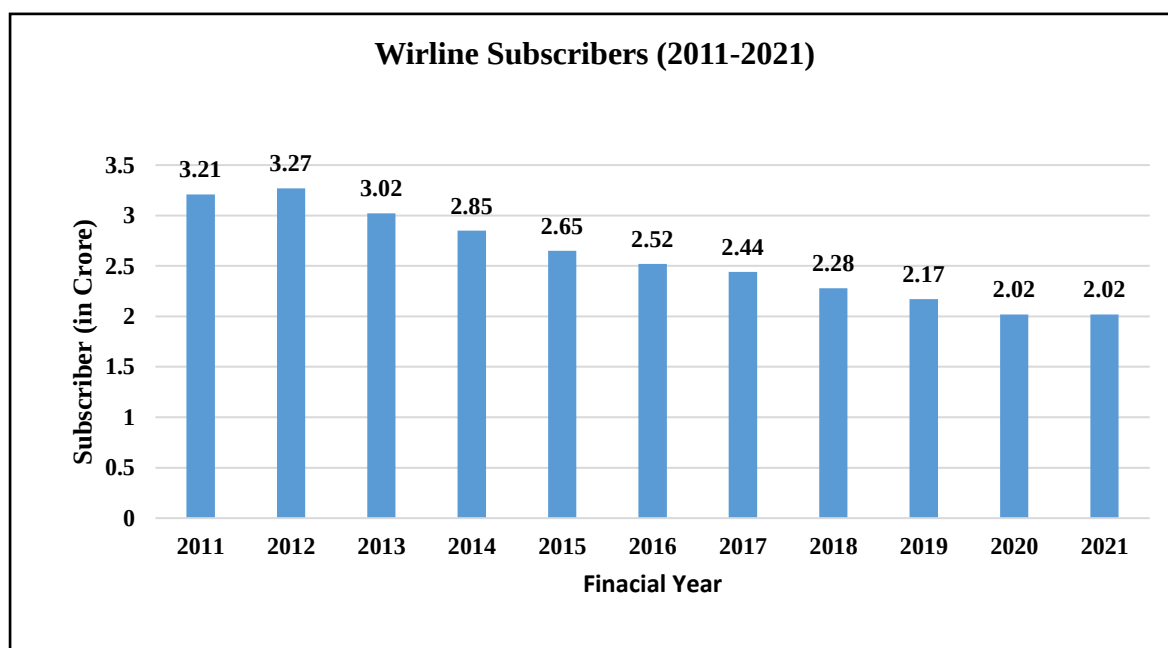
**Figure No 3.4: Wireless Subscriber base in India (March 2011-2021)**



Source- TRAI Annual Report 2021

There is an exponential growth in the subscriber base in India. Now India is the second largest mobile subscriber in India. Figure No 3.3 presents data on wireline subscriber base which has increased from 81.15 crore to 118.09 crore in the span of one decade, from 2011 to 2021.

**Figure No 3.5: Wireline Subscriber base in India (2011-2021)**



Source- TRAI Annual Report 2021

Due to the sharp increase in the smart phone penetration, because of factors like low-cost smart phones, cheap data, etc. the smart phone penetration witnessed a sharp rise in the country. Figure No 3.4 shows the decrease in wireline subscribers from 2011 to 2021, from 3.21 crore to 2.02 crore.

### **Common Service Centre (CSC)**

A CSC is an information technology-enabled service delivery platform set up by the Government of India to deliver various e-governance and business services to the public. CSCs are also known as Digital Seva Kendras. They are part of the Digital India program and are operated by the Ministry of Electronics and Information Technology (MeitY). The CSC program aims to provide convenient, reliable and secure access to a wide range of government and non-government services to citizens in their own villages and towns. CSCs are operated by entrepreneurs trained in information technology and provide services such as e-governance applications, banking, insurance, education, health, agriculture, utility payments and other services.

*“Common Services Centre programme is an initiative of the Ministry of Electronics and IT (MeitY), Government of India. CSCs are easy access points for delivery of various digital services to rural and urban people in India, thereby contributing to a digitally and financially inclusive society. In rural India, CSCs are service*

*delivery points and change agents, promoting rural entrepreneurship and building rural capacities and livelihoods. CSC e-governance Services India limited is incorporated under the Companies Act, 1956, which provides a centralised collaborative framework for the delivery of services to citizens through CSCs, besides ensuring systematic viability and sustainability of the scheme. The CSCs offer web-enabled e-governance services in rural areas, including applications for Passport, PAN card, Aadhaar, Voter ID, Ration Card etc, various Government certificates, and utility payments such as electricity, telephone and water bills. People can access high quality and cost-effective video, voice and data content and services, in the areas of e-governance, education, health, telemedicine, tele-law, entertainment as well as other private services through CSCs” (csc.gov.in; cscindia.info).*

It was envisaged in the CSC 2.0 that people in rural areas will be able to access electronic services through Digital India's network of CSCs located in 2.5 million Gram Panchayats. In this direction, the number of CSCs in Gram Panchayats increased from one lakh to 1.5 lakh. The entrepreneurial model CSC 2.0 uses SWAN, SSDG, e-District, and BharatNet to provide people with various services.

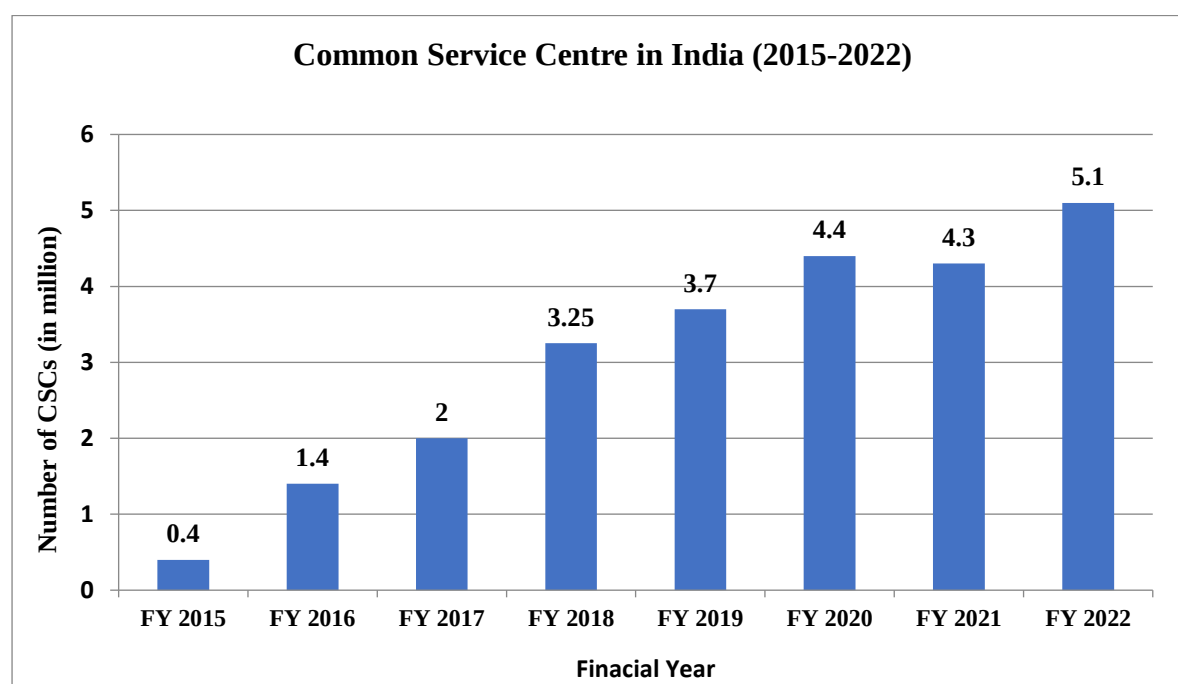
There are 5,10,240 CSCs across India as of April 2023, out of which the number of functional CSCs is 4,04,254 in rural areas and 1,05,986 in urban areas. The number of transactions through the digital seva portal is 289.64 lakh, and 131.05 lakh through a non-digital seva portal (<https://csc.gov.in/>).

### **Village Level Entrepreneurs (VLEs)**

The CSCs across India are set up in the private enterprise mode. The day-to-day operations are managed by the individuals who obtain license to run the CSCs. The software, access to government portals and data is provided by the government agencies. The entrepreneur who sets up the CSC has to invest on the physical space for the visitors, employees of the CSC and the computers and printers. The individuals who obtain the license to run the CSC are called as village level entrepreneurs (VLEs). The VLEs are responsible for delivering various services to the rural citizens. The VLE scheme is a part of the common service centre program, which is an initiative of the Government of India to provide e-governance services to rural areas.

The VLEs in India offer a range of services, including digital services such as Aadhaar enrolment, online ticket booking, utility bill payments, and banking services. They also provide access to government schemes and social welfare programs. In addition to digital services, the VLEs also provide various non-digital services, such as the sale of agricultural inputs and outputs, healthcare services, and education-related services, which play a crucial role in promoting entrepreneurship and creating employment opportunities in rural areas. They provide much-needed access to essential services and contribute to the overall development of the rural economy. A network of 5.4 lakh VLEs were working of which 4.35 lakh are in gram panchayat (CCS, MeitY, 2022).

**Figure No 3.6: Common Service Centres in India**



Source- Statista and csc.gov.in

Figure 3.6 shows the number of common services centres established in India. The data shows that there is an increase of digital centres in India from 0.4 million to 5.1 million in a period of eight years from 2015 to 2022.

### **Common Service Centres in India (State Wise)**

The CSC project envisions the establishment of at least one CSC in every gram panchayat level for the delivery of different G2C and other citizen-centric services. There are 2.50 million

Gram Panchayats (GPs) in the country. It is a paradigm of self-sustaining enterprise maintained by VLE. It is a mission mode project under the Digital India programme.

As of December 2021, the number of CSCs functioning in villages is 3,48,391 out of the total 4,46,789 CSCs operational across the country.

**Table No 3.3: Number of Common Services Centres (CSCs) in India**

|         |                    | Functional CSCs (Urban+ Rural)     | Functional CSCs at GP level        |
|---------|--------------------|------------------------------------|------------------------------------|
| Sl. No. | State/UT           | As on 31 <sup>st</sup> December 21 | As on 31 <sup>st</sup> December 21 |
| 1       | Andhra Pradesh     | 9042                               | 6694                               |
| 2       | Arunachal Pradesh  | 143                                | 108                                |
| 3       | Assam              | 9384                               | 8513                               |
| 4       | Bihar              | 39745                              | 35366                              |
| 5       | Chhattisgarh       | 17441                              | 13838                              |
| 6       | Goa                | 127                                | 85                                 |
| 7       | Gujarat            | 13132                              | 9154                               |
| 8       | Haryana            | 18880                              | 13263                              |
| 9       | Himachal Pradesh   | 4661                               | 4097                               |
| 10      | Jharkhand          | 16465                              | 13993                              |
| 11      | Karnataka          | 11831                              | 7683                               |
| 12      | Kerala             | 5574                               | 4338                               |
| 13      | Madhya Pradesh     | 36639                              | 27269                              |
| 14      | Maharashtra        | 50929                              | 38908                              |
| 15      | Manipur            | 913                                | 747                                |
| 16      | Meghalaya          | 824                                | 729                                |
| 17      | Mizoram            | 324                                | 215                                |
| 18      | Nagaland           | 365                                | 240                                |
| 19      | Odisha             | 15131                              | 13181                              |
| 20      | Punjab             | 10884                              | 7586                               |
| 21      | Rajasthan          | 20005                              | 16139                              |
| 22      | Sikkim             | 76                                 | 60                                 |
| 23      | Tamil Nadu         | 11549                              | 7549                               |
| 24      | Telangana          | 6229                               | 4271                               |
| 25      | Tripura            | 1432                               | 1245                               |
| 26      | Uttar Pradesh      | 106578                             | 83637                              |
| 27      | Uttarakhand        | 7855                               | 5775                               |
| 28      | West Bengal        | 20064                              | 17976                              |
|         | <b>State Total</b> | <b>436222</b>                      | <b>342659</b>                      |
| 1       | Andaman & Nicobar  | 55                                 | 33                                 |
| 2       | Chandigarh         | 100                                | 6                                  |
| 3       | Dadra & NH, D&D    | 66                                 | 44                                 |
| 4       | Delhi              | 3713                               | 216                                |
| 5       | Jammu & Kashmir    | 6326                               | 5230                               |
| 6       | Ladakh             | 75                                 | 66                                 |

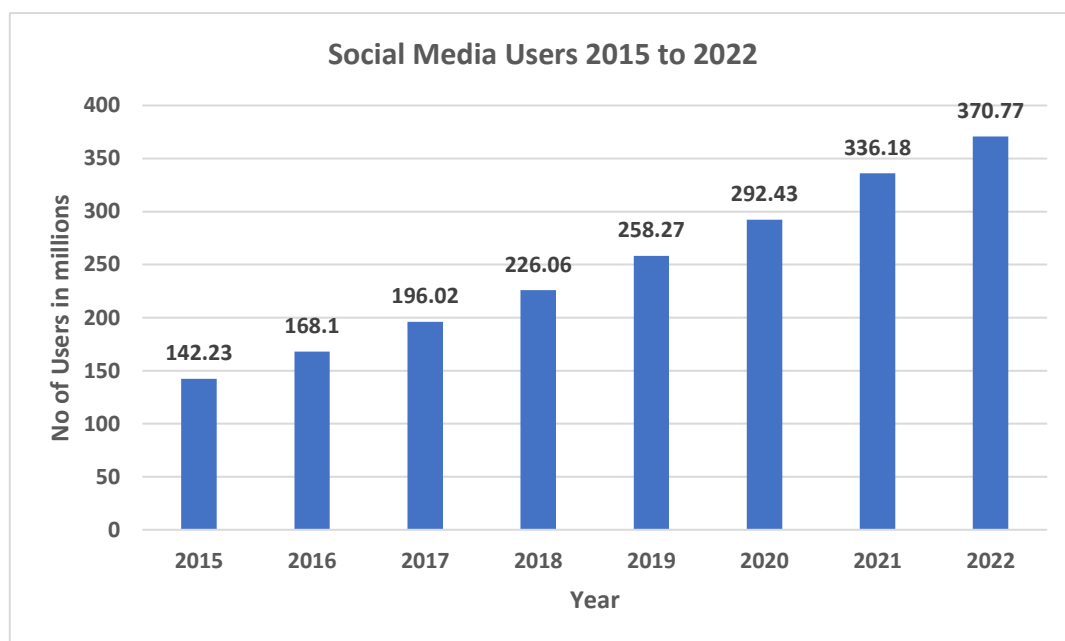
|   |                    |               |               |
|---|--------------------|---------------|---------------|
| 7 | Lakshadweep        | 14            | 14            |
| 8 | Puducherry         | 218           | 123           |
|   | <b>UT Total</b>    | <b>10567</b>  | <b>5732</b>   |
|   | <b>Grand Total</b> | <b>446789</b> | <b>348391</b> |

Source- Lok Sabha Unstarred question

<http://164.100.24.220/loksabhaquestions/annex/178/AU1156.pdf>

Table No. 3.3 shows the total number of common service centres in India and the function of CSC centres in urban and rural gram panchayat.

**Figure No 3.7: Social Media Users in India**



Source- Statista, 2022

Figure No 3.7 presents data on the social network users in India from 2015 to 2022. The number of users has gradually increased from 2015 to 2022. Facebook, Instagram, and WhatsApp are the main social networking sites that are used by the population of India.

### **ICTs based Rural Entrepreneurship**

CSC is envisaged as a single point for the citizen services from the government. The CSCs are initiated at every gram panchayat level to take governance close to people. The CSC is also seen as a means of providing employment to rural educated youth as the delivery of services through the CSC are charged a nominal fee. Setting up a CSC involves investment in computer, printer, internet, and power back-up, apart from the formal office set up in the busy centre in a

town. Therefore, the CSC has emerged as a business model that provides IT-enabled services to rural communities by leveraging the backbone of the government's CSCs scheme.

Rural Entrepreneurship of CSC business model helps to bridge the digital divide by providing digital access to services to people in rural areas. This business model provides an opportunity for rural entrepreneurs to become part of the digital revolution and gain access to the same opportunities available to people in urban areas. This business model can also generate employment for rural youth and promote entrepreneurship in rural areas. Rural entrepreneurship of CSC can be an effective tool to reduce rural-urban disparities by providing access to the same services that are available in urban areas. CSC provides various electronic services such as banking, health, social welfare, education, agriculture, and other government services to rural areas.

### **Digital Identity**

Digital identity in India refers to the unique digital representation of an individual's identity, often linked to their personal information, within the digital realm. In recent years, the Indian government has made significant efforts to promote digital identity through various initiatives, most notably the Aadhaar system.

Digital Identity of every Indian citizen is a scheme launched to provide a unique identification number using biometrics linked to digital storage and retrieval services. Aadhaar is a biometric identification system introduced by the Unique Identification Authority of India (UIDAI). It assigns a 12-digit unique identification number to residents based on their demographic and biometric data, including fingerprints and iris scans. Aadhaar is used for various purposes, such as accessing government services, financial transactions, and identity verification.

As part of the Digital India program, around 122 crore citizens and inhabitants of the nation have been enrolled. The unique identity is linked to different social welfare programmes in the initial phases and later extended to every citizen and almost every transaction with state and private services, including banking and government services.

Aadhaar is often used as a means to access government services and subsidies, such as welfare programs, healthcare benefits, and education services. Linking Aadhaar to these services helps streamline the process, reduce fraud, and ensure efficient delivery of benefits to eligible individuals. The widespread adoption of Aadhaar has raised concerns about privacy and

security. Critics argue that the collection and centralisation of biometric and personal data pose risks of identity theft, surveillance, and misuse (Lyon, 2003).

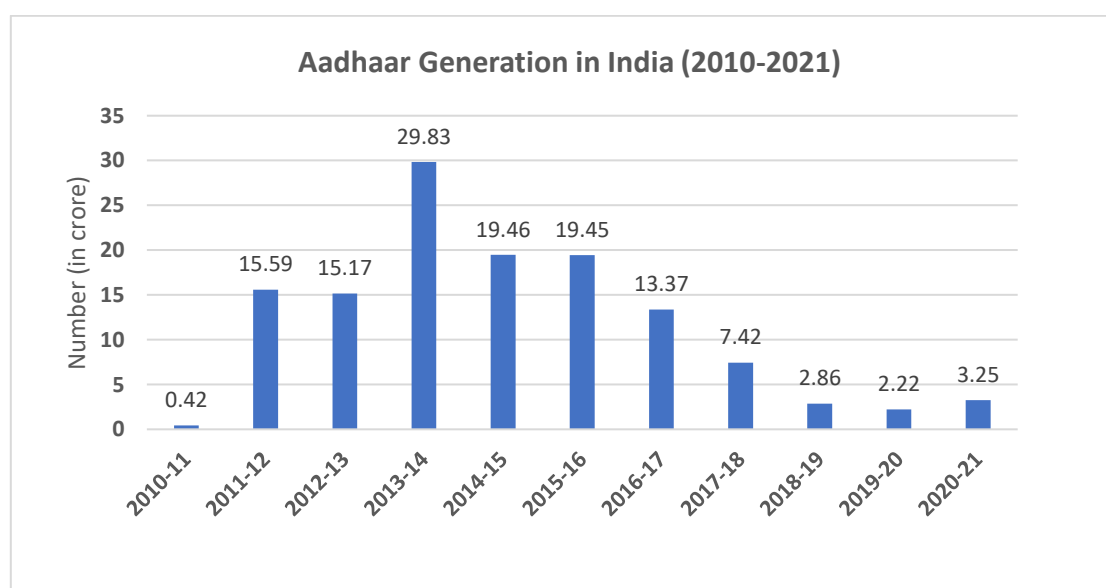
### Aadhaar in Rural Areas

Aadhaar has been integrated into various government services and welfare programs to ensure efficient service delivery and reduce fraud. In villages, residents can link their Aadhaar number to services like obtaining ration cards, accessing healthcare facilities and receiving social welfare benefits. Aadhaar helps streamlining the process, reduces intermediaries, and ensures that benefits reach the intended beneficiaries directly.

Aadhaar has played a crucial role in promoting financial inclusion in villages. With Aadhaar-linked bank accounts, residents can access financial services, receive government subsidies and payments directly, and engage in digital transactions. Aadhaar-enabled Payment Systems (AePS) have facilitated banking services and digital payments in areas with limited access to traditional banking infrastructure.

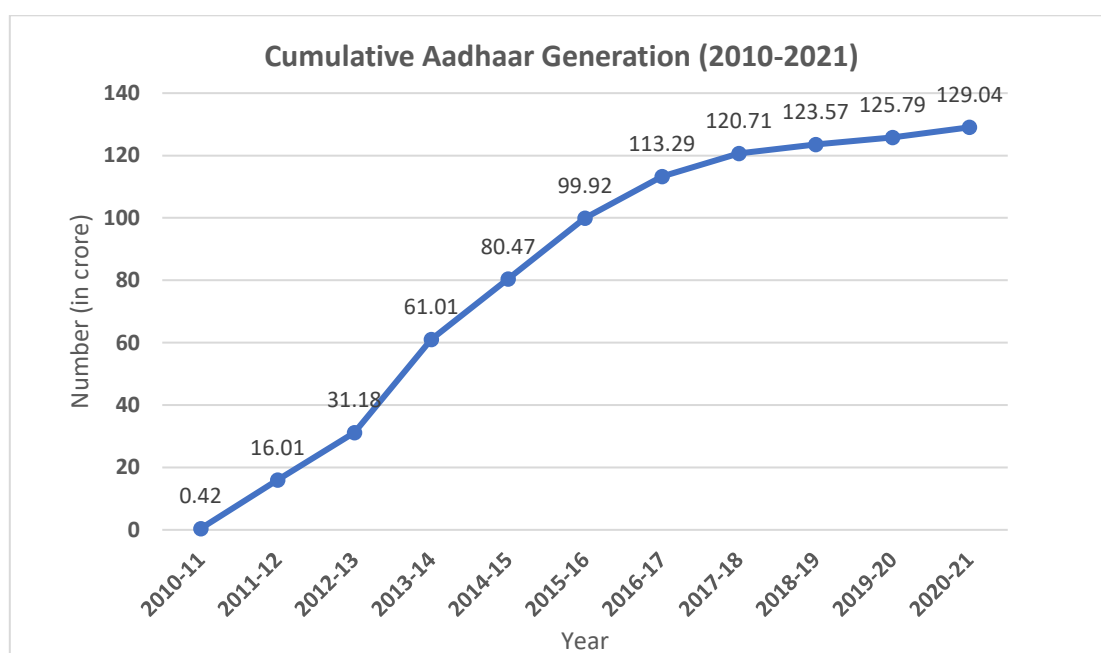
Aadhaar has been used for digitizing agricultural and rural development initiatives. For instance, the Direct Benefit Transfer (DBT) scheme leverages Aadhaar to transfer subsidies and benefits to farmers' bank accounts, eliminating intermediaries and reducing leakages. Aadhaar-enabled platforms have also been utilized for soil health card distribution, crop insurance, and agricultural loan disbursement, making processes more efficient and transparent.

**Figure No 3.8: Aadhaar Generation in India**



Source- UIDAI Annual Report 2021-22

**Figure No 3.9: Cumulative Aadhaar Generation in India**



Source- UIDAI Annual Report 2021-22

Figure No 3.8 and 3.9 show the year-wise data of Aadhaar generation and cumulative Aadhaar generation. There are 129.04 crore people who have registered with Aadhaar till 2020-21. Enrolment and updating services for Aadhaar are made available to citizens of India by the Unique Identification Authority of India (UIDAI), which operates more than 55,000 enrolment centres around the country. Additionally, UIDAI maintains 79 state-of-the-art Aadhaar Seva Kendras around the country, each of which provides citizens with an enabling environment. However, there have also been concerns about the security and privacy implications of Aadhaar, as well as issues around exclusion and access to services for those who do not have Aadhaar or whose biometric data does not match. These issues continue to be debated and addressed by the government and academicians (Derze et al., 2017, Khera, 2017).

Since its beginning UIDAI, it has been envisioned as a tool to enhance the administrative efficacy of assistance programmes by eliminating corruption and increasing participation. Contrary to these assertions, it has become a barrier to obtaining current advantages. Khera (2017) gives a taxonomy of Aadhaar-related difficulties, with a specific emphasis on circumstances in which it has been made essential, notably for collecting benefits from social programmes.

## **E-Governance initiatives across India**

E-Governance allows citizens to access government services and information quickly, easily, and securely. It also enables governments to collaborate and share data, resources, and expertise with other governments and organizations. E-Governance helps governments to reduce costs, increase efficiency, and improve public service delivery. It can also help governments to better engage with citizens, improve decision-making, and promote good governance.

Digital India programme launched by the Government of India to make India a digitally empowered nation. The program focuses on providing access to digital services, improving digital infrastructure, and encouraging digital literacy.

DigiLocker: It is a digital locker service that provides secure storage of digital documents issued by various government agencies. The service is linked to Aadhaar and provides easy access to digital documents, including driving licenses, PAN card and educational certificates.

The Direct Benefit Transfer (DBT) programme currently has 315 schemes operating across 53 ministries, all of which offer Aadhaar-enabled direct benefit transfer to individuals. With the DBT platform, a total of 24.3 million billion rupees have been transferred so far.

## ***Computerisation of Land Records***

The computerisation of land records is the process of converting manual land record-keeping systems into digital formats using computer software and hardware. In India, land records are essential documents for landowners, farmers, and the government to maintain a record of property ownership, land use, and land-related transactions. Computerisation of land records is crucial for ensuring efficient management and transparency of land records. The benefits of computerisation of land records in India are several. For example, it will help to reduce the time and cost involved in obtaining land-related information. With digitised land records, people can easily access information regarding land ownership, land use, and transactions without having to visit government offices. Also, that will help reduce corruption, dependency on middlemen, and fraudulent practices in land transactions. Digitisation of land records enables the detecting and preventing of fraudulent practices, such as illegal land grabbing and manipulation of land records. Computerisation of land records will create a reliable database of land ownership and land use patterns. This will help the state in planning and implementing various development projects, such as infrastructure, housing, and agricultural schemes. It will

also help in resolving land-related disputes more efficiently, reducing the burden on the judiciary.

The process involves digitising land records and creating a centralised database that is accessible to all stakeholders. This allows for faster retrieval and processing of land records, as well as improved accuracy and security. It also reduces the need for manual processes and paperwork, making land management more efficient. Computerisation of land records also allows for better tracking of land ownership, making it easier to trace illegal land transactions and disputes. The computerisation of land records in India is a long-term project that started in the 1980s. The National Land Records Modernisation Programme (NLRMP) was launched in 2008 to provide financial assistance to state governments for computerisation of land records. The programme aims to create a national land records database and streamline the process of land administration.

Karnataka was the first state in India to implement computerisation of land records in 2001. This was done as part of the 'Bhoomi' initiative, which aimed to make the management and maintenance of land records more efficient, transparent, and user-friendly by automating a number of the state's existing procedures. This e-governance initiative under NeGP started initially in ten states. It enables landowners to get ownership documents and Record of Rights (RoR) through online. In manual system the land records were maintained by village accountants who used maintain land records at will. Under the Bhoomi Project the Karnataka government could computerise the land records of 6.7 million farmers, and about 20 million rural records are available with 177 Government owned Kiskos. (<https://landrecords.karnataka.gov.in/>).

### ***Gyandoot***

Gyandoot is a rural e-governance initiative of the Government of Madhya Pradesh, launched in 2000. It is an innovative method of providing internet-based services to rural areas in the state. It aims to bridge the digital divide between urban and rural communities by giving rural people access to government services and information resources. Gyandoot uses a network of kiosks and telecenters that are connected to the central server in Bhopal. The services provided include application forms, government schemes, job opportunities, agricultural information and market prices of commodities. The project has been highly successful and has been replicated in other states.

## ***Mee Seva***

Mee Seva is an e-governance initiative launched in the undivided Andhra Pradesh. Mee Seva aims to provide a one-stop solution for all G2C and B2C services. Mee Seva is a revolutionary way of delivering government services to citizens aims at providing hassle-free, efficient, and transparent services. Mee Seva has brought about a significant change in the way services are delivered to citizens. It has eliminated the need for citizens to go to government offices to avail the services physically. The services are now available at the doorsteps of the citizens, thus making the process of availing the services much more convenient. Mee Seva also helped improve the government's overall public service delivery system. It simplified the process of availing the services and reduced the waiting times.

## ***CSC Kisan e-Mart***

The CSC Kisan e-Mart is an online platform in India that assists farmers in selling their produce through CSC. At the village level, entrepreneurs play the role of facilitators between farmers and market agents. Farmers will be added to the CSC Kisan e-Mart site by VLEs, along with the farmers' KYC details, and VLE will also add farmers' goods that are available for sale. Farmers can sell their produce directly to buyers through the portal using the bid process. VLE will be compensated with a commission for any verified stock or farmers that are added to the platform. The sum that the farmer earned from the sale of their produce will be deposited into his/her bank account. At the moment, this initiative is being carried out in the states of Maharashtra, Uttar Pradesh, Bihar, Himachal Pradesh and Tripura.

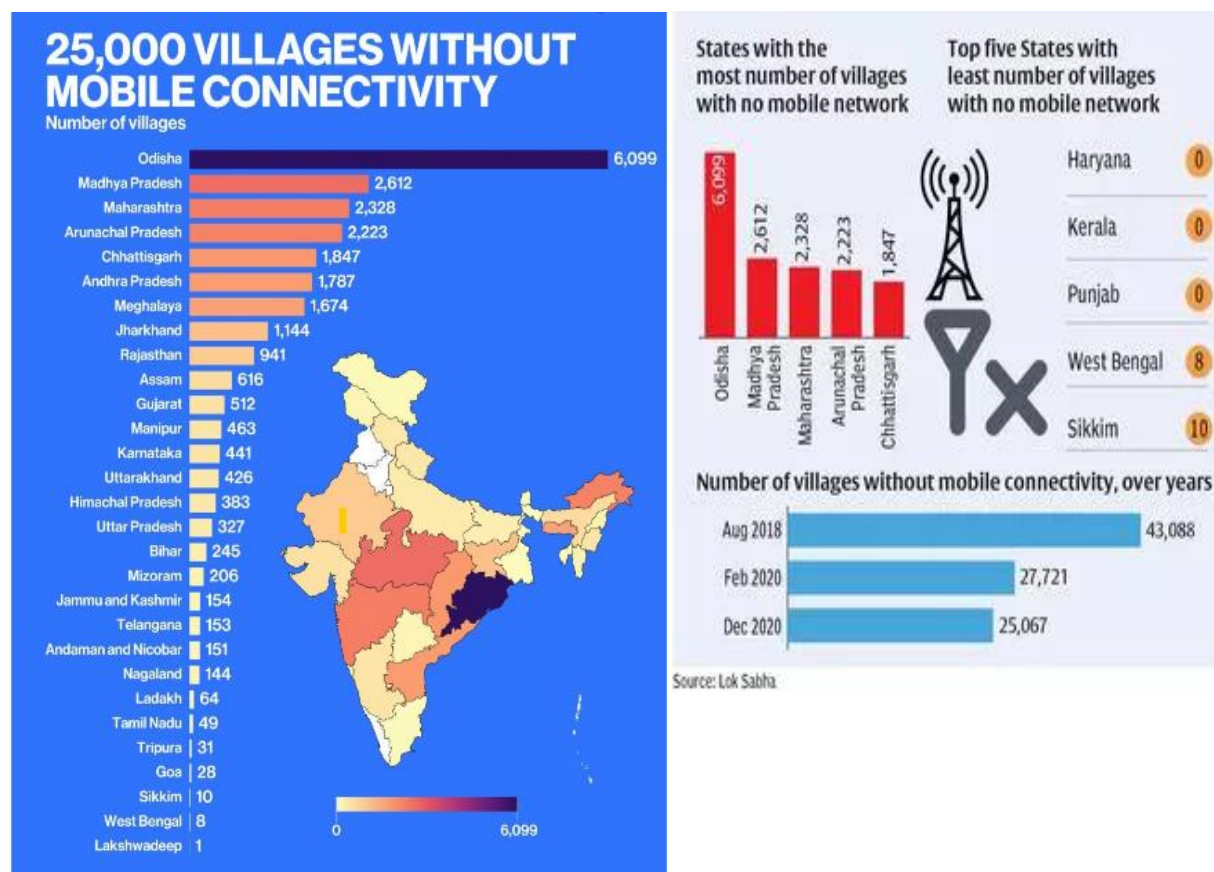
## **Digital Divide**

As per the Census 2011 data there are 5,97,618 inhabited villages in India. As on December 2020, according to the Ministry of Communication sources, there are, 25,067 villages which have not been covered with mobile network.

In Odisha, 6,099 villages do not have access to mobile and internet connectivity, which is highest in the country. 2,223 villages in Arunachal Pradesh, 2,612 villages in Madhya Pradesh, 2,328 villages in Maharashtra, 1,787 villages in Andhra Pradesh, and 1,144 villages in Jharkhand have no internet connectivity.

To provide mobile connectivity in unconnected villages and to make non-discriminatory access to ICTs services accessible to people in distant locations, the Universal Service Obligation Fund (USOF) scheme was introduced in 2002.

**Figure No. 3.10: Villages without Mobile Network**



Source: Ministry of Communication and Business Today, 2022

**Table No 3.4: Rural Mobile Connectivity in India**

| Sr. No. | State/UT                  | Total No. of inhabited villages as per Census 2011 | No. of inhabited villages with mobile connectivity as per 2020 | No. of uncovered villages |
|---------|---------------------------|----------------------------------------------------|----------------------------------------------------------------|---------------------------|
| 1       | Andaman & Nicobar Islands | 396                                                | 245                                                            | 151                       |
| 2       | Andhra Pradesh            | 16158                                              | 14371                                                          | 1787                      |
| 3       | Arunachal Pradesh         | 5258                                               | 3035                                                           | 2223                      |
| 4       | Assam                     | 25372                                              | 24756                                                          | 616                       |
| 5       | Bihar                     | 39073                                              | 38828                                                          | 245                       |
| 6       | Chandigarh                | 5                                                  | 5                                                              | 0                         |
| 7       | Chhattisgarh              | 19567                                              | 17720                                                          | 1847                      |

|    |                                      |               |               |              |
|----|--------------------------------------|---------------|---------------|--------------|
| 8  | Dadra & Nagar Haveli and Daman & Diu | 84            | 84            | 0            |
| 9  | Delhi                                | 103           | 103           | 0            |
| 10 | Goa                                  | 320           | 292           | 28           |
| 11 | Gujarat                              | 17843         | 17331         | 512          |
| 12 | Haryana                              | 6642          | 6642          | 0            |
| 13 | Himachal Pradesh                     | 17882         | 17499         | 383          |
| 14 | Jammu & Kashmir                      | 6101          | 5947          | 154          |
| 15 | Jharkhand                            | 29492         | 28348         | 1144         |
| 16 | Karnataka                            | 27397         | 26956         | 441          |
| 17 | Kerala                               | 1017          | 1017          | 0            |
| 18 | Ladakh                               | 236           | 172           | 64           |
| 19 | Lakshadweep                          | 6             | 5             | 1            |
| 20 | Madhya Pradesh                       | 51929         | 49317         | 2612         |
| 21 | Maharashtra                          | 40959         | 38631         | 2328         |
| 22 | Manipur                              | 2515          | 2052          | 463          |
| 23 | Meghalaya                            | 6459          | 4785          | 1674         |
| 24 | Mizoram                              | 704           | 498           | 206          |
| 25 | Nagaland                             | 1400          | 1256          | 144          |
| 26 | Odisha                               | 47677         | 41578         | 6099         |
| 27 | Punjab                               | 12168         | 12168         | 0            |
| 28 | Puducherry                           | 90            | 90            | 0            |
| 29 | Rajasthan                            | 43264         | 42323         | 941          |
| 30 | Sikkim                               | 425           | 415           | 10           |
| 31 | Tamil Nadu                           | 15049         | 15000         | 49           |
| 32 | Telangana                            | 10128         | 9975          | 153          |
| 33 | Tripura                              | 863           | 832           | 31           |
| 34 | Uttar Pradesh                        | 97813         | 97486         | 327          |
| 35 | Uttarakhand                          | 15745         | 15319         | 426          |
| 36 | West Bengal                          | 37478         | 37470         | 8            |
|    | <b>Total</b>                         | <b>597618</b> | <b>572551</b> | <b>25067</b> |

Source- Lok Sabha Question <http://164.100.24.220/loksabhaquestions/annex/175/AS310.pdf>

### ICTs led E-Governance Initiative in Odisha

Odisha has been making significant efforts to promote the use of ICTs and e-governance in the state. The state government launched several ICTs based initiatives to make government services accessible to citizens through digital means. The main aim of these initiatives is to improve the delivery of government services to citizens, promote transparency and accountability, and increase the efficiency and effectiveness of government operations.

The initiatives aim to create enabling environment for the development of ICTs infrastructure and services in the state. It also aims to facilitate the use of ICTs to develop state's economy and improve public service delivery. The initiatives focus on areas of e-Commerce, e-Education, e-Tourism, e-Health, e-Agriculture, and e-governance. The initiatives focus on

capacity building to ensure that the citizens of the state are well-equipped to use ICTs for their benefit.

### ***Odisha State Wide Area Network (OSWAN)***

OSWAN is an e-governance system established by the Government of Odisha to connect government offices and departments across the state. The network provides access to the internet and other communication services to government offices. Odisha government uses ICTs in education, health, rural and urban development.

### ***Student Academic Management System (SAMS)***

SAMS is an online portal developed and maintained by the Department of Higher Education of Government of Odisha. It is an integrated system led by ICTs that provides services such as registration of students seeking admission into higher educational institutions, examination management, and scholarship management. All the universities and colleges of the state are linked to SAMS, which enables students to access their academic records online. Also, 'Mo School Pogramme' connects schools with alumni students and teachers through social media platforms.

Prior to the service of SAMS students' admission process was manual, expensive, and time-consuming putting a lot of burden on the school and college authorities. Those students seeking admission in a particular needed to visit the school or college physically and apply for admission. The process of admission required at least three to four visits by the students and parents which was expensive and cumbersome. The ICTs led initiative enables the students to take admission sitting in their homes. The ICTs led online admission process is helping to the students to get the information in one web-based platform of SAMS. Now SAMS is available in the mobile app and it enables user to get information related to admission and apply for common application form. SAMS has covered more than 4000+ secondary school, colleges and institutions which has simplified more than six lakh application (<https://samsodisha.gov.in/>).

### ***e-Despatch***

e-Despatch is an online system of delivery of documents or parcels to the addressee electronically or through courier services in Odisha. It was developed by the Department of Information Technology, Government of Odisha. The system is designed to ensure speedy and secure delivery of documents. e-Despatch is a secure, reliable, affordable, and efficient way

for people to send documents, parcels, and other materials to their intended recipients. e-Despatch is a portal that can be accessed by any user on the internet, allowing users to easily send documents to their recipients. The portal also provides tracking information, allowing users to check and monitor the status of their documents. It is a digital platform enabling the state government to send and receive official correspondence digitally and reach the citizens. The platform aims to reduce the use of paper-based communication and improve efficiency in the government (<https://edodisha.gov.in/>).

### ***Telemedicine***

In the healthcare sector, the state government has implemented the e-Health program, which aims to provide better access to healthcare services using digital technologies. The program includes the establishment of telemedicine centers, which allow patients in remote areas to consult with doctors through video conferencing. Biometric identification is also used to ensure that patients receive the right treatment and to prevent fraud in healthcare schemes.

### ***e-Procurement***

The state government launched the e-Procurement platform to make procurement process transparent and efficient. The platform allows government departments to purchase goods and services online, which helps to reduce corruption and improve accountability.

### ***Bhulekh***

This portal is the website launched by the revenue department of Odisha, to provide online access to land records of the state. It is a web portal allowing people to view their land records, including ownership, area, and location. People can search for land records using the Bhulekh portal of Odisha by providing details such as district, tehsil, village, and khata number. They can also view maps of their land holdings, download and print records and make online payment of land-related fees. This portal is an initiative towards e-governance and transparency in the management of land records. It helps reduce time and effort required to obtain land records and minimizes the chances of fraud and corruption in land transactions. Bhulekh portal is an open-source website of revenue department of Odisha to check plot, khata and tenant details of land parcels.

**Table No 3.5: Statistics of Land Records in Odisha (as of March, 2023)**

| Sl. No. | State Statistics | Number   |
|---------|------------------|----------|
| 1       | Total district   | 30       |
| 2       | Tahasil          | 317      |
| 3       | RI Circles       | 2293     |
| 4       | Village          | 51727    |
| 5       | Khatiyans        | 18123011 |
| 6       | Plots            | 58025214 |
| 7       | Tenants          | 37365329 |

Source: Bhulekha <https://bhulekh.ori.nic.in/RoRView.aspx>

### ***Fair Price Shops (FPS)***

FPS are part of the public distribution system in India. It is a government run social welfare scheme that provides food grains to people living below the poverty line. The PDS aims to ensure that essential commodities, such as rice, wheat, sugar, and kerosene are made available to eligible households at affordable prices.

E-POS (Electronic Point of Sale) is a technology that has been introduced in many states in India, including Odisha, to make the distribution of food items more efficient and transparent. Under the e-POS system, each FPS is equipped with a device that records the sale of food items and issues a receipt to the beneficiary. The e-POS system also helps to eliminate instances of diversion and leakage of food items by ensuring that only eligible beneficiaries receive the allotted food items.

In Odisha, the government has implemented the e-POS system in PDS since 2013, and it has helped to improve the functioning of the PDS and ensure the timely delivery of essential commodities to the needy people.

**Table No. 3.6: Fair Price Shops/e-PoS in Odisha**

| Sl. No. | FPS handled by        | Number of FPS by 2023 |
|---------|-----------------------|-----------------------|
| 1       | Cooperative Societies | 5,449                 |
| 2       | Under Panchayat       | 4,041                 |
| 3       | Self-help group       | 2,210                 |
| 4       | Individual            | 256                   |
| 5       | Other FPS             | 68                    |
|         | Total                 | 12,024                |

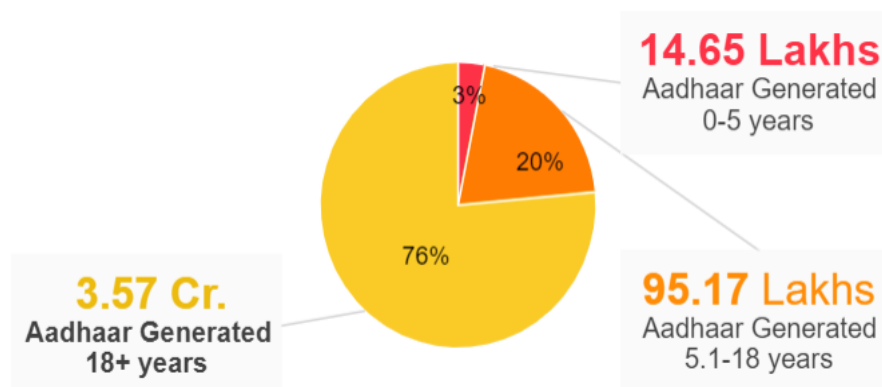
Source: NFSA Odisha <https://nfsa.gov.in/State/OR>

**Figure No. 3.11: Digital Identity (Aadhaar Generations in Odisha)**

Total Population- 4.49 crores

Total Aadhaar Generated: 4.67 crores

Aadhaar Generations: 103.84 percent



Source: Dashboard, Aadhaar Generation, Electronics & Information Technology Department, Govt. of Odisha

<https://statedashboard.odisha.gov.in/Dashboard/AnalyticDashboard?enc=aQBkAD0AMgAyAA%3D%3D&Language=E>

The introduction of ICTs in villages of Odisha has significantly impacted the implementation of social welfare schemes. The state government has launched several initiatives to provide access to ICTs tools and services in rural areas, which has helped to improve social welfare schemes and benefits to the rural population. One of the key initiatives is the CSC scheme, which aims to deliver digital services to citizens in rural areas. Under this scheme, CSCs have been established in several villages across the state, providing a range of services such as digital literacy, online payment of bills, and access to government schemes and services such as land records, birth, caste, resident, and income certificate.

In the field of education, the state government has introduced several ICTs-based programs to improve access to education and enhance learning outcomes. These initiatives include the provision of laptops to students, developing digital classrooms, and using e-learning platforms to deliver education remotely and introducing a common digital platform of student accreditation management system SAMS. In the healthcare sector, technology has greatly improved medical treatment and access. The state has introduced telemedicine services that enable patients in remote areas to receive medical advice and treatment from doctors located

elsewhere. In agriculture, ICTs has helped farmers to improve productivity and profitability. The state has launched several initiatives to promote the use of ICTs in agriculture, including the development of mobile applications that provide farmers with real-time information on weather, crop prices, and other relevant information.

The role of ICTs in Odisha has been significant in driving economic development and improving the quality of life for its citizens. The state government has recognised the importance of ICTs and is committed to continuing to invest in this area to further enhance the state's growth and development.

One of the key initiatives is the common service centre scheme, which aims to deliver digital services to citizens in rural areas. Under this scheme, CSCs have been established in several villages across the state, providing a range of services such as digital literacy, online payment of bills, and access to government schemes and services. The CSCs have played a decisive role in improving the implementation of social welfare schemes in rural areas. For example, MGNREGA provides employment opportunities to rural households, and the CSCs have been instrumental in ensuring that the benefits of the scheme reach the intended beneficiaries through direct benefit transfer and receive wages using biometric based authentication. The CSCs have also helped in the implementation of other social welfare schemes such as the Pradhan Mantri Awas Yojana and pension scheme.

Through the CSCs, rural households have been able to access information about these schemes, apply online, and receive benefits such as housing and financial assistance through direct benefit transfer. In addition to the CSCs, the state government has also launched several other initiatives to promote the use of ICTs in social welfare schemes. These include the development of mobile applications that provide information about government schemes and services, and the use of Aadhaar-based authentication to ensure that benefits are delivered to the intended beneficiaries.

The introduction of ICTs in villages of Odisha has been instrumental in improving the implementation of social welfare schemes and ensuring that the benefits of these schemes reach the rural population. The state government's commitment to promoting the use of ICTs in social welfare schemes has been a significant step towards achieving inclusive growth and development in rural areas.

## **Role of ICTs in Rural Areas**

The role of ICTs in villages has been crucial in promoting economic growth, improving access to information and services, and enhancing the quality of life for the rural population. Here are a few examples of how ICTs has played a role in villages:

**Digital Financial Inclusion:** ICTs has enabled the development of digital payment systems that allow people in villages to access financial services more easily. For example, the Jan Dhan Yojana scheme launched by the government of India has helped to open bank accounts for millions of people in rural areas. These accounts can be accessed using mobile phones and internet banking allowing villagers to transfer and receive money easily.

**E-Governance:** ICTs has also played a crucial role in improving access to government services and schemes in villages. Many state governments in India have implemented e-governance initiatives that allow villagers to access government services through online portals. For example, the ePanchayat initiative launched in Odisha provides a range of services to villagers such as birth and death certificates, and other documents through online portals.

**Agriculture:** ICTs has been instrumental in promoting precision agriculture, which helps farmers to optimize their yields and reduce wastage. For example, the Kisan Suvidha app launched by the government of India provides farmers with real-time information about weather, crop prices, and other relevant data. Similarly, the e-Krishi app launched in Odisha provides farmers with information about crop management, soil testing, and pest management.

**Education:** ICTs has also played a crucial role in improving access to education in villages. Many state governments in India have launched initiatives that provide digital classrooms, e-learning platforms, and online courses. PMGDisha, PM eVidya are the online platforms which help students.

**Common Service Centres (CSC):** It is an e-governance initiative of the government of India launched with an aim to provide government services at the village level using ICTs. As per the government of India web sources, the idea of CSC was conceived as a one stop facility to avail a range of services offered by the government to its citizens. It was launched as part of the National e-Governance Plan of 2006. The CSCs are the access points for delivery of government to citizen (G2C) e-services within the reach of citizens in the most transparent way (<http://csc.gov.in>). There are 19 CSCs working in Ersama block, Jagatsinghpur (<https://jagatsinghpur.nic.in/>).

**Table No 3.7: CSC Centres in Ersama Block and VLEs**

| Sl. No | Ersman block (Gram Panchayat Name) | VLE Name              |
|--------|------------------------------------|-----------------------|
| 1      | Gadaharishpur                      | Kapil Kumar Das       |
| 2      | Gadabisunpur                       | Dipti Ranjan Guru     |
| 3      | Pokhariapada                       | Mitalin Swain         |
| 4      | Nardia                             | Ambika Mishra         |
| 5      | Paida                              | Chittaranjan Nayak    |
| 6      | Kothi                              | Pradipta Kumar Sahoo  |
| 7      | Ersama                             | Ranjan Kumar Swain    |
| 8      | Japa                               | Hemanta Kumar Behera  |
| 9      | Ambiki                             | Kalipada Giri         |
| 10     | Padmapur                           | Priyabrata Mohanty    |
| 11     | Bamadeipur                         | Sudarsan Rout         |
| 12     | Janakadeipur                       | Pagan Pallei          |
| 13     | Dhinkia                            | Ranjan Kumar Mohanty  |
| 14     | Bhitar andhari                     | Prabhudatta Pradhan   |
| 15     | Goda                               | Santosh Kumar Sahoo   |
| 16     | Kunjakothi                         | Rajendra Kumar Khatua |
| 17     | Balitutha                          | Pratap Kumar Patra    |
| 18     | Pallikanta                         | Jitendra Kumar Bhol   |
| 19     | Jirailo                            | Babaji Charan Nayak   |

Source- NIC Jagatsinghpur and Field work data

There are two CSCs working in Ersama and Dhinkia panchayat.

Similar initiative is also found in fair price shop digitization. The government of Odisha began earnestly bringing the FPS under the ICTs based initiative fold for a better administration of food grain distribution in the state. A total of 113 fair price shops are registered under National Food Security Act (NFSA) in Ersama block.

**Table No 3.8: Beneficiaries under NFSA and Fair Price Shops in Odisha**

| Sl. No. | No. of District of Odisha | Population as per 2011 Census | Target Beneficiaries covered under NFSA | No of Fair Price Shop (FPS) or e-POS (2020) |
|---------|---------------------------|-------------------------------|-----------------------------------------|---------------------------------------------|
| 1       | Angul                     | 1273821                       | 992171                                  | 1085                                        |
| 2       | Balasore                  | 2320529                       | 1839909                                 | 1638                                        |
| 3       | Bargarh                   | 1481255                       | 1177518                                 | 1402                                        |
| 4       | Bhadrak                   | 1506337                       | 112926                                  | 825                                         |
| 5       | Bolangir                  | 1648997                       | 1302872                                 | 1737                                        |
| 6       | Boudh                     | 441162                        | 357111                                  | 158                                         |
| 7       | Cuttack                   | 2624470                       | 1864100                                 | 1527                                        |

|    |               |          |          |       |
|----|---------------|----------|----------|-------|
| 8  | Deogarh       | 312520   | 263431   | 328   |
| 9  | Dhenkanal     | 1192811  | 949111   | 641   |
| 10 | Gajapati      | 577817   | 478943   | 661   |
| 11 | Ganjam        | 3529031  | 2562200  | 2126  |
| 12 | Jagatsinghpur | 1136971  | 858449   | 993   |
| 13 | Jajpur        | 1827192  | 1465738  | 1100  |
| 14 | Jharsuguda    | 579505   | 415152   | 510   |
| 15 | Kalahandi     | 1576869  | 1263509  | 880   |
| 16 | Kandhmal      | 733110   | 612481   | 490   |
| 17 | Kendrapara    | 1440361  | 1103417  | 653   |
| 18 | Keonjhar      | 1801733  | 1484306  | 646   |
| 19 | Khurda        | 2251673  | 1485743  | 1223  |
| 20 | Koraput       | 1379647  | 1127645  | 1317  |
| 21 | Malkangiri    | 613192   | 515324   | 513   |
| 22 | Mayurbhanj    | 2519738  | 2120521  | 2071  |
| 23 | Nabarangpur   | 1220946  | 1029124  | 771   |
| 24 | Nayagarh      | 962789   | 731569   | 344   |
| 25 | Nuapara       | 610382   | 492561   | 321   |
| 26 | Puri          | 1698730  | 1259610  | 1459  |
| 27 | Rayagada      | 967911   | 794306   | 375   |
| 28 | Sambalpur     | 1041099  | 812841   | 438   |
| 29 | Sonepur       | 610183   | 488203   | 133   |
| 30 | Sundergarh    | 2093437  | 1601586  | 1691  |
|    | Total         | 41974218 | 32578820 | 28058 |

Source- [http://www.foododisha.in/Download/NFSA\\_Brochure.pdf](http://www.foododisha.in/Download/NFSA_Brochure.pdf) (e-Bitaran Odisha, 2015)

## Mapping Digital Technology

Digital technology in India is rapidly growing, and the country is making great strides in advancing its digital infrastructure. India is now focusing on developing its digital infrastructure to provide access to public services and enable businesses to leverage digital technologies to improve operational efficiencies. India has taken several initiatives to promote the use of digital technology in the country.

The Digital India program of the government of India is a major programme, which made digital infrastructure in the same category of public goods as road network and electricity supply. Under this, thrust is laid on introducing more broadband cables, make more Wi-Fi hotspots, and more for commercial data exchange as the opportunity to free spectrum. Rural-urban divisions often define India's development paradigm.

The current technological paradigm in ICTs in India is focused on three main aspects: digitalisation, connectivity, and analytics. Digitalisation involves leveraging technological advancements to digitise processes and operations to gain efficiency, reduce costs and improve

customer experiences. Connectivity is about developing the infrastructure for seamless and secure transmission of data and information. Analytics is about leveraging data and insights to drive decision-making and develop business models. All these aspects are being implemented to enable a digital transformation that will boost economic progress, lead to the creation of jobs, and make a positive impact on the citizens' quality of life.

## **Conclusion**

ICTs are widely used in many areas today, from business, industry, health education, entertainment and politics. The use of ICTs has been growing rapidly in recent years, and it is important to understand the implications of these technologies for society. While looking at the ICTs from a sociological lens it is important to consider the broader context in which they are used. This includes understanding the policy and practices that influence their adoption and use, and the technologies' impact on existing social structures. It is also critical to evaluate the implications of ICTs use for privacy and security and their ability to produce new forms of equality and inequality. The integration of ICTs in a socio-technical paradigm has significant implications for both policy and practice. The use of ICTs in this context requires a nuanced understanding of the interplay between technology, society, and culture, and how they shape and are shaped by each other.

It is crucial to analyse numerous actors engaged and their responsibilities when examining the policy and practises that influence the use of ICTs. Governments, for example, which play a role in regulating the use of ICTs and in encouraging their adoption policies related to the use of ICTs, must take into account the broader socio-technical context and the potential impact on individuals, communities, and society as a whole. This requires a collaborative approach involving various stakeholders, including government, industry, civil society, and academia. At the same time, practitioners need to be aware of the potential unintended consequences of ICTs use in a socio-technical paradigm. They need to consider issues such as digital divides, privacy, security, and the impact on social relationships and norms.

## **CHAPTER 4**

### **‘NETWORKED’ VILLAGES: SOCIAL CONSTRUCTION OF E- GOVERNANCE INITIATIVES IN RURAL ODISHA**

E-governance has emerged as an important tool for the welfare state to reach out to the poorer sections of the population. In India, the central government initiated the e-governance project providing technical support to the state governments for its intense implementation. The thrust of the e-governance initiative is to reach out to the needy citizen in the remotest corner of the country. National e-Governance Plan (NeGP) mission is the launch pad for the e-governance initiative.

The implementation of the initiative is the responsibility of the states. Each state has launched the e-governance-based administration under its own preferred name. The names of the initiatives may vary, but the spirit of the initiative is the same across the country. Similarly, the extent of implementation and reach of the programme vary across states. One state where the e-governance initiative was launched with all seriousness is Odisha. This chapter presents the data collected on e-governance initiatives in Odisha. The previous two chapters, chapter two and three, dealt with the academic discourse on ICTs and related policies, and this chapter and the following one will discuss the empirical findings of the study.

This chapter focuses on exploring how the ‘rural’ is brought into the ‘network’ through ICTs-based e-governance initiatives by the state. It explores how technology is operationalised in the everyday social lives of people in villages and the likely impact on the village social structure. It presents the empirical data collected from the field from the respondents on their perceptions of ICTs services through e-governance. It attempts to understand the concept of ICTs and e-governance from the citizen’s point of view; how ICTs helps restructure the social order, and how ICTs is negotiated in the existing rural social milieu characterized by social, cultural, political, and economic inequalities.

A detailed demographic information and socio-economic profile of the respondents, and the profile of ICTs centres is presented in this chapter. It further analyses the nature of accessibility of ICTs to citizens and the nature of social negotiation with technology. The negotiations and mediations by people with digital technologies and the meanings attached and derived are creating a new ‘Information Age’ in rural India. The chapter analyses how users in the villages access ICTs and how the process of negotiation takes place in their everyday life. Thus, the

analysis positions itself within the intersections of gender, class, and caste. This chapter is divided into three broad sections. The first section explains the profile of the village and the selected sample. The second section presents the profile of the respondents, including the demographic data, while the third section explains the narratives from the field.

### **Section A: Profile of the field site**

The study was conducted in two villages, Dinkia and Ersama of Jagatsinghpur district. There are 527 households residing in Ersama village. The village is 45 kilometres away from the district headquarter and 98 kilometres from the state capital Bhubaneswar. The total population of the village is 2,317, out of which 1,153 are men and 1,164 are women. The scheduled caste population is 892 (men 458 and women 434) which constitute about 39.82 percent of the total population. The literacy rate in the village is 84.07 percent which is higher than the state literacy rate (72.09 percent).

Dinkia is a village in the block of Ersama in the district of Jagatsinghpur. It is about 43 kilometers away from the district headquarters and 95 kilometers far from the state capital, Bhubaneswar. There are 832 households residing in the village. The total population of the village is 4,141 out of which 2,114 are men and 2,027 are women. The scheduled caste population is 1,649 (men 831 and women 818). The total literacy rate in the village is 76.8 percent.

**Table No 4.1: Details of the Field Sites**

| Demographic Details                          | Field Site – Villages |               |
|----------------------------------------------|-----------------------|---------------|
|                                              | Ersama                | Dinkia        |
| Distance from the district headquarters      | 45 kilometres         | 43 kilometres |
| Distance from the state capital, Bhubaneswar | 98 kilometres         | 89 kilometres |
| No. of households                            | 527                   | 832           |
| Total population                             | 2,317                 | 4,141         |
| Men                                          | 1,153                 | 2,114         |
| Women                                        | 1,164                 | 2,027         |
| Literacy rate                                | 84.07%                | 76.08%        |

Source: Census 2011 and Field Study

The social structure in the study villages is almost the same. Both the villages consist households belonging to different castes, classes and religions. A large majority of the households belong to Hindu religion. Most people are engaged in their caste-based occupations, and some have migrated to the other states in search of livelihood opportunities. The majority households of Dhinkia and Ersama villages have pukka houses and have all weather internal roads. Both the villages have a cluster of houses and huts, surrounded by fields all around. The two villages are characterised by a complex web of social relationships based on kinship, caste, gender, and community ties. The main source of income for the households is from the *Dhana* (Paddy), *Pana* (Betel) and *Mina* (Fish) cultivation. Sunadia, Patana, Nuagaon, Balitutha, Trilochanpur, Gadakujanga, Noliasahi, and Govindpur are the surrounding villages of Dhinkia. Ambiki, Siha, Jireilo, Manikundal, and Chadheikuda are the surrounding villages of Ersama.

### **Profile of Dhinkia and Ersama villages**

Dhinkia and Ersama villages are located in the Ersama block of Jagatsinghpur district of the state of Odisha in India. The socio-economic profile of Dhinkia and Ersama villages are explained using the indicators such as population, literacy rates, occupation, infrastructure and access to basic services. The details are described in the table no 4.1, however agriculture forms the backbone of the village's economy. The fertile soil allows for the cultivation of rice, pulses, and vegetables along with betel vine. The livelihood of the inhabitants is reliant on the rearing of cattle, goats, and poultry. Fishing also contributes significantly to the local economy, with villagers engaged in both marine and freshwater fishing activities. A few small-scale industries, such as handloom weaving and pottery, provide additional income opportunities. The income distribution is relatively equitable, with most families belonging to the middle-income category.

The villages are connected to nearby panchayats and block through well-maintained roads. Electricity is available to most households, although there are power cuts during peak demand. Drinking water is sourced from tube wells and hand pumps. Sanitation facilities are gradually improving, however open defecation is still common in villages due to a lack of sufficient toilet facilities. People would often relieve themselves in fields, forests, or open areas near water bodies.

The local economy is based on a combination of the production of paddy, betel vine, and fish, which have been the backbone of the community for many generations, intertwined with the

local culture, religion, and nature. Popularly known as *Dhana-Pana-Mina*, Paddy, Betel vine and Fish are the primary sources of livelihood for all the inhabitants of the two villages. For generations, the locals have relied on these for their livelihood. Most of the families generate income from these three sources, ensuring their health and well-being. For the villagers, *Pana* means *paisa* (money), which satisfies their cash requirements; while '*Dhana*' and '*Mina*' provide them with nutrition and protein.

Betel cultivation is gaining relevance as the local economy becomes more intertwined with the widening of the economy characterised by the rising demand for cash. As a result, farmers are devoting more land to betel cultivation in order to generate cash by selling betel leaves in the local market. This fulfils their regular money needs as betel leaves can be marketed throughout the year. The phrase, "*pana chasha heuchi tanka chasha*" (betel, it is a cultivation of money) aptly describes the role of betel vine cultivation in the villages. Betel is a delicate vine, and mismanagement of the crop can seriously affect farmers' earnings. Hence, farmers carefully nurture and take care of the betel vine during all stages of growth. Extensive care is provided from the planting stage to the harvesting stage.

In the context of information and communication technologies in the village of Jagatsinghpur in the early 1990s, Dhinkia and Ersama did not have a single phone or any other modern communication means. Electricity was also a dream for the people in the aftermath of super cyclone 1999 in Ersama block. Today twenty-four years have passed since the super cyclone destroyed the coastal district of Jagatsinghpur. However, the Ersama block, which was affected the most, currently portrays a picture of tranquillity and beauty and bears no external evidence of the disastrous impact of that event. The beautiful environment is further enhanced by patches of Casuarina plantations, lush green paddy fields, and prawn-culture ponds. Presently, both the villages are well connected with access to the internet, road, and electricity.

In the contemporary age, ICTs have improved governance and public service delivery in rural areas. Digital platforms and e-government initiatives enable villagers to access government services, information, and resources more conveniently. ICTs enable communication technology and the exchange of information between individuals, society, and organisation. ICTs have been embedded into the villages of Odisha through e-governance processes. The first tier of the e-Governance plan is the Common Service Centre, which is the front-end delivery point and provides affordable, transparent services to citizens. State-Wide Area Networks and State Data centres are the second tiers. It supports state-level low-level networks, e-office links

blocks to the district and distributes ICTs services. The villages have two CSC centres where the villagers avail all the e-governance services.

The social structure of a typical village today has changed from television to computer/laptop and feature phones to smartphones. The evolution of smartphones and ICTs has brought about a paradigm shift in communication and the approach of citizens to technology. It has transformed how citizens communicate, access information, participate in public discourse, and engage with essential services. This transformation has significantly impacted various aspects of society and individuals' lives. The widespread availability of smartphones and ICTs advancements have empowered individuals, fostered connectivity, and contributed to societal changes in various domains. However, addressing challenges such as the digital divide, data privacy, and digital literacy is important to ensure equitable access and to maximise the benefits of mobile technology and ICTs for all citizens.

## **Section B: Profile of the Respondents**

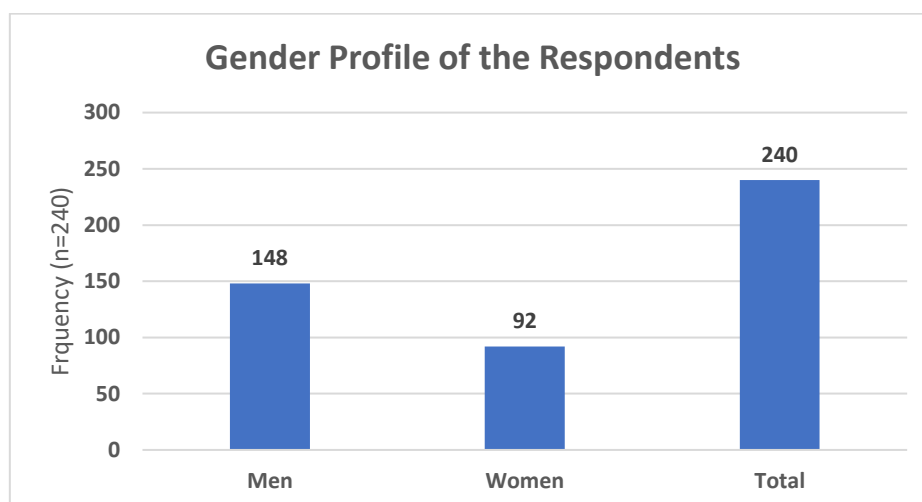
Social profile of the respondents provides insights into the diverse social factors that influence their perspectives, experiences, and engagement with ICTs and governance. It highlights the importance of considering social context and power dynamics in analysing the relationship between technology and society.

**Table No 4.2: Gender Profile of the Respondents**

| <b>Gender</b> | <b>No. of Respondents</b> | <b>Percent</b> |
|---------------|---------------------------|----------------|
| Men           | 148                       | 61.66          |
| Women         | 92                        | 38.33          |
| Total         | 240                       | 100            |

Table 4.2 and figure 4.1 presents the gender distribution of respondents. Out of a total of 240 respondents 148 are men and 92 are women.

**Figure No 4.1: Gender Profile of the Respondents**



## Age

The age of the respondents collected from the two villages. The respondents age is divided in to four categories i.e., 18 to 30 years, 31 to 40 years, 41 to 50 years and above 51 years.

**Table No 4.3: Age Profile of the Respondents**

| Age                | No. of respondents | Percent |
|--------------------|--------------------|---------|
| 18-30 years        | 18                 | 7.5     |
| 31 to 40 years     | 94                 | 39.2    |
| 41 to 50 years     | 99                 | 41.3    |
| 51 years and above | 29                 | 12.1    |
| Total              | 240                | 100     |

**Figure No 4.2: Age Profile of the Respondents**

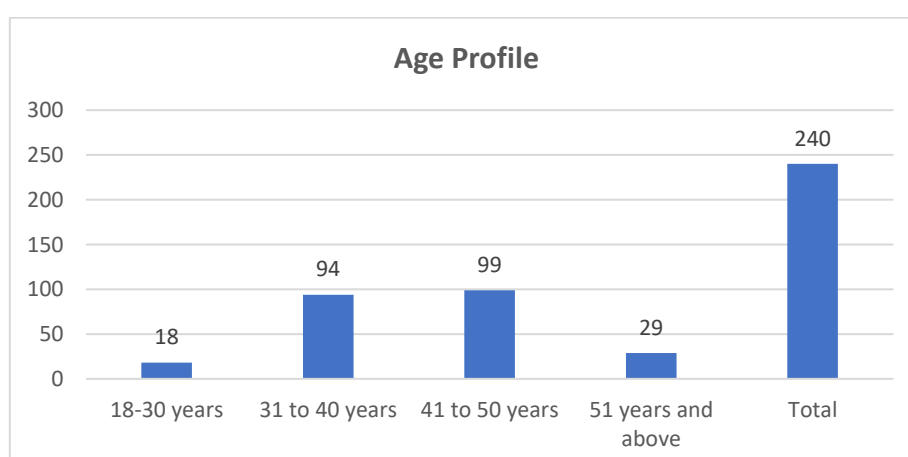


Table 4.3 and figure 4.2 presents data on age profile of the respondents. Majority of the respondents (99 out of 240), 41 percent, are in the age group of 41 to 50 years. 94 respondents are in the category of 31 to 40 years of age, 29 are above 51 years age category and 18 respondents are in 18 to 30 years age category.

### **Age and Gender**

With regard to gender and age, data suggests that out of 240 respondents 148 are men and 92 are women. There are 63 men and 36 women respondents in the age group of 41 to 50 years and 57 men and 37 women respondents are in the age group of 31 to 40 years. In the age group of 18 to 30 years there are 13 men and 5 women and in 51 years and above age group category, there are 15 men and 14 women.

**Table No. 4.4: Age and Gender Profile of the Respondents**

| <b>Age</b>         | <b>No. of Respondents</b> |              |              |
|--------------------|---------------------------|--------------|--------------|
|                    | <b>Men</b>                | <b>Women</b> | <b>Total</b> |
| 18-30 years        | 13                        | 5            | 18           |
| 31 to 40 years     | 57                        | 37           | 94           |
| 41 to 50 years     | 63                        | 36           | 99           |
| 51 years and above | 15                        | 14           | 29           |
| 18-30 years        | 148                       | 92           | 240          |
| Total              | 148                       | 92           | 240          |

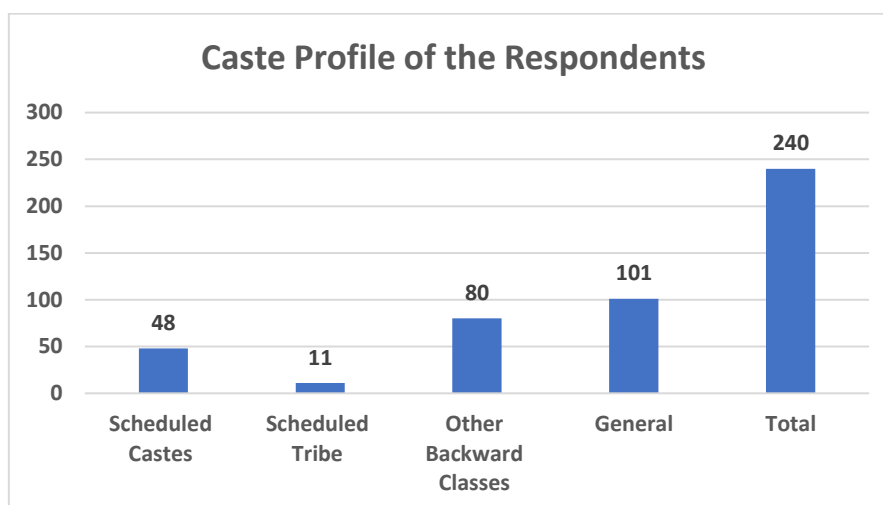
### **Caste**

The respondents of the study belong to four broad caste categories, namely Scheduled Castes (SCs), Scheduled Tribe (STs), Other Backward Classes (OBCs) and General.

**Table No 4.5: Caste Profile of the Respondents**

| <b>Caste</b>         | <b>No. of Respondents</b> | <b>Percent</b> |
|----------------------|---------------------------|----------------|
| Scheduled Caste      | 48                        | 20.0           |
| Scheduled Tribe      | 11                        | 4.6            |
| Other Backward Class | 80                        | 33.3           |
| General              | 101                       | 42.1           |
| Total                | 240                       | 100            |

**Figure No 4.3: Caste Profile of the Respondents**



Out of 240 respondents 48 belong to SC category, 11 respondents belong to ST category, 80 respondents (about 33 percent) belong to the OBC category and 101 respondents (about 42 percent) belong to the general category.

**Table No 4.6: Gender and Caste Profile of the Respondents**

| Gender and Caste of the Respondents |        |       |       |
|-------------------------------------|--------|-------|-------|
| Caste                               | Gender |       | Total |
|                                     | Men    | Women |       |
| SC                                  | 32     | 16    | 48    |
| ST                                  | 8      | 3     | 11    |
| OBC                                 | 43     | 37    | 80    |
| General                             | 65     | 36    | 101   |
| Total                               | 148    | 92    | 240   |

Out of 101 respondents belonging to the general category 36 are women. Among the OBC category, women respondents are 37 (out of 80 respondents); and there are 16 women respondents from the SC category (out of 32 respondents under this category) and three out of eight women respondents are under the ST category.

### **Educational Profile of the Respondents**

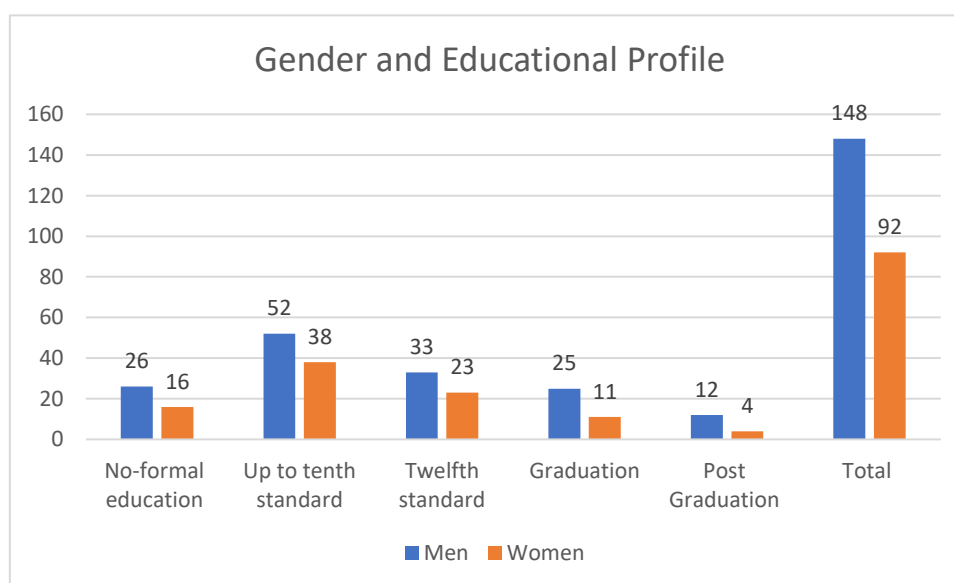
In the Dhinkia and Ersama villages there are three schools (one high school and two upper primary schools) serving the educational needs of the villagers. There is only one college

named Jagannath Mahavidyalaya for higher education at Ersama block where education is provided up to twelfth class.

**Table No 4.7: Gender and Educational Qualification of the Respondents**

| Educational level    | Gender of the Respondents |       | Total (Percent) |
|----------------------|---------------------------|-------|-----------------|
|                      | Men                       | Women |                 |
| No-formal education  | 26                        | 16    | 42 (17.5)       |
| Up to tenth standard | 52                        | 38    | 90 (37.5)       |
| Twelfth standard     | 33                        | 23    | 56 (23.4)       |
| Graduation           | 25                        | 11    | 36 (15.0)       |
| Post Graduation      | 12                        | 4     | 16 (6.6)        |
| Total                | 148                       | 92    | 240 (100)       |

**Figure No 4.4: Gender and Educational Qualification of the Respondents**



The respondents are categorised on the basis of education ranging from no-formal education to postgraduation. Out of 240 respondents 42 have no formal education from which 26 are men and 16 are women. Among the 90 respondents (about 38 percent) who have completed matriculation examination of the Board of Secondary Education Odisha, 38 are women. Out of 56 respondents (about 23.3 percent) who have completed twelfth standard education, 23 are women. Eleven respondents out of 36 (about 15 percent) who have completed graduation are women while four out of 16 respondents (about 7 percent) who completed post-graduation are women.

## Occupational Profile of the Respondents

In the villages Dhinkia and Ersama the primary occupation of the residents is cultivation of paddy and betel leaf. Few households from the *Keuta* caste are engaged in fishing. In these villages every second household has a betel vineyard in their house.

**Table No 4.8: Occupational Profile of the Respondents**

| Occupation                            | No. of Respondents | Percent |
|---------------------------------------|--------------------|---------|
| Government service                    | 17                 | 7.1     |
| Business                              | 32                 | 13.3    |
| Wage labour                           | 34                 | 14.2    |
| Agriculture                           | 104                | 43.3    |
| Student                               | 19                 | 7.9     |
| Homemakers and betel vine cultivators | 34                 | 14.2    |
| Total                                 | 240                | 100     |

The respondents are categorised into six occupational groups. Out of 240 respondents, majority of them (104 out of 240, about 43 percent) are employed in agriculture, while 34 respondents are wage labourers. 32 are engaged in business who run petty shops or engaged in agriculture produce related trade. The number of respondents who identified themselves as homemakers, who in turn are engaged in betel vine cultivation, are 34. The number of student respondents is 19 while the number of respondents who hold a government job is 17.

**Table No 4.9: Gender and Occupational Profile of the Respondents**

| Occupation and Gender of the Respondents |     |       |       |
|------------------------------------------|-----|-------|-------|
|                                          | Men | Women | Total |
| Government Services                      | 11  | 6     | 17    |
| Business                                 | 22  | 10    | 32    |
| Wage Labourer                            | 28  | 6     | 34    |
| Agriculture                              | 81  | 23    | 104   |
| Students                                 | 11  | 8     | 19    |
| Homemakers and betel leaf business       | 0   | 34    | 34    |
| Total                                    | 148 | 92    | 240   |

**Figure No 4.5: Gender and Occupational Profile of the Respondents**

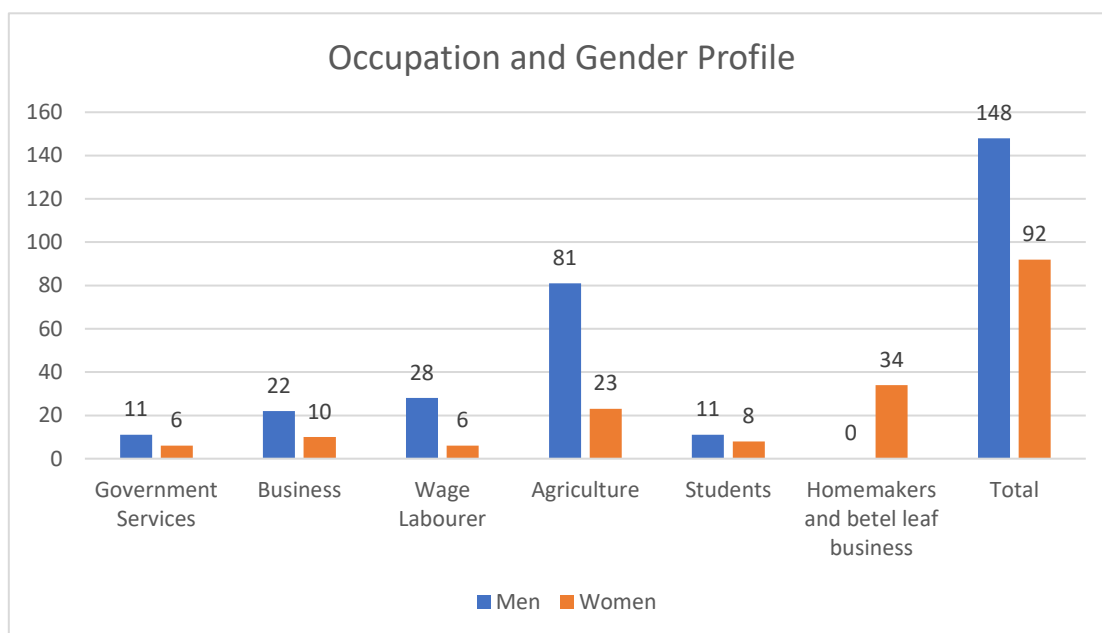


Table on gender and occupational profile of the respondents shows that all the respondents mentioned under home maker and betel vine cultivation category are women. Among those respondents engaged in agriculture (81 respondents) 23 are women. Out of 22 respondents engaged in business, 10 are women.

**Table No 4.10: Income Level of the Respondents**

| Monthly Income (in rupees) | No. of Respondents | Percent |
|----------------------------|--------------------|---------|
| Below 5,000                | 30                 | 12.5    |
| 50,00 to 10,000            | 67                 | 27.9    |
| 10,000 to 15,000           | 81                 | 33.8    |
| 15,000 to 20,000           | 35                 | 14.6    |
| 20,000 to 25,000           | 17                 | 7.2     |
| 25,000 above               | 10                 | 4.2     |
| Total                      | 240                | 100     |

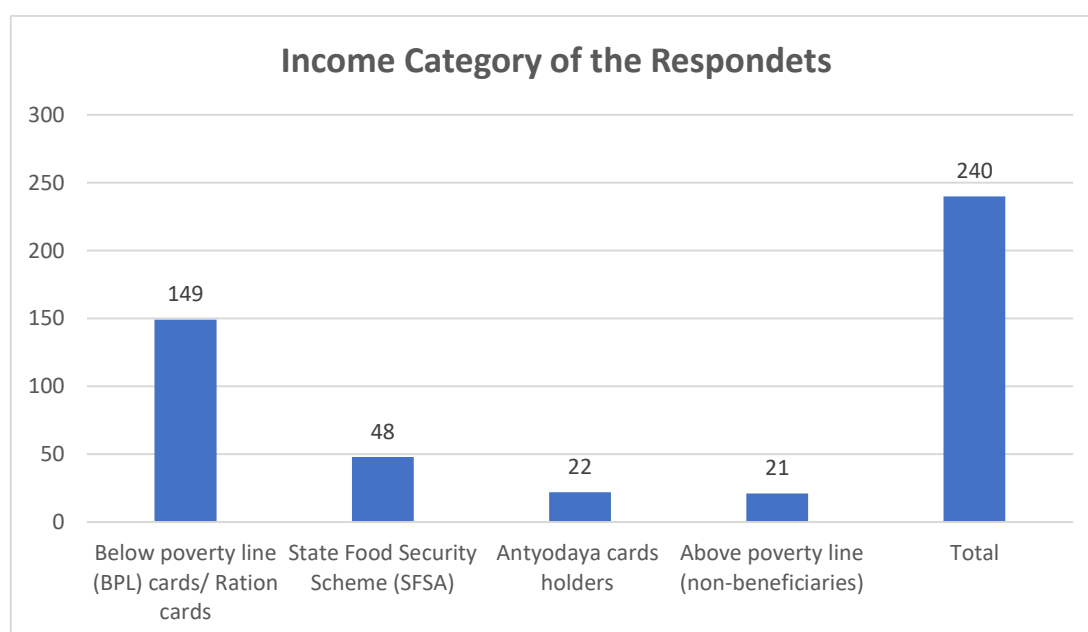
Table 4.10 on income presents data on monthly income of the respondents. Out of 240 respondents a majority (81) of the respondents' monthly income falls in the range of Rs. 10,000 to Rs. 15,000. Similarly, 67 respondents fall under the income category of Rs. 5,000 to Rs. 10,000. Only ten respondents have reported a monthly income above Rs. 25,000, and 30 respondents' income level is below Rs. 5,000.

However, data on the number of beneficiaries in the village present a scenario wherein except 21 respondents out of 240, everyone is a beneficiary of a government scheme. Although there are only 30 respondents whose monthly income is less than Rs. 5,000, out of 240 respondents of the study 219 are availing benefits under the PDS. Under the National Food Security Act (NFSA) ration cards are given to the beneficiaries based on their income and those who get the ration card are legally entitled to receive food grains distributed through the public distribution system. The ration card is distributed to the beneficiaries in accordance with the National Food Security Act 2013, which was passed in 2013. The beneficiaries access the food supplies from a ration shop at a subsidised rate. The Antyodaya card holder is the one who is considered as the poorest of the poor in the village.

**Table No. 4.11: Income Category of the Respondents**

| Income category                              | No. of Respondents | Percent |
|----------------------------------------------|--------------------|---------|
| Below poverty line (BPL) cards/ Ration cards | 149                | 62.1    |
| State Food Security Scheme (SFSA)            | 48                 | 21.8    |
| Antyodaya cards holders                      | 22                 | 9.2     |
| Above poverty line (non-beneficiaries)       | 21                 | 8.8     |
| Total                                        | 240                | 100     |

**Figure 4.6: Income Category of the Respondents**



Out of 240 respondents 149 belong to the BPL category and are the beneficiaries of various social welfare schemes, such as the NFSA or ration card. Additionally, 22 respondents are covered under the Antyodaya cards, while 48 are covered under the state food security scheme which also issues the state ration card. Notably, a significant 71.25 percent of the respondents are beneficiaries of food security programs and they have received rations under the central government programs. About 20 percent of the respondents are covered under the state welfare services, and only 8.75 percent belong to the above poverty line category.

**Table No 4.12: Access to Internet**

| <b>Access to Internet</b>                 | <b>No. of Respondents</b> |
|-------------------------------------------|---------------------------|
| Smart phone with mobile data              | 190                       |
| Depend on others for a smart phone        | 37                        |
| No internet access on their feature phone | 13                        |
| Total                                     | 240                       |

The usage of smartphones is no longer limited to telephonic conversation. It has much to do with accessing social media, sharing videos, and photos, watching reels and YouTube, and accessing essential services for which internet data is necessary. 190 respondents use mobile data on their mobile devices, and 13 use feature phones without internet. 37 respondents depend use family members' devices for their data needs.

**Table No 4.13: Gender and Access to Internet**

| <b>Gender</b> | <b>Own a mobile phone</b> | <b>Use family members' mobile phone</b> | <b>Total</b> |
|---------------|---------------------------|-----------------------------------------|--------------|
| Men           | 143                       | 5                                       | 148          |
| Women         | 62                        | 30                                      | 92           |
| Total         | 205                       | 35                                      | 240          |

Table 4.13 presents data concerning the usage of smartphones by gender for accessing internet. Out of 92 women respondents, 62 use their smart phone for accessing internet while 30 respondents depend on family members' smart phone for their internet needs. Here family members include husband, children and relatives.

**Table No 4.14: Mode of Accessing Services Offered on ICTs Platform**

| <b>Mode of Access to ICTs based services</b>               | <b>No. of Respondents (%)</b> |
|------------------------------------------------------------|-------------------------------|
| Computer (desktop and laptop)                              | 16 (0.6)                      |
| Others' mobile phones (relatives, husband, children, etc.) | 25 (10.4)                     |
| Mobile phone (smartphone, internet-enabled)                | 164 (68.3)                    |
| Mobile phone (feature phone, without internet)             | 35 (14.5)                     |
| Both Mobile and Common Service Centre                      | 202 (84.1)                    |

Table 4.14 presents data on the mode of accessing services offered on the ICTs platform among 240 respondents. Out of the total respondents, most of the respondents (164, about 68 percent) use smartphones while 16 use computers (desktop, laptop) for accessing ICTs based services. 202 respondents out of 240 (about 84 percent) avail ICTs services either through the common service centre as well as smartphones. Data suggest that mobile phones, particularly smartphones, are the most widely used ICTs tools among the respondents. This indicates the increasing trend of mobile phones and internet usage for accessing information and communication.

**Table No 4.15: Usage Pattern of Smartphones**

| <b>Use Category</b>                      | <b>No. of Respondents</b> | <b>Percentage of use Category</b> | <b>Percentage (240 Respondents)</b> |
|------------------------------------------|---------------------------|-----------------------------------|-------------------------------------|
| Communication with friends and relatives | 168                       | 18.2                              | 70.0                                |
| Entertainment                            | 203                       | 23.2                              | 84.5                                |
| Social network                           | 142                       | 15.4                              | 59.2                                |
| Social welfare                           | 191                       | 20.7                              | 79.6                                |
| Skill development                        | 71                        | 7.7                               | 29.6                                |
| Study purpose                            | 55                        | 6.0                               | 22.9                                |
| Political communication                  | 47                        | 5.1                               | 19.6                                |
| Sharing problems                         | 34                        | 3.7                               | 14.2                                |
|                                          | 240                       | 100                               | 100                                 |

**Figure No 4.7: Usage Pattern of Smartphones**

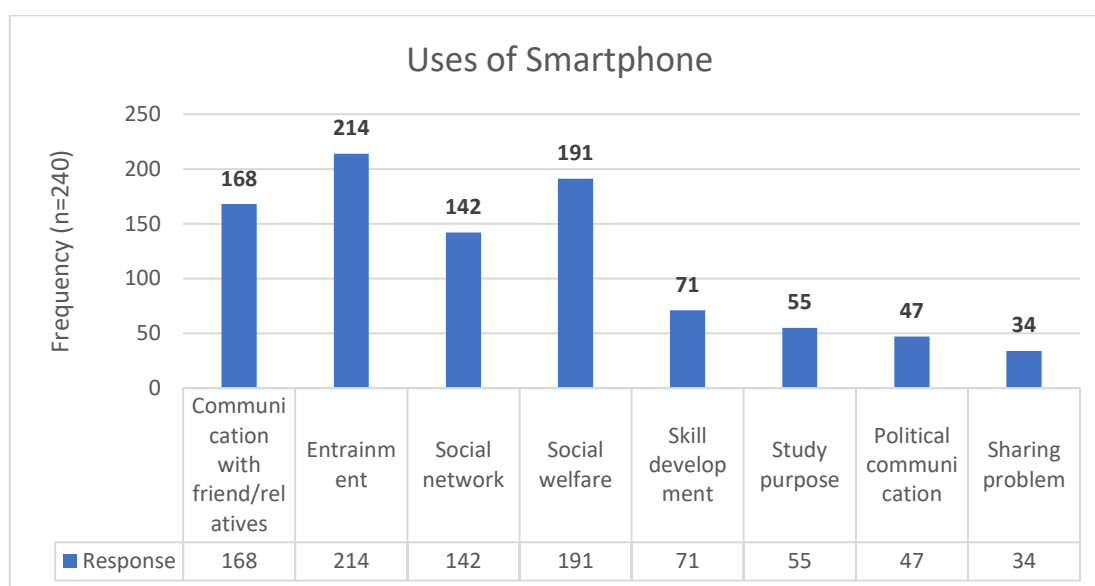
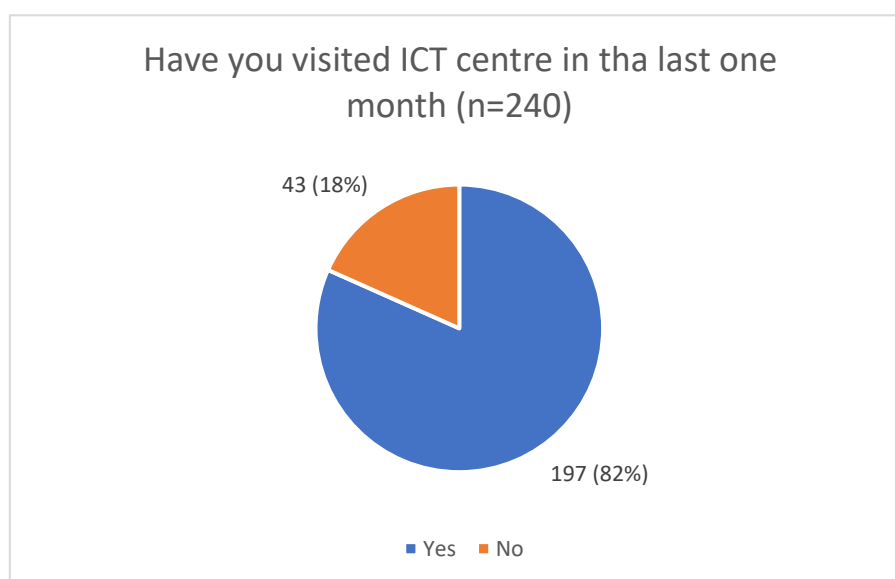


Table 4.15 and figure 4.7 presents data on the common uses of smartphones by 240 respondents in their everyday life. Out of 240 respondents 37 use others' smartphones, particularly family members' phones for use while 13 respondents use the basic phone which does not allow access to ICTs service. However, all the respondents were asked to categorise their use of smartphones (assuming that those who don't own a smartphone would use others' phones for the purpose). Data has been collected across multiple responses. It may be surmised from the data that the most common use of smartphones is for entertainment. Entertainment emerged as the most common use of smartphones as reported by 214 out of 240 respondents. About 70 percent of the respondents (168 respondents) use smartphones for communicating purpose. 142 respondents (about 60 percent) reported using smartphones for social networking purposes. Out of 240 respondents, 191 respondents (about 80 percent) reported that they were using smartphones for getting information and accessing government services. Only 71 respondents (about 30 Percent) informed using smartphones for skill development and about 55 respondents (about 23 percent) use smartphones for study purposes. Data suggests that only about 47 respondents use smartphones for political communication. Interestingly just 34 respondents share their problem with friends and relatives through smart phones. It may be inferred from data that smartphones are predominantly used for social and entertainment purposes, rather than for educational purposes.

**Figure No. 4.8: Visit to CSC**



Common service centre (CSC) provides major government to citizen services and business to citizen services. Data on the frequency of the visit to the CSC reveal that 197 respondents (about 82 percent) reported that they visited the CSC in the last month for accessing the ICTs services while 43 respondents did not visit the CSC but reportedly availed services using their smartphone.

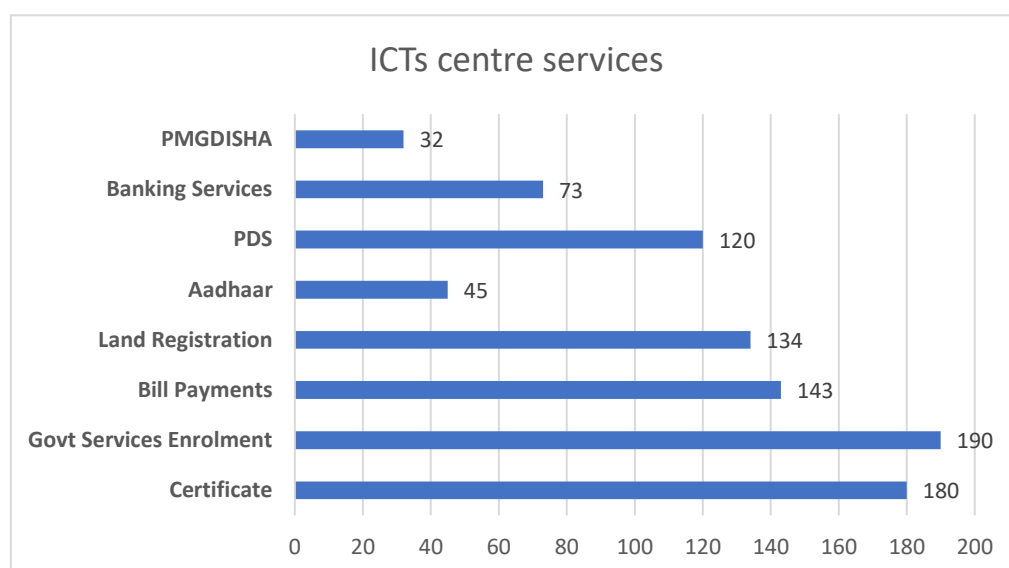
**Table No 4.16: Number of visits to the ICTs**

| The number of visits in the last month |     |       |       |
|----------------------------------------|-----|-------|-------|
|                                        | Men | Women | Total |
| Not visited                            | 5   | 36    | 43    |
| 1-2 times                              | 93  | 38    | 129   |
| 3-5 times                              | 35  | 18    | 53    |
| 6-8 times                              | 15  | -     | 15    |
| Total                                  | 148 | 92    | 240   |

Table 4.16 gives the frequency of visits to the CSC in the last month by the respondents. 129 respondents have visited the CSC one to two times in the last month for various online services. Among the 129 respondents, women respondents are 38 which is less than one third of the total respondents who visited the CSC in the last one month (one to two times). Those women respondents who reported to have visited the CSC mentioned that their visit to the CSC was

for the purpose of authentication of their Aadhaar which requires fingerprint verification. Data also suggest that 53 respondents have visited the CSC three to five times and among those who visited (15 respondents) more than six times are all men.

**Figure No. 4.9: Purpose of Visit**



Data on the purpose of the visit to the CSC by the respondents suggest that out of 240 respondents 190 have visited for government services and social welfare schemes. The respondents reported that they have availed various social welfare services by the central and state governments through the CSC. 180 respondents availed CSC services for obtaining certificates like income, caste, and resident certificate. While 143 respondents visited the CSC for bill payments like electricity bill, house tax bill, etc., 134 respondents visited for land registration services. 120 respondents visited the CSC for updating their identity details for availing the benefits through the public distribution system (PDS).

It was found that the respondents rely on the CSC to access government services and social welfare schemes. Many respondents utilize the CSC for a wide range of services, while others only use it for specific purposes, such as obtaining a passport or applying for a job. It was observed that the CSC provides convenient online services such as *e-Pauti* (land revenue payment slip) and *Bhulekh* for land registration and revenue payments. CSC also has emerged as the most convenient source for making corrections in Aadhaar card like fingerprint authentication, or corrections in name or address, etc. As Aadhaar became the most important instrument for identity verification, the beneficiaries of the state social welfare schemes appear to be thronging the CSC.

In the context of rural Odisha, e-governance initiatives have been introduced to enhance the efficiency, transparency, and accessibility of government services for the rural population. However, it is presumed that the implementation of e-governance in rural Odisha may be affected by various inequalities and challenges that hinder its effectiveness. It may be said that there are no sufficient studies looking at the experiences of different sections of rural people using the CSC delivery of services. The lived experiences of rural people using the ICTs enable governance in Odisha is also important to capture as to understand how the technology is negotiated by the rural people particularly the rural poor. It is important to critically examine how the ICTs based governance system is overcoming the structural challenges usually located in rural areas, such as caste, class and gender. To understand the social construction of e-governance, it is valuable to examine narratives from the field that highlight the lived experiences and perspectives of individuals and communities involved in ICTs led e-governance initiatives.

### **ICTs in use: Narratives from the Field**

The widespread use of ICTs and e-governance has transformed the way beneficiaries and citizens interact with government for social welfare schemes and other services. ICTs has made government services and information more accessible, convenient, transparent, participatory, and empowering.

In the current digital era, the primary objective of the governments across the globe is to provide good governance to their citizens in order to promote inclusive and sustainable development. E-governance initiatives and digital platforms have made it easier for citizens to access public services, participate in the governance processes, and voice their concerns. India, in general and the state of Odisha in particular have been experimenting with a variety of information and communication technologies in governance with the technological initiatives in public sector administration and public service delivery.

ICTs has become integral to the villagers' daily lives, shaping the interactions, relationships, and social structures. Sociologists have studied the use of ICTs in various fields, including agriculture, education, work, healthcare, public services, and entertainment. One of the major benefits of e-governance is that citizens can access government services and information at any time and from anywhere. With the use of ICTs, citizens can access government websites,

portals, and mobile applications to apply for services, check the status of applications, and obtain information about government policies and programs.

ICTs and e-governance have played a pivotal role in transforming the delivery of social welfare services in Ersama and Dinkia villages. The researcher spent more than ten months in the villages collecting data for research during 2019 to 2021, by being part of the social, cultural, and political milieu and talking to a variety of people from different social categories across gender, caste and class during his stay. This section presents the lived experiences of the respondents on using ICTs enabled government services through CSCs and smartphone. In this section narratives of the users of the e-governance from the citizen's point of view are presented. The narratives are presented under different social welfare schemes aiming at poverty alleviation, women empowerment, food grain distribution, etc.

### **ICTs in PDS**

The Public Distribution System (PDS) is a government development initiative that aims to provide food security to the poor and vulnerable sections of society by distributing essential commodities like rice, wheat, and kerosene at subsidised rates. The Department of Food Supplies and Consumer Welfare, Government of Odisha, implements the PDS in Odisha. PDS dealers are the authorised agents who distribute these items to the beneficiaries.

Aadhaar and the PDS are two important programs implemented by the government of India with the aim of improving the delivery of essential goods and services to the people. The Aadhaar program provides a unique biometric-based identification number to every Indian citizen. At the same time, the PDS is a food security program that provides food grains and other essential items to the poor and underprivileged sections of society at subsidised prices.

To avail food grains under the PDS, one must have a ration card that is issued to the members of the household based on the number of family members by the central and state governments. The PDS, however, has been criticised for its inefficiency and leakages. Despite the provision of subsidised food grains and other essential items, a large percentage of the intended beneficiaries do not receive the benefits due to corruption and mismanagement at the implementation level. There have been numerous reports of fake ration cards being used to divert the subsidised supplies to the open market, leading to a loss to the exchequer for the government and at the same time depriving the poor of their entitlements.

The PDS system has undergone several reforms in recent years to improve its efficiency and effectiveness. One such reform is implementation of an online management system called e-PDS, which aims to streamline the distribution of food grains and eliminate corruption and leakages in the system. The e-PDS system enables transparency and accountability in the distribution of food grains by using biometric authentication of beneficiaries, digitization of records, and online monitoring of fair price shop (FPS) operations.

Through e-PDS the governments have been ascertaining the identity of the beneficiaries by linking the ration card of the household with Aadhaar cards of the members of the family. This step was necessitated as large-scale irregularities in the entire food distribution system were noticed. The irregularities include, ghost beneficiaries and undeserving beneficiaries. To overcome the problems the government used ICTs tools to link the Aadhaar of the individual with the PDS card.

Aadhaar is a platform for digital identity that allows all citizens of India to apply for and receive a Unique Identity Number (12 randomised digits) by using their biometric and demographic information. Aadhaar records information such as a person's name, age, gender, and residence through fingerprints, iris scan data, and facial pictures. At the end of April 2023, 1.36 billion Aadhaar cards were generated (UIDAI, 2023).

The Government of India (GoI) initiated digitising the ration card database and seeding Aadhaar number with the PDS system in November 2014 (GoI, 2014). After completing the connection process, the PDS database has been linked with the Aadhaar number. This means every household member's Aadhaar card must have been linked to the ration card. Aadhaar-enabled public distribution system (AePDS) was introduced to bring accountability, improve the quality of services, and eradicate wrong entries of ration cards, food grain black marketing, malpractices during weighing and ghost beneficiaries, and bogus or duplicate ration cards.

The FPS acts as a focal point for PDS and all fair price shops in Odisha have the Point of Sale (PoS) system installed, which enables monitoring of transactions by the government agencies and uses biometric authentication to identify beneficiaries. Those unable to finish seeding are removed from the database and considered to be either fake or ineligible beneficiaries.

During the field work, it was observed that data inconsistencies between Aadhaar and ration cards were the primary reasons for the difficulties faced by the beneficiaries in the process of linking Aadhaar with their ration card. Wrong entries in the Aadhaar made life difficult for the poor as they cannot avail food grains from the fair price shop. This posed serious challenges

for the beneficiaries to draw their entitled food grains. Even if the entire family had applied for their ration and Aadhaar simultaneously, several discrepancies were reported in the names resulting in the mismatch of the data between the two documents. In many cases, beneficiaries are never informed of the reason why their names were omitted from the list. This was one of the most common issues that was reported in the village during the field work. Before the establishment of CSC in the village the beneficiaries were required to make several trips to government offices for corrections such as spelling mistakes or wrong initials in the name or age, etc. which were not matching with the either of the records, viz, Aadhaar or ration card. To overcome this, the individual beneficiary has to correct the Aadhaar entry for which s/he has to approach the government through the CSC in the village which forwards the application to the appropriate authority in the revenue department for necessary changes.

Another ICTs based initiative introduced by the government at the village level is the point-of-sale (POS) machine at the FPS. This POS is Aadhaar linked digital enabler for identifying the real beneficiaries. POS was introduced to curb diversion of food grains to the black market and also to identify the original beneficiaries. This ICTs enabled system introduced in the PDS in rural Odisha created lot of difficulties for the poor to avail food grains from the FPS.

Pramod Barik (38), a resident of Dhinkia village, reports that,

*The Aadhaar authentication was a difficult task. The POS machine with the ration shop dealer could not verify our credentials most of the time either due to network drop resulting in timeout or the machine just could not read the fingerprints or some other issues. Though the iris machine is also there but the rationwala says it is not working yet. Because of this we either get our rations very late or not at all as the rationwala says that without authentication from machine he cannot release our rations. Due to this we have to buy food grains from the market at a much higher price which causes severe money difficulties in that month. When this happens, I wish that we could have the old ration distribution system. We used to get less ration than we were entitled due to corrupt middleman and rationwalas, but at least, we would get our ration in time every month and would somehow make it work in our budget. But in the present Aadhaar system either we get it or do not, there is no middle ground. And there is no alternative way for us to get our government ration in case the Aadhaar system fails.*

It may be ascertained from this narrative that the POS machine verifies the beneficiary through Aadhaar either with fingerprint or iris. The verification process requires good internet

connection with the machine. But most often the network in the villages is poor leading to the problems in the process of verification. This field level experience shows that the state's reliance on the ICTs for verification instead of personal acquaintance of the FPS dealer of the beneficiary leading to hurdles for the poor. The priorities of the state are to curb the misuse or diversion of benefits meant for the needy whereas the priority of the poor is to get foodgrains at the earliest. It may be said that the ICTs has emerged as the most trusted mechanism than the traditional personal relations for the state. Negotiating technology enabled service has put the poor on the margins of the system making them more vulnerable.

Madan Swain, 35 years old, lives in Ersama village with his mother, wife, and two children. He is a daily wage labourer and a seasonal farmer. He has the PDS ration card which entitles him to draw twenty-five kgs of rice or wheat through the biometric finger print scan every month. The ration card is linked with the Aadhar card. He has been taking the ration from the village ration shop, which is connected to an internet-enabled e-POS machine. He expressed that the new age of technology has created various problems after the digitalisation of PDS through ICTs in the village.

According to Madan,

*I am getting the ration every month from the PDS shop. I have to put my finger in the Aadhaar-enabled electronic point-of-sale (e-POS) machine to authenticate my identity to draw my ration. Earlier, I used to put signature in the register to draw the ration but now it has changed to fingerprint through an e-POS machine. The ICTs played a significant role in this transformation, but the basic problem still prevails due to poor network and server problems in the fingerprint scanner machine. Sometimes fingerprint scanners cannot read my fingerprints for various reasons, including sensitivity to moisture. I am a daily wage labour, and on many occasions, the machine did not recognise my fingerprint, due to which I was excluded from drawing the ration. Although the dealer knows me very well, he denied to give me the ration without my fingerprint authentication in the e-POS machine. Due to this, the biometric machine creates a major problem in identifying the beneficiaries. The computerisation of PDS is good, but there should be a mechanism for ration in manual mode. Otherwise, many people like me are excluded from drawing ration.*

Another respondent of the village named, Parsuram Nayak (male, aged 29 years), working in a private company, pointed out that,

*I am the sole earning member of my family, which consists of five people. I work for a private company and earn only fifteen thousand per month, and it is very tough for me to handle my family's finances. I get my monthly ration for all five of my family members from the PDS outlet, and when the rationwala told me to link my Aadhaar card to my ration card, I did so at the Block Office. Before it was linked with Aadhaar, I always received my full ration allotment, but after it was done, I found that I was no longer receiving my full ration quota. Before the Aadhaar link, I received twenty-five kilograms of food grains; however, following the link, I am receiving fifteen kilograms only. The PDS dealer claimed that the names of two family members were not present in the database. I had already submitted a request in the Block office to include the missing names. But till date it has not been updated. I feel that the primary obstacle in the way of drawing the ration is the inaccurate recording of the person's name and demographic details in the PDS database. I have been running for the last four months, still the issue has not been resolved.*

PDS dealers have reported their experiences with the new system of AePDS, linking Aadhar with the ration cards. They have highlighted the benefits of using technology to streamline the distribution process, including reducing paperwork, minimizing errors, and improving the accuracy of data. CSCs have been used for digitising beneficiary data, issuing ration cards, and providing other services related to the PDS system. Some PDS dealers have reported that with the establishment of the CSCs it has become easier for them to access beneficiary data and carry out transactions. Yet, it has its own peculiar challenges.

Manoranjan Mohanty aged 38, of Dinkia village is a PDS dealer. He opens the ration shop during the first week of every month. About 50 households come for taking ration every day. He explained the experience of transformation in the PDS system from a manual system to a computerised system, from a Rs. 50/- notebook that was used to record the transactions to the Aadhar enabled biometric machine, POS. The FPS now has one Intelligent Retinal Image System (IRIS) scanner and one biometric machine. Before the introduction of ICTs based POS machine, according to the PDS dealer, the manual system was very easy to operate, record and maintain the records. The data was readily available in the form of hard copy. The distribution of the ration was easy and keeping the manual record was helpful because some of the villagers

who could not sign used to put thumb impression while drawing their ration which was done with great ease.

Aadhar and PDS mismatch is the most commonly reported problems by the PDS dealer as well the beneficiaries. This occurs when the information stored on the Aadhaar database does not match with the information available with the PDS dealer. This could happen due to various reasons, such as incorrect entry of information at the time of registration, incorrect updating of data or any other discrepancies. This mismatch can lead to an individual being denied access to the benefits of PDS. The technical glitches, wrong Aadhaar entries, and mismatch of Aadhaar name and address with the mobile number are creating major issues for the rural beneficiaries to draw their ration through the point-of-sale machines. It was observed in the field work that the beneficiaries face many problems when they draw the ration through biometrics. Some villagers have complained about the ePOS machine failing to identify the fingerprints or not matching biometrics. It is found mainly with the daily wage earners who are engaged in laborious manual works.

### **Perception of PDS dealer**

Introducing technology, such as biometric authentication and real-time data connectivity, can help minimize corrupt practices and leakages in the PDS. This can lead to improved transparency and accountability, reducing the scope for dealers to engage in malpractices. Dealers who adhere to ethical practices may view technology as a means to level the playing field and enhance the credibility of the PDS. However, few dealers find it challenging to adapt to the new technology due to limited computer literacy or access to necessary infrastructure. Technical issues, such as connectivity problems, device malfunctions, and system downtime, can disrupt operations and hinder service delivery.

A PDS dealer, Muralidhar Barik (aged 41 years) of Ersama village shared his opinion on the ICTs-driven reform of the process of ration distribution to the beneficiaries.

*The Food Supplies and Consumer Welfare Department manages the PDS in Odisha. The State Civil Supplies Corporation, the District Supply Officers, and the Fair Price Shops are the three essential components of the system in the state which provide food grains to the poor beneficiaries at subsidised rates. PDS and its entire process has been managed through centralised online real-time electronic systems by various ICTs-led technologies like POS machines and computerised fair price shops. Initially, it was challenging for me*

*to understand the whole process of digitisation of PDS, but now the process has become familiar, and people are slowly accepting the changes.*

*However, few beneficiaries are facing problems in drawing their ration due to mismatch between Aadhaar and ration cards and authentication failure. The problem occurs when the seeding fails in the e-POS machine and the demographic details in the Aadhaar do not match with the ration card. Technical glitches are common challenges faced by the beneficiaries in the computerisation of PDS. Such disruptions can cause delays in the distribution of food grains or even result in the exclusion of eligible beneficiaries. Villagers, who are heavily dependent on the PDS for their sustenance, bear the brunt of these technical challenges, which can exacerbate food insecurity and financial strain.*

Another concern is the issue of exclusion and access to services. While mandatory Aadhaar seeding intends to target beneficiaries more effectively, it can inadvertently exclude marginalised and vulnerable sections of society who may face challenges in obtaining an Aadhaar or face difficulties in the verification process due to various reasons such as errors in the database, lack of documentation, or technical issues. This exclusionary effect raises questions about equitable access to government services potentially exacerbating existing social inequalities.

### **ICTs in MGNREGA**

Mahatma Gandhi National Rural Employment Guarantee Act (MGNREA) is a government-sponsored program that provides guaranteed employment opportunities to the eligible rural households. It is a social security measure and a labour law was enacted by the government of India in 2005. The primary objective of MGNREGA is to enhance livelihood security in rural areas by providing employment opportunities and creating sustainable rural infrastructure. Eligible households in rural areas can apply for a job card at the local Gram Panchayat (village council) office. The job card is an identification document and is essential for availing of MGNREGA benefits.

The digital capturing of biometric attendance of workers was introduced by the National Mobile Monitoring System (NMMS) under the MGNREGA by the government. Previously, there was a muster role of attendance register where people did the signature for the wage days. The wages under the MGNREGA are distributed through the Block Officer by the working contractor of the village.

The money transfer is taking place through an Electronic Fund Management system (e-FMS) of Aadhaar-enabled payment system. The beneficiaries are getting the wages in their bank account through direct benefit transfer. Officially there are two stages of disbursement of MGNREGA wages. The first stage begins after the wage list, and Fund Transfer Order (FTO) have been generated and approved by the Block Officer. It is then forwarded to the Centre for processing. The state has eight days to finish the first stage. The second stage begins once the FTO has been transmitted to the centre. The centre has seven days to process the FTO and deposit the wages into the employee's account after receiving it. The Centre is responsible for this second stage, which must be finished in seven days.

However, the real challenges are faced by the persons who are enrolled for work under the scheme. They face difficulties at the time of approaching the bank to withdraw wages from their own account. Dreze (2020) observes that a new generation of payment issues emerged when the MGNREGA wage payment system adopted Aadhaar-based payments such as DBT and Aadhar Payment Bridge System (APBS). One of these issues he refers to as "rejected payment." Over the past five years, MGNREGA wage payments of Rs. 5,000 crores have been rejected.

Beginning in early 2012, the Aadhaar-based payment system (ABPS) was implemented in Odisha to distribute wages as part of the MGNREGA. The beneficiaries' job cards were required to be linked to their Aadhaar numbers and bank accounts. Aadhaar linkage with a bank account is now required to issue new employment cards or job cards under MGNREGA.

Following the implementation of Aadhaar, the MGNREGA encountered several obstacles, making it more difficult for individuals to participate in the programme and obtain its benefits. However, with the linkage of Aadhaar and MGNREGA job cards to receive payments, like many others in his village, Suraj, one of the job card holders in Ersama village, faced numerous challenges.

*I have been working as a daily wage labourer under the MGNREGA for the past four years. Before the computerisation of wage payments, I used to receive my wages in cash from the contractor, which was managed through the panchayat office. But now with the linkage of Aadhaar with wage card and bank account I have to travel twelve kilometers to withdraw money from my account. Sometimes the bank's network does not work, or some other technical issue arises. Due to this sometimes I lose my one day wages just to*

*withdraw money from the account itself. Moreover, I have to spend money on transportation, from village one-way trip costs fifty rupees; hence, I need one hundred rupees for each trip to the bank (Suraj, 38 years of age).*

Accessing Aadhaar centers was the major hurdle faced by the villagers when the officials asked them to link their job cards with Aadhaar. If there is any problem in the name or address, it has to be done in the CSC only. The villagers have to spend a significant amount of time and money on traveling to the centre. Additionally, the CSC has limited resources and overcrowded, resulting in long waiting time. Villagers faced difficulties in understanding the requirements and documents because of their lack of literacy and awareness about the Aadhaar linking process. They struggled to navigate the complex online process and faced challenges in submitting the necessary documents and information.

The technical issues and errors in the Aadhaar database added to the frustrations. Some individuals faced issues with incorrect or mismatched information in their Aadhaar records, which caused delays in the verification and linking process. These discrepancies required additional visits to the Aadhaar centre and lengthy follow-ups with authorities to rectify the errors.

Bikash Prusty (37 years age), daily wage labour dependent on MGNREGA, observes,

*I faced many issues after the newly implemented app-based National Mobile Monitoring System (NMMS) programme, which was fraught with issues of biometric authentication problems, lack of technical support, and the issue of internet connectivity. Most of the worksites of MGNREGA in the remote region have network issues where the internet is either slow or unavailable. The second major issue is a double-stamped photograph of a worksite with geo-tag workers. I often start my work in one location and finish my work in one location. But I have to go to the first location for the photo at the end time of the day's work. This attendance system has been generated from biometric authentication under NMMS. Real-time monitoring requires a reliable network, which is mostly lacking in the working sites in villages. Because of this, sometimes, I miss a day's work as I am unable to mark my attendance.*

Dibakar Mallick, aged 28, belongs to the scheduled caste community and depends upon MGNREGA for his livelihood. He has four family members including his wife, one child and an aged mother. He says,

*I am working on the construction site in the Tirtolo Block. I used to earn Rs. 350 per day. My family is dependent on MGNREGA wages. Hardly I am getting daily work and the contractor has taken my job card. Now the biometric attendance is mandatory using mobile phone. Using mobile phones was challenging when there was no network availability. Moreover, I have never used any mobile phone; how can I give the attendance through mobile? My fellow workers and I face the same problem to mark our attendance.*

The challenges that have been brought about by the mandated connection of Aadhaar for MGNREGA payments are highlighted by the difficulties that beneficiaries in the field encounter. Despite the fact that Aadhaar was supposed to simplify procedures and cut down on corruption, its actual implementation resulted in the creation of obstacles for poor people who relied particularly on MGNREGA for their means of livelihood. Not only did these difficulties result in an annoyance and a financial burden, but they also posed a threat to the rural households' access to the government welfare schemes.

### **ICTs and Pension Distribution**

The National Social Assistance Programme is a social welfare scheme that is supported centrally and comprises pensions for the elderly, disabled, and widows. The government of India and various state governments have made it mandatory to link Aadhaar with the beneficiaries account to complete the Direct Benefit Transfer (DBT) process for all pension funds so that the amount is directly credited into the beneficiary's bank account.

ICTs has significantly impacted the pension disbursement system in Odisha, bringing both benefits and challenges for the beneficiaries, particularly, the old age people. While ICTs has introduced efficiency, convenience, and transparency to the pension process, they have also presented various difficulties for beneficiaries who may face challenges in adapting to new technologies.

The pension system has traditionally relied on manual processes, often resulting in delays, corruption, and inefficiencies. However, with the advent of ICTs, the government implemented various digital initiatives to streamline the pension disbursement process, enhance transparency, and ensure prompt and accurate payments. While the ICTs interventions have undoubtedly improved the pension disbursement system's efficiency, poor, women and elderly often face challenges in navigating and adapting to technology, leading to difficulties in accessing their pension benefits. Elderly people face difficulties in accessing their pension benefits, as they may have to travel long distances to access bank facilities or depend on others for assistance.

Kamala Mallick, (age 72 years), shares her experience,

*I am a poor old lady. My age is seventy-two years. I never got to finish my education and can barely read. When these government sahibs (officials) tell me about Aadhaar and all this technology, I do not understand what they are saying, I only know that I need my Aadhaar linked to get my ration and my pension. So, I took the help of the computer shop person in the village. I thought it would be one simple visit, but I had to pay Rs 100. Even after paying money, I could not get my Aadhaar linked. The boy said the application was rejected and that I had to apply again. I had to make multiple attempts and trips to the computer shop and each time I visited, I had to pay Rs 100. After a series of visits finally I got my Aadhaar linked. I do not know why it was getting rejected. Now with this linkage done I can finally get my pension. But now I need to link my Aadhaar with bank to withdraw cash from my account. Earlier it was delivered in my village itself, but the bank is very far and it is very difficult and tiring for me to go there. But there is no other way for me to get my pension. This pension is my only financial support at this stage of my life.*

The researcher has come across two types of difficulties faced by the beneficiaries in linking their old age pension details with Aadhaar and bank accounts. It was found that some respondents' names were omitted from the pensioners' list when their Aadhaar numbers were linked to the pension. The second type of problem was some respondents failed to collect their pension using biometric verification. Moreover, distance to the bank was also found to be another major hurdle in withdrawing money from their account. There were several incidents about which the respondents shared on the failure of technology in the process of authentication. In fact, these technological obstacles arising out of poor network are common to old age pension disbursement, PDS food grain distribution and employment guarantee works wage disbursement.

Sarita Deury, 65-year-old Dalit woman who lives in the village of Dhinkia, has her pension details linked with her account in a bank located in Ersama village. She had submitted her Aadhaar card when she opened her account to withdraw pension money. But now the bank is asking for Aadhaar again as her account was not linked due to an Aadhaar mismatch. To rectify the error, she had to visit the bank several times. Every time she went to the bank to withdraw her money, she had to wait for hours to complete the authentication.

Bijay Mallick, 71 years, is another old age pension beneficiary who has similar experiences. In his words,

*Earlier, getting a pension from Anganwadi or panchayat office was easy because it was close to our houses. There was no need to fill out any paper challan. I just used to put my thumb impression in the register. Now, I have to take the shared autorickshaw from my village to go to the bank, or request someone to take me to the bank which is about 11 km from my village. Travelling to the bank costs me about Rs 100 per trip. Also, waiting in queue at the bank is very tiring because of my old age. I cannot go to the bank every month, which is impossible for me as my health is not good, and now I am afraid to travel.*

Babula Mallick (74) faced challenges in the Aadhaar verification process. He is getting pension through DBT and the money is credited in to his bank account directly. He is getting Rs. 700 under the pension scheme. Earlier the money was distributed in the panchayat office by the panchayat secretary but now it is coming to the bank account. The major difficulties in drawing the pension money arises from the failure of the fingerprint authentication in the bank.

## **Gender and ICTs**

Mobile phones have become an essential part of modern life in urban and rural life. Men and women use these devices, however, the rate of use of smartphones by women was found to be less in the study villages. The use of smartphones by women in villages is significantly less when compared to men. Out of 92 women respondents only 22 respondents own a smart phone and the rest depend on other members of the family like her husband or children to use the smart phone.

A majority of the male respondents opined that men in the family are capable of using mobile phone whereas women are less capable. When the researcher asked about their capability of using the smartphone women respondents said that men of their family don't allow them to use at first place. The women respondents mentioned that for women a smart phone is not necessary as women stay at home whereas for men it is a necessity because they go out and need smartphone for various purposes. The employment of technology thus certainly reinforces patriarchal values.

During the interview, women respondents said that they were not permitted to visit the ICTs centre even if they wanted to obtain documents from the internet on their own. Their brothers

or father went to get the necessary documents on their behalf. Traditional gender roles may confine women to domestic duties, limiting their opportunities to engage with technology.

In the FGDs, women narrated about their experience with mobile phone. A women respondent, aged about 30 years observes that,

*I normally use a feature phone for talking to my family members and relatives. My husband is staying in Gujarat and my son is studying in Ersama College. My husband calls me every day. I do not know how to use the phone. When I want to use, I give a missed call to my husband. I do not put any recharge top-ups in my mobile. Recently my husband gave me a smartphone and I do not know how to use it efficiently. My son is using it and attending the online classes. I have no social media account.*

Among the rural users of ICTs, poor and uneducated women are on the margins of the spectrum of phone users. One of the respondents shares that,

*Rural women have less opportunity to utilise mobile phones and other forms of ICTs because they have lower levels of education, fewer skills in using technology. They cannot afford to buy a phone for them. Family members, including husband and children think that women as homemakers in the family do not require any phone as they can use other members' phones whenever they require.*

### **ICTs and Village Level Entrepreneurs (VLEs)**

The common service centres are managed by the village level entrepreneurs (VLEs). VLEs play a major role in the delivery of state services to the citizen at the village level using ICTs. Thus, VLEs have emerged as the key stakeholders in e-governance system. They are the primary operators and provide service to people from the rural areas who come in direct contact with them. They act as intermediaries, assisting villagers in accessing various government schemes, programs, and services.

The common service centre is a government of India initiative to provide e-governance services to rural and unreachable remote areas. It is a multi-services-single-point centre proving multi programme with multi transitions in a single geographical location. In rural Odisha, VLEs play a vital role in bridging the gap between government services and local citizens. From obtaining

birth certificates to death certificates and from Aadhar cards to Pan cards and from Ration cards to Passports, citizen, across caste, class and gender can access CSC centre run by the VLE.

The common service centre is located about five kilometres away from Ersama, the study village. The centre is located in the middle of the market. The CSC is situated in a shutter/commercial space opening to the busy road. It has two desktops, a printer and a photocopying machine. It is supplied with electricity and there is a battery backup for uninterrupted power supply.

The village has no optical fiber cable connection, but the VLE uses hotspot from his mobile data which has connection of Jio 4G network. Although the network is insufficient the VLE has no other option but to rely on this slow mobile data. The CSC usually opens at 9.00 am and closes at 8.00 pm. It was observed that on a typical day more than hundred people visit the CSC. The service requirements range from birth certificates to death certificates, social welfare schemes, Aadhaar cards, Passports, Pan cards, Job cards, e-Shram cards, Patta and *Pouti*, PDS/Ration cards, Health cards, etc. The centre also offers bus, train and flight ticket booking services to the needy.

Jatia Nayak, the VLE who operates the CSC says,

*I have been associated with CSC since 2016. The villagers come to the center for various e-governance services. Users belong to all the age groups across gender and caste. They avail services offered in the CSC. I have employed three persons to manage the CSC. Now with the government including all the services online and the application process also has become online, people are not going to the government offices, rather they are coming to my centre. I can provide all the G2C services enabled by the government. I completed the telecentre entrepreneur course (TEC) certificate after which I was allotted the CSC.*

### **ICTs use in Land Records**

There is a paradigm shift in the land registration process in India in general and the state of Odisha in particular. Odisha state digitalised and computerised the land registration process completely. The Digital India Land Records Modernizations Programme (DILRMP) is comprised of the following three key components;

- (a) Computerisation of all land records, including mutations, digitization of maps, and integration of textual and spatial data;
- (b) Survey/re-survey, which includes updating all survey and settlement records, as well as the creation of original cadastral records wherever necessary; and
- (c) Computerisation of registration, which includes computerisation of sub-registrar offices (SROs) and its integration with the land records maintenance system, as well as the development of core GIS and capacity building.

The process begins with the collection of data from various sources, including physical survey maps, land ownership documents, and other relevant records. These documents are carefully examined and the relevant information is extracted for digitization. The collected data is then entered into a computerised system, usually through the process of scanning and data entry. This step involves converting the physical documents into digital format, ensuring that the information is accurately captured. To make the digital land records easily accessible to stakeholders, a centralised online portal is established. This portal is a platform for accessing land records, allowing individuals to search for specific land parcels, view ownership details, and obtain relevant information. Online access eliminates the need for individuals to visit land offices, saving time and effort physically.

Bhulekh is the online land records portal that provides access to land-related information in Odisha. It provides digital land records, including details of landowners, land measurements and plot maps. e-Dharani is an integrated platform for property registration and management in Odisha. It facilitates online property registration, mutation, and other related services.

Prior to the introduction of digital initiative, the land records were manually prepared and preserved. This record system was more complicated, and the land record processes had numerous challenges and disputes. Additionally, the record of rights was never correctly set out, and it was mainly intended to accommodate wealthy and powerful people in the villages. With the ICTs implementation and computerisation, the land and revenue information system has become more effective, accurate, and transparent with citizen-centric services.

Explaining the experience of using the land record service using ICTs Tukuna Rout, 35 years old, says,

*Recently, I purchased a piece of agricultural land in my village and got it registered at the Sub-Registrar's office. I have verified the land details by going through the Bhulekh and e-Dharani web portals through which I assured myself about the land owner, and land record. The computerization of land records helped me in accessing the land records, sitting in my village. Otherwise, I would have had to run around the revenue offices for days together to verify the land records. Digitization of land records has created a trouble-free and transparent system that provides the information like land owners' names, the khata number and land location. I am able to access all of these services through the internet and the official website for land records, both of which are provided by the common service centre. I can also use my mobile device to check these details. I am happy that the land records have been computerised and with the help of ICTs based web portals, each land record is available online.*

Manoj Deury (43 years of age), a small farmer, sharing his experience suggests that

*The computerisation of land records and online payment systems of land revenue has minimised corruption. Before the computerisation, we were forced to pay bribes to the clerks in the revenue office to get our work done. I used to rely on the services of the intermediaries or had to make several visits to the visit government offices to obtain information, which often resulted in delays and inefficiencies. The power dynamics also played a significant role in the village which always favoured the upper caste big land owners. Now, my relatives and I have been paying the land revenue online at the local common service centres. The centre is charging some basic fees. Sometimes my relative's son, who is a graduate, pays the revenue amount through the Odisha government land revenue e-Pouti website for free also.*

Digital land records are now accessible online through a centralized portal. Landowners, government officials, and other stakeholders can easily access and retrieve information from anywhere, eliminating the need for physical visits to government offices. Digitization has improved transparency in land management. Landowners and interested parties can verify the authenticity and accuracy of land records, reducing the scope for corruption and unauthorized alterations. The digitization of land records has streamlined land-related processes, such as land transfers, registration, and obtaining land-related certificates. This has reduced paperwork, simplified procedures, and accelerated the overall process.

## ICTs use in Business

A large number of people from the nearby villages travel to Ersama market for purchasing essential items. The shops and commercial establishments in the market area have installed digital payment systems. Various shops like paan shop, grocery shop, tailor shop, sweet shop, apparel shop, fancy store are located in the market area. It was observed by the researcher that all the shops were equipped with QR code machines and offered the option to make payments online.

Mohan Charan Muduli, 35 years old, is the owner of ‘Smile Mobile Shop’ located in the market area. Mohan completed intermediate in Arts. He has been interested in mobile technology since his school days. He set up this mobile shop after he stopped his studies. He equipped his shop with a computer and a printer used for giving receipts and also the fingerprint scanner to verify the Aadhaar of the customer while selling the SIM cards. He observes that,

*The shop is now nine years old. When I opened the shop in 2012 after my studies, I had only one landline phone, one post-paid Nokia GSM (Global System for Mobile Phone), and one CDMA (Code Division Multiple Access). People from the village used to come to my shop to make phone calls to their relatives. At that time, the cost of the call per minute was so high that people only talked for a very short period. Later, I started selling small feature phones, SIM cards and talk time voucher cards. I was doing good business selling mobile phones of low cost, SIM cards and data vouchers. But now the situation has changed completely with the entry of smartphone and the touch screen phone. The smartphone cost has become affordable now and even the data costs are very low so that people are using widely. Drastic changes occurred with the availability of smartphone and network penetration into rural areas and the portability option for shifting from network to network changed the rural communication scenario.*

In Dhinkia, another study village, the *Maa Santoshi* variety shop is owned by 41-year-old Gourang Pradhan, who sells vegetables, groceries and other seasonal goods. He has a Vivo dual sim smartphone with a 4G network and he has two QR (Quick Response) code stickers pasted on the wall of his shop for the digital payment services like, Google Pay, Paytm, and PhonePe. The customers have the option of digital payment using the QR scan sticker. Even in the middle of a noisy marketplace, he can hear the Paytm soundbox placed close to his cash box, which plays the “payment received”, an AI generated speech alert that comes after the successful payment. The sound box has a monthly rental fee of Rs. 125 and protects him from

consumers who exhibit fraudulent confirmation digital receipt. Since the QR code uses the unified payments interface technology, money is transferred to his bank account in a matter of seconds. UPI makes it possible for banks and payment networks to send and receive money without any problems. Today, QR codes are used for 80 percent of all of his daily sales. He also pays at the mandi, or wholesale market, using the QR code.

According to Gouranga,

*I have started using these technologies during the lockdown. I have installed Google Pay and Paytm and a local person from my village helped me setting up the bank account with the payment application. Now I have put up a QR code sticker in the shop. Recently, the Paytm representative gave me the sound QR code machine which costs Rs.125 a month. It alerts me as soon as the customer pays the amount using the QR code. This is very helpful as there are less chances of fraudulent transactions. I have little expertise in the usage of smartphone, but I found the online payment and receiving money through mobile to be very simple to use in my business.*

### **ICTs in Agriculture Market Governance**

The use of ICTs and mobile phones has also significantly changed how farmers work in Ersama and Dinkia villages. Farmers used to rely on traditional farming methods in the past, which often led to poor yields and low income. However, with the availability of smartphones, farmers are now accessing weather forecasts, market prices, and other agricultural information. This has helped them make better decisions about what to grow and when to harvest, resulting in higher yields and better income.

In the study villages the researcher observed that farmers are using smartphones to receive information on weather forecasts and market prices. ICTs based marketing service named as e-NAM (National Agriculture Market) is being used by farmers to get remunerative price for their farm produce. e-NAM is a digital platform that was launched by the Government of India in 2016. The aim of e-NAM is to create a unified national market for agricultural commodities by connecting all the existing agriculture produce market committees (APMCs) in the country. This digital platform allows farmers to sell their produce directly to buyers, eliminating intermediaries and resulting in better prices for farmers.

Before the launch of e-NAM, farmers had to sell their produce through intermediaries like commission agents and traders, who often exploited them by offering low prices. e-NAM aims to eliminate this exploitation and provide farmers with a transparent and competitive market to sell their produce. The platform allows buyers to bid for the produce, which helps to determine the fair price of the produce.

e-NAM has been a game-changer in the agriculture sector in India. The platform helped to create a level playing field for farmers and buyers, which has resulted in better prices for farmers. The platform also provides real-time information on market prices, which helps farmers to make informed decisions on when and where to sell their produce. It has also been beneficial for buyers, especially those who operate in distant markets.

It was reported in the study villages that before the launch of e-NAM, and e-Procurement, farmers used to sell their produce to middlemen at low prices. However, after the launch of these ICTs based platforms, farmers are able to sell their produce directly to Mandi, eliminating the need for middlemen and resulting in better prices for their produce. Aurobinda Prusty, 38 years old farmer of the village, explains the transformation of ICTs in agriculture,

*I am a small farmer belonging to Dhintia village. I passed intermediate from the village primary school long back. For a long time, I have been dependent on traditional methods of farming and have struggled to earn a decent income from agriculture. I have all the traditional agricultural equipment like bullock cart and plough. The traditional method of agriculture has changed over a period. In the present days all agricultural operations are performed using machines. And now ICTs are providing information through smartphones. I have started using different mobile apps to get information on the latest farming techniques, crop varieties, and pest management strategies. My betel vineyard is taken care of by my wife and my father and I am looking after the supply part of the leaves. During Covid I have started selling the betel leaves online mode, which allowed me to reach a wider market and sell my products at a better price. I have used social media platforms to know about more information on farming and uses of technology in farming.*

*I am also getting Rs. 2,000 per acre through direct benefit transfer under the PM Kisan Samman Nidhi (PM-Kisan) scheme of the central government and Krushak Assistance for Livelihood and Income Augmentation (KALIA) scheme of the Odisha state*

*government. This scheme has boosted my agricultural activity and financial assistance which helps me to buy the hybrid seeds, fertilizers and pesticides. The best thing is I am getting this financial assistance directly through my bank account.*

Maheswara Muduli, another farmer of the same village, although did not receive formal education, is quite active in using digital technology. He has a Samsung smartphone and uses to all tasks linked to agriculture. Despite his lack of primary education, he is able to use the smartphone. He has the number for the Kisan call centre. He gets new information regarding the farming operations by calling the call centre.

### **Contextualising CSCs within Odisha's Rural Sociocultural Landscape**

In the recent past, the proliferation of CSCs in Odisha has transformed the delivery of government services at the village level. These centres, also known as *Jan Seva Kendra*, serve as vital intermediaries between the government and citizens. The CSCs have emerged as an integral component of the state's digital governance initiatives, aiming to bridge the digital divide and provide access to government services to marginalised populations. From a sociological point of view, examining CSCs provides valuable insights into the social, cultural, and political dynamics of rural communities, as well as the impact of technology on local governance and development.

CSCs act as multifunctional service delivery points, empowering rural residents by providing access to a wide range of government services. It facilitates the registration of births and deaths, issuance of certificates, utility bill payments, banking services, and online application submission for government schemes. By streamlining these processes, CSCs alleviate bureaucratic hurdles, reduce corruption, and promote transparency, fostering a sense of agency and empowerment among rural populations.

### **Structure of CSCs**

The CSCs are physical centres established at the village or panchayat level, strategically located to ensure e-governance accessibility to rural residents. These centres have become vital nodes for accessing official certificates, banking services, and online government schemes. It is a one-stop solution for various digital services and enables access to government schemes and e-governance services. The CSCs are often considered as intermediaries that play a crucial role in bridging the gap between the government and the community.

CSCs are a part of the Digital India initiative launched by the Government of India to ensure that government services are made available to citizens in a more efficient and accessible manner. By establishing a network of CSCs across the country, the government aims to bring digital services closer to the people and ensure that individuals have easy access to information and services that they may require. The CSCs serve as intermediaries, enabling citizens to avail themselves of essential services and benefits offered by the government, thereby facilitating better governance and promoting inclusive development. The CSCs act as equalizers by providing services and information that promote socio-economic mobility and bridge the gap between the privileged and marginalised sections of society. Villagers, who have limited exposure to technology, view CSCs as gateways to governmental resources and as a symbol of progress and development.

### **CSCs in Dhinkia and Ersama villages**

Prior to the establishment of CSCs in Dhinkia, the governance system consisted of a manual way of service delivery and the villagers were dependent on government departments for their needs. The delivery of public services and interaction between the government and citizens often relied on traditional methods, such as in-person visits to government offices, paperwork, and manual processing of applications. This approach sometimes led to inefficiencies, delays, and limited accessibility, especially for people living in remote areas.

In the traditional mode of governance, intermediaries often played a significant role in delivering government services in rural areas. While some intermediaries genuinely assisted rural people, others exploited their positions for personal gain. Intermediaries would often demand bribes or engage in corrupt practices to facilitate the delivery of social services. They exploited the lack of transparency and accountability in manual processes to extort money from rural people who were dependent on these services and impose additional fees or charges on rural people for availing social services. With the computerisation of government schemes, services enabled through ICTs along with the establishment of CSCs and other digital platforms, the role of intermediaries has been minimized. These e-governance initiatives promoted transparency, reduced corruption, and are ensuring direct access to social services for rural people.

Drawing upon the focus group discussion with beneficiaries at the CSCs and in-depth qualitative interviews with VLEs and other officials, the study explored the experiences of the villagers using ICTs led governance system.

The researcher used the CSC as a site of data collection as many users (villagers in need of government services) visit the CSC every day. The researcher talked to them individually and sometimes led the group of users to a focus group discussion. The researcher also used observation method to understand the dynamics of CSC transactions. The researcher noticed that several users who come to the CSC were beneficiaries of the government social welfare schemes, farmers, students and women. They were mostly applying for certificates, checking their subsidies, withdrawing money, bill payments, etc. Most noticeable thing the researcher observed was that, every visitor to the CSC carried in their hands a photocopy of Aadhaar card or ration card or original Aadhaar card, bank passbook, etc. or all of them tucked in a newspaper or an old cloth bag or a multicoloured polyethene shopping bag.

From the group discussions with the visitors and more particularly the beneficiaries of the government programmes the researcher arrived at following key observations.

- Visitors to the CSC cut across caste, class, and gender.
- Most of the poor and who belong to the lower caste come to the centre to obtain government services are more patient and polite with the CSC staff. For them the government benefits are the sole sources of livelihood.
- In the months between June to August majority of the users are students who come to the CSC to apply for admission in different colleges and universities as the government college admissions is made online in Odisha through common application form under the student academic management system (SAMS) in Odisha.
- In the months between October and December majority of the visitors are farmers who come to the CSC to access e-mandi website to sell paddy.
- It was reported by the owner of the CSC that during the Covid period, people accessed centre for online vaccination booking also.
- Otherwise, every day visitors include those who come for obtaining government certificates like birth, caste, income, nativity certificates, etc.; to get copies of land registrations, to recharge phone, to pay electricity or land revenue bills, etc.

Most of the visitors to the CSC with whom the researcher interacted claimed that they use CSC for every need related to state services, like paying electricity bill, land revenue cess, application for a certificate, etc. In the old system of governance, they were made to visit the concerned government offices many times to get the work done. Moreover, they had to travel to Ersama block or district headquarters, which is around 23 and 70 kilometers distant

respectively from the two study villages. Now they expressed happiness as the services are available at one place i.e., CSC which is very close to their village.

Mitua Baral, a 32-year-old resident of Erasma observes that

*I remember visiting the government office for caste and income certificates. I had to run behind a few influential people to obtain the certificates. First, I had to request the sarpanch of my village to refer me to the government official like Tahsildar or a Sarakari babu (Government official). After that I used to make several visits to different offices. Earlier, there were several photocopies required, which included the land record of rights, the land revenue slip, and identification proof for caste or income certificate. It used to take several weeks to obtain the certificates. That too by paying bribes to the clerks.*

*Now all these services are computerised and I am coming to the CSC for accessing a variety of services. For example, the owner of the CSC helped me opening my bank account online. Now I can get the money transferred to my account under the government schemes. I don't have any idea about computers and I only know that government link is available at the centre. If I need my land registration certificate the CSC owner will give me in no time for which he will just charge Rs. 20. I have applied ration card, the KALIA scheme and other service in this centre only. For withdrawal of money, I have to put my fingerprint in the machine and the staff at this CSC would complete the transaction and give me my money from my bank account. He took 20 rupees from me for money withdrawal. I am happy because the nearest bank is 15 kilometers away from my village, and the cost of going there would cost me not less than Rs. 100.*

A respondent during the FGDs pointed out that

*The CSC served as a hub for accessing government e-services. I have availed the services like obtaining government certificates with ease at the CSC. This digital facilitation significantly reduced the time and effort required for such transactions and brought essential services closer to the villagers.*

Another respondent observes

*In the past, cyber cafes were popular establishments where individuals, especially youth, accessed the internet and various digital services. Of late, CSC has been very popular in the village because it provides our tasks easily and without charging us much fee.*

*Villagers admire the VLE who runs the CSC for completing the tasks quickly. He provides solutions to all the problems related to e-governance issues.*

CSC was reportedly acting as a social hub in rural areas. It was mentioned by some respondents that CSC is the place where they meet farmers and known people from different villages regularly. It is said to be fostering social interactions and strengthening community networks. For example, when a person visits the CSC for a service while waiting for his/her turn s/he would try to interact with known as well as not familiar persons also. While waiting for their turn, individuals engage in conversations, share information, and exchange ideas with one another. The CSC becomes a bustling space where people from different backgrounds and age groups come together, fostering social interactions. Sociologically, these interactions enhance social cohesion, social capital, and social solidarity within the community. CSCs serve as platforms for community dialogue, collective decision-making, and the exchange of local knowledge and traditions, preserving and enriching the cultural fabric of villages.

Another key informant, an official of NIC, Chinamaya Parida, expresses that

*CSCs have brought about significant social transformations within rural communities. They introduced new technologies, digital platforms, and information-sharing systems that influence the way rural people access government services.*

However, the CSCs also suffer from certain limitations. The major challenge faced by the CSC, as observed by the researcher, is poor network connectivity. Connectivity is either not available or unreliable. The inconsistent internet connectivity makes it challenging for the CSCs to deliver online services effectively. Slow internet speeds, frequent disconnections, or the absence of connectivity altogether can hinder service delivery and impact the user experience. The centre is heavily relying on government websites and online portals to access government services and process applications. However, websites can experience link failures and downtime due to server issues and network problems. When websites are inaccessible or experience frequent interruptions, CSCs face difficulties in delivering services and assisting users.

The VLE of the CSC states that

*The problem in accessing the government services is due to poor connectivity. Sometimes technical glitches and link failures can occur due to various reasons such as hardware issues, software bugs, and problems with internet service. These issues result in intermittent*

*or complete loss of connectivity, impacting the functioning of CSCs. Sometimes the visitors have to wait for days to get the services.*

Another loophole in the system is lack of feedback mechanism and options for online grievance redressal mechanism specially aimed at serving the rural poor. The CSC staff often discourage such transactions as they have no clue and the staff do not render any online service without charging a fee. That means, the citizens, particularly the rural poor who have a grievance has to pay for registering a grievance online.

The e-governance mechanism operated through ICTs is often found to be lacking in the feedback mechanism. A woman respondent belonging to SC community reported that,

*I took the help of CSC centre to apply for ration card and KALIA scheme with the Aadhaar and bank passbook documents. The CSC owner took my fingerprint in the machine and applied for the scheme. But I did not get any cards and benefit of the scheme till date. I hear in the village that, although I have applied online, the middlemen of the village are making the final decisions about who should get the government benefits and should not get. That is why I am not happy about this CSC, the government is not listening to the voices of poor people. I had to run behind the Sarpanch and other government officials for more than a year to get my work done. There is now an online system which is good, but after that application process, the middlemen are still playing a big role, which is why I cannot get these services. There is no grievance mechanism to complaint regarding these issues. Therefore, the challenge is that despite the widespread adoption of technology, middlemen continue to play a crucial role in the delivery of some services.*

### **Implications of E-Governance in Rural Odisha**

E-governance initiatives in rural Odisha have radically altered the way people perceive government and government services. It created greater awareness about the ways of availing government services using internet. This has enabled citizens to access government services quickly and easily, leading to improved access to food grains, livelihood, education, health, and other services. In addition, the use of technology allowed for greater transparency in the delivery of services and better management of public resources.

The sociological implications of ICTs-led e-governance initiatives are is multi-faceted. Firstly, ICTs based e-governance challenged the existing power relations by reducing the influence of intermediaries and middlemen who often exploited the villagers. The CSCs promoted a sense

of autonomy and agency among the community members, allowing them to directly engage with the government machinery. Secondly, the initiative fostered a sense of transparency and accountability in governance. The availability of online records and the digitization of processes minimized the scope for corruption and facilitated greater trust between the government and the citizens. This enhanced transparency helped strengthen the social contract between the state and its citizens.

The implementation of e-governance in rural Odisha has been shaped by various social, economic, and cultural factors. These factors have influenced the way e-governance is perceived and used by citizens in rural areas. While e-governance initiatives aim to provide equal access to government services and information, the digital divide remains a significant challenge in rural Odisha. Limited infrastructure, unreliable connectivity, and low digital literacy rates can exclude marginalised communities from fully benefiting from e-governance. This unequal access perpetuates existing social inequalities and reinforces the marginalization of certain groups. The digital divide, characterised by unequal access to technology and information, is a significant sociological consideration in rural areas.

### **Perceptions about ICTs based CSC centre**

The perceptions on ICTs and their impact on governance in villages are complex and multifaceted. While ICTs can have a positive impact on governance by increasing access to information and services, promoting transparency and accountability, and enabling greater citizen participation, there may be challenges related to access, cost, and cultural norms that need to be addressed in order to fully realise their potential benefits.

The perception of ICTs and their impact on governance in rural areas can vary depending on a number of factors, such as access to technology, level of education, and cultural norms. In some cases, rural people may view ICTs as a tool for improving governance and increasing access to information and services. For example, they may see the use of mobile phones and the internet as a way to avail government services quickly, access public services, and share information with other community members. ICTs has been perceived to be providing greater transparency and accountability in governance when compared to the previous ways of governance.

The citizens view ICTs as a way to access public services and to improve their quality of life. However, some villagers are skeptical about the role of ICTs in governance. According to them

these technologies are expensive, too complex, or too unreliable to effectively improve governance. Additionally, some villagers are concerned about the potential negative impact of ICTs on traditional forms of governance and community decision-making. Moreover, there may be a digital divide in rural areas with limited access to ICTs. This leads to unequal access to information and services, and exacerbate existing social and economic inequalities.

Interactions with the respondents suggest that the CSCs have helped to bridge the digital divide in rural areas and have made government services more accessible to people living in villages. They appreciate the services provided by the CSCs as they are affordable and convenient. Respondents also appreciate the fact that the CSCs provide these services in remote and rural areas. It has also been found that CSCs are helping to bridge the digital divide in Odisha by providing digital services to people in rural areas and the CSCs are providing these services in local languages, making it easier for people to understand the services and providing quality services in a timely manner.

### **ICTs and Self-Help groups (SHGs)**

The researcher conducted interviews with women belonging to the SHGs to know their perception on ICTs uses and the e-governance services. The women SHG members talked more about the programme named ‘Mission Shakti’ which is a women empowerment initiative launched by the Government of Odisha launched in 2018.

The mission aims to empower women by making them financially self-reliant and socially empowered. ICTs has played a crucial role in the success of Mission Shakti. Under this programme a digital platform has been created to connect women SHGs with banks, marketplaces, and other financial institutions. This platform enabled SHGs to access credit, market their products, and participate in online auctions, among other things. The Government of Odisha has developed mobile applications for SHGs to manage their savings and loan accounts, access training materials, and receive updates on various government schemes. These apps have helped SHGs to become more financially and digitally literate.

Due to its proven effectiveness, the ICTs based initiative for SHGs is gaining prominence in rural Odisha. The SHGs are now an integral part of the online digital community. Women in SHGs, and especially women entrepreneurs have benefited from technology's empowering effects by using the internet to market their goods on a global scale. As a result of the ICTs

based platforms the SHG members are marketing their products globally using social media sites like, Facebook, WhatsApp, YouTube and courier services to distribute and deliver them.

Kabita Sahoo (33) an SHG member remarked,

*the internet is a great boon for women who are interested in weaving or sewing and want to improve their ideas or designs. Tutorials on YouTube or any of the other video platforms that are available online could be of assistance in this regard. From our group two women are learning to make wickers basket learning through online sources. ICTs are thus helping us in many ways. We have a private WhatsApp group of 12 members and in that we share our important meetings and weekly schedules. The tools become a problem sharing and solving platform during the times of need.*

Sarita Muduli (28) is a member from 'Maa Bhabani SHG'. She has completed her higher secondary in arts and her husband is working in Tata Steel company. Sharing her experience, she observes that,

*I know how to operate a computer and I have done a course in computers. So, I am helping out all the other members who are not aware about how to operate computers. During the Covid period I did all the online transactions and helped out the women from our SHG community. Through internet banking I can access our group bank account and share the information in the group meeting. The ICTs based e-governance is reachable to me with a finger touch. From my home I can assess the services and apply the services launched by the state government. During Covid time many women took the appointment for tele-medicine through my computer. Tele-medicine helps out during emergencies and many old women take the online consultation during the lockdown and restrictions. I have applied for Bank Mitra which will help to reach out to the remotest region and I want to work for the rural people.*

Another woman respondent named Neekita (34) has explained her experience after using social media

*I have opened a Facebook account recently. I occasionally upload photos and connect with childhood friends online. My son taught me how to use it. I am also using WhatsApp to communicate in our SHG group. Initially, it was very difficult for me to operate but now it is not difficult for me to use. My command of the English language is limited as a result, when I use WhatsApp, I use the Odia keypad. My son set up the Odia keypad for*

*me. Family is crucial in assisting a woman to overcome her fear of using a smart phone. I have overcome that fear to a large extent thanks to my husband and son, who encourage me to use technology.*

A majority of women expressed difficulty as a result of existing orthodox beliefs and bias against women in using smartphone. Outdated mentalities are frequently cited as the most significant barrier to women's use of communication technologies

According to a member of SHG,

*I think that most women in society, especially older women who were born when the digital transformation was still in its early stages, are now digitally excluded. But young women today are also left out of the digital world because technology is stereotyped as masculine and is to be used by men alone. This makes most women feel less confident and less interested in learning digital skills, even at a young age.*

### **ICTs and Social Transformation**

The former Sarpanch of Dinkia panchayat, Saliala Nayak (52 years of age) explained about the village transformation in the last decade and the changing approach of villagers after the implementation of ICTs in everyday life. Twenty years ago, he said, the area was devastated severely due to the Super Cyclone of 1999. It made the landfall near Ersama on October 29, 1999. The cyclone caused widespread destruction, resulting in the loss of thousands of lives and causing significant damage to infrastructure and the economy of the region. But now the Ersama block has changed and several development projects have been implemented since then. Now the state government implemented various measures to improve cyclone forecasting and warning systems, strengthen infrastructure, and enhance community resilience. This included the construction of cyclone shelters and embankments, as well as the establishment of early warning systems to minimize the impact of future cyclones.

Earlier, for availing any e-governance services people used to wait more than four to six weeks, even for a caste or income certificate. The middlemen and political power people were the intermediaries between the state and citizens and used to take bribes for every work. Due to this, poor people used to spend a lot of money to get their entitlement and were completely dependent upon the mercy of the middlemen. However, the power dynamics have changed after the introduction of e-governance. Due to the ICTs implementation in the governance and the dissemination of services through the CSC and information from electronic media such as

social media, people are more aware than before regarding the services and benefits that can be availed from the CSC.

He further adds,

*I strongly believe that society benefits when women learn to use ICTs enabled services. For example, if a mother is familiar with internet usage, she can educate her family members, particularly her children, on how to use it. Women learning technology has far-reaching social benefits to know about services related to e-governance. Furthermore, when women use ICTs, they gain confidence. There is a huge gender gap in the field of technology and most of the women are deprived from taking the benefits of e-governance. There are no women VLEs in our region which is one of the major concerns for gender-friendly common service centre. If a women will run the centre, it will be more convenient for many women to avail the e-governance services. Many women never heard about the CSC and the benefits provided by the state. Successful women might inspire other women to follow in their footsteps and make wise decisions in their life.*

## **Conclusion**

This chapter analysed and discussed data from the field along the lines of analytical categories such as gender, caste and everyday use of ICTs and their accessibility. It also presented the narratives of respondents and highlighted the lived experiences with ICTs enabled CSCs in availing government services.

The role of ICTs is gaining prominence not just in urban society but in rural society as well. The ICTs are shaping the way people interact with each other, work, learn, and entertain. ICTs can be seen as a tool for reducing the digital gap between rural and urban and also for providing accessibility in remote locations. Common service centres are set up to provide e-governance facilities to citizens, mostly in rural areas, with an aim to minimise the above-mentioned digital discrimination. The number of people availing the benefits from using telecentres called Mo Seva Kendra continues to rise in number in the Ersama block.

The advent of e-governance found to have brought significant changes in the study villages enabling villagers to access government services. However, there are still inadequacies like poor network, gender gap, etc. which need to be addressed to make the e-governance effective. For the benefits of ICTs to be distributed equitably and to address the social and political inequalities, it is necessary to develop infrastructure in rural areas.

## **CHAPTER 5**

### **SOCIOLOGY OF ICTs AND GOVERNANCE: PERCEPTIONS, IMPACTS AND INEQUALITIES**

The role of ICTs in the everyday life of people in general and its increasing relevance in governance in rural areas in particular is all too apparent now in this digital world. India is one of the leading countries in the world applying ICTs in governance in a big way. Several studies have reported how ICTs is changing the way rural people negotiate with state. The present chapter, based on the data collected during the field study, analyses how ICTs based governance is reaching the 'rural' and how rural users negotiate with the new technological paradigm.

The CSC centres, set up to serve as agencies to deliver state services to rural users, are emerging as the gateways to digital transformation in rural areas. This study finds that the CSCs are offering a lot of promise in terms of delivery of services and accessibility to e-governance. They have optimised the delivery of governance services in time with less cost to the users.

ICTs has become a critical component of governance in many countries. They can help state to become more transparent and accountable, improve public service delivery, and increase access to information and services. Research into the impact of ICTs on governance has found that the success of an ICTs project depends on the quality of governance in the country in which it is implemented. Countries with strong governance structures tend to be more successful in using ICTs. Furthermore, research has found that ICTs can be used to improve efficiency, reduce corruption, and increase citizen engagement with the government.

#### **E-governance initiative: Before and after the implementation**

Assessing the impacts of e-governance initiatives in rural Odisha entails examining the outcomes and effects they have on individuals, communities and institutions. This includes evaluating improvements in the service delivery, transparency, efficiency, and citizen participation. Additionally, impacts can witness to socio-economic development, empowerment, and social inclusion.

E-governance initiatives are all about making government services, processes easier to access. These initiatives involve the use of technology to streamline and automate the government processes, increase transparency and accountability, and improve the delivery of public services and access to information.

Before the implementation of e-governance initiatives, governments were often slow to respond to citizens requests as well as inefficient in their processes. For example, simple information requests, paperwork, and other tasks would often take weeks or months to process. Government departments were also often siloed, making it difficult to coordinate resources and data. Furthermore, government services were often accessible only to those in the physical vicinity of a government office or with political influence.

After the implementation of e-governance initiatives, governments were able to streamline and automate processes, making it easier and faster to access information and services. This was accomplished through the use of online portals, mobile applications and other digital solutions. These technologies allowed citizens to access information and services from anywhere, anytime, while also allowing governments to respond to citizens' requests more quickly in an efficient manner. Furthermore, transparency and accountability have increased significantly as governments were able to track requests, monitor results, and provide better reporting within a short span of working time. Additionally, government departments were better able to collaborate and share resources, leading to improved efficiency and transparency.

The implementation of ICTs based e-governance initiatives has had a positive impact on the way governments deliver services and information. By making data and services more accessible, governments have been able to increase transparency, accountability, and efficiency. Additionally, citizens have been able to access information and services from anywhere, anytime with few clicks.

E-governance greatly helps decrease the unnecessary costs associated with each level, which can save the public a huge amount of time, money, and energy. In previous versions of the governance, the primary focus has been placed on rules, regulations, and conventions, the application of which was entirely left on the official's own personal point of view of the given problem. When a degree of subjectivity is involved with, it often fosters corrupt behaviours and gives service seekers preferential treatment. E-governance practices, which are digitally driven, have contributed to the creation of an environment that is accountable, objective, and transparent and fair. Because the software that comprises e-governance are organised in such a way, it is assumed that information and services will be delivered instantly and without delay to the intended beneficiary.

## **State Welfare Schemes and Social Exclusion**

E-governance initiatives have the potential to promote social inclusion by providing equal access to government services to all citizens. However, in rural Odisha, the social inclusion aspect of e-governance has been limited due to various factors such as low literacy levels, lack of awareness, and gender-based discrimination. Women, in particular, face barriers to accessing e-governance services due to social and cultural factors. Women's mobility is restricted due to social norms, and they are often dependent on men family members to access e-governance services.

Technology has also widened the inequalities between different socio-economic groups in rural Odisha. This leaves out a significant section of the rural population who are economically and socially disadvantaged. Moreover, digital literacy rates are much lower among women, Dalits, and other marginalised groups, further exacerbating inequalities.

During the field study, the researcher interacted with beneficiaries who could not get their rations due to “technical glitches”. It was reported that the technical problem includes poor network, error in capturing fingerprints, changes in fingerprints caused by abrasions, as well as issues during “seeding” (i.e., the linkage of Aadhaar to the NFSA and SFSA ration card). The common problems are “biometric failure” (failure in recognising fingerprints) and incorrect quantities being displayed in the e-PoS devices due to the wrong data entry.

One of the most commonly reported issues with the fair price shops which provide food grains was the failure of biometric authentication, which can considerably increase the likelihood of being rejected from the welfare system. The failure to authenticate occurs in the PDS when the beneficiary places his/her finger on the machine that captures fingerprints. However, the system does not recognise it, which causes a dialogue box to appear at the top of the browser with the message that the biometric data did not match. While authentication failure usually indicates that the system was unable to read the data, many beneficiaries encountered repeated authentication attempts failures on a daily basis.

In order to prevent authentication failures with the e-PoS machine at the fair price shops, many beneficiaries visited the CSC to update their biometric information. However, several people claimed that authentication started failing again a few months after they updated the biometric information associated with their Aadhaar cards.

A beneficiary, Kisan Barik (44 years of age), in the village faced repeated authentication failures while attempting to collect his entitled ration from the PDS outlet of Dhinkia village. Despite providing his correct biometric information, the algorithms consistently misidentified Kisan, denying him access to the subsidised food grains. Frustrated, Kisan lodged a complaint with the local PDS authorities but his complaint was never addressed.

It was observed that the selection and identification of beneficiaries is done through ICTs based e-governance but the application process has been done by the local Sarpanch and the Block level officer who wield great power. The researcher came across several instances in which despite the ICTs based transparent governance the local power structure still operates. One of the respondents, Tukuni Mallick, a woman from Dhinkia village, observes,

*I am 37 years old and belong to the Pana caste, which is a Scheduled Caste in Odisha. I reside with my two daughters, and my husband has migrated to Surat, where he is employed in a company. Even though I am receiving the ration, I do not have a house of my own and instead live in a little thatched house, which makes it very difficult for my family to stay there. I have been running behind Sarpanch and Ward member and Block Development Officer requesting them to sanction me a house under the Indira Awas Yojana scheme for the last 4 years. Everyone is saying that the application process is in online mode but I have no knowledge regarding how to apply and I requested the Sarpanch. Till date I didn't get any sanction order. I made multiple attempts to get it and made requests several times but got false promises. Sarpanch says that there is no slot available online; therefore, my application will not be processed for the scheme.*

Like Tukuni Mallick other members from the same community have shared similar experiences in accessing state schemes. The respondents also reported that despite the launch of e-governance the local power structure operates at the village level. Traditional social hierarchy and power politics influence the selection of beneficiaries for any government scheme. Bijay, a respondent, says,

*You have no idea, there is a lot of politics going on in the village. I have requested several times to the Sarpanch for the ration card, but he is not listening to me and giving me false promises. This is because, I did not cast my vote for him during the panchayat election. Those people who were very close to him, and supported him during elections were able to access all welfare schemes. I applied for a ration in the panchayat Jana Seva Kendra,*

*and the VLEs told me that it has to be approved through the Sarpanch, which created confusion for me to know about the proper mechanism of getting the ration services. I have applied for the KALIA scheme online and offline, but my name is not on the list though I fulfil the state-mentioned criteria to get the scheme.*

A woman respondent who lives with her mentally challenged son, observes,

*Earlier, the PDS dealer at the ration shop used to give me 5 kilograms less than what was allotted to me. I know that I am being shortchanged. But I had the satisfaction that I was getting food grains in time. I was getting something. But after the introduction of Addhaar based food grain distribution I am facing lot of issues in the process of authentication. My fingerprint is not matching with the machine (an EPOS machine that uses fingerprints for authentication). The PDS dealer is denying me the foodgrains now.*

### **Digital Accessibility: Issues and Challenges**

Eight CSCs are working in the Erasama block, out of which two are located in Ersama and Dhinika, the study villages. In order to understand the ground-level reality at the CSCs, the researcher visited the CSCs during the working hours. It was found that the CSCs in the villages of Ersama and Dhinika are functioning effectively and meeting the needs of local residents. However, the centres are unable to provide all the necessary services because of unstable network connections and a shortage of necessary physical infrastructure.

In Dhinika and Ersama, most respondents (80 percent) use the CSC for obtaining certificates issued by the state government departments, land registrations, tax payments, etc. The most frequently used services at the CSCs are:

- Aadhaar correction
- Application for Ration card
- Certificates of various types, like, caste, income, birth, nativity, etc.
- Land registration documents
- Application for welfare services
- Pension benefit schemes
- Education services (SAMS in Odisha)
- Recharge of mobile and DTH
- Ticket booking

When digital technology becomes an integral part of daily life in most parts of society, it will alter how we work, organise, communicate, and form connections with one another. Additionally, it alters the relationship that exists between the state and its citizens, which is the relationship that is typically understood to be citizenship.

Interaction with respondents reveal that ICTs has become integral part of everyday life of rural people. All sections of the villages use CSC services. Majority of the villagers use smartphones and the internet. Social welfare schemes like Public Distribution System (PDS) and pension schemes have been streamlined through technology and the state has used technology to reach the maximum number of rural beneficiaries.

The study on ICTs and e-governance services in the Ersama and Dinkia villages of Odisha finds that technology has ushered in a digital transformation in rural areas. It is observed that the ICT-based initiatives have brought significant changes in the quality of life of rural poor. The services through CSCs helped the villagers to overcome the problem of middlemen, bribery and lack of accountability on the part of the government functionaries that prevail with the old system of governance. ICTs-led e-governance system in the study villages seems to be helping create a more efficient and transparent local administration, leading to improved services and higher levels of citizen satisfaction in availing government schemes.

The study also finds that ICTs and e-governance can be used to promote economic development in rural areas. Through the introduction of digital technologies, villages can become more connected and attract businesses, create more job opportunities and improve the livelihood of local communities. ICTs and e-governance can be used to promote social inclusion and to reduce poverty in rural areas. By making government services more accessible, ICTs led e-governance can help empowering the disadvantaged or marginalised communities and create pathways out of poverty. Overall, the study demonstrates that digital technologies can be very effective in improving the quality of life in rural areas, and that the potential of ICTs should be further explored by the state.

In the late 19<sup>th</sup> and early 20<sup>th</sup> centuries, the villages lacked even the most fundamental forms of electricity and had no communication network. Now the villages are equipped with information and communications technology and two common service centres and they have also been integrated into a social welfare service. Every household in the villages has access to ICTs; citizens are availing services through digital technology and access the government

services in online medium. There is one smartphone, on average, in each household in the villages.

The study finds that the introduction of ICTs infrastructure, including internet connectivity and mobile networks, significantly improved the village's connectivity. Majority of the respondents reported having access to mobile phones and internet, allowing them to connect with the outside world. This increased connectivity facilitated communication, information access, and online platform participation. The study finds that villagers widely use smartphones, social media platforms, and instant messaging applications to connect with family, friends, and fellow villagers. This connectivity fostered social cohesion, strengthened community ties, and facilitated knowledge sharing and exchange of experiences. More than ninety percent of respondents have a smartphone or feature phone in their house.

A respondent named Prafulla Muduli, 38 years old, is a daily wage labourer of Ersama village. He has availed benefits of several schemes of the state government, under MGNREGA, KALIA and NFSA scheme. The wages and the financial assistance from different schemes are credited directly to his bank account under the direct benefit transfer. He stands out as a real beneficiary of the JAM which the government is promoting in a big way. He has opened the Jan Dhan account in the bank, linked his Aadhaar with his bank account and his Aadhaar and bank account are linked with his mobile number. He expresses satisfaction about the ICTs based governance initiatives offered through the CSC in the village.

*I am impressed by the speed, ease of operation and convenience in receiving the DBT amount transferred to my account by the government. Previously, the same task would take me one or two days and a lot of effort, as the bank is located 15 kilometers away from my village. Sometimes the bank is crowded and there are long queues to withdraw money. I used to spend about Rs. 100 to go to the bank to withdraw money from my account. I faced similar issues with other services as well. However, there are challenges in the CSC system also as the network connectivity is poor.*

Financial inclusion through technology in the village has become increasingly important over the past decade. The shift to digital payments, such as mobile wallets and electronic bank transfers, has made it easier for people in rural areas to access financial services. This has allowed them to save time, money and resources and improve their quality of life. The CSCs equipped with computers, internet connections, and other digital tools allowed villagers to

access a range of financial services, such as digital savings accounts, money withdrawals and online transactions.

Banaka Bhaina, 43 years old grocery shop owner, shares his experience about the online transaction and how digital payments have become big hit with his customers,

*My shop is more than 30 years old. I have an account in the Punjab National Bank located at Ersama village. I linked the account with Google Pay, Paytm and PhonePe. My customers these days use digital payments and the money is directly credited to my bank account.*

Based on the data collected from the respondents it may be said that 82 percent of the respondents have availed ICTs led e-governance services through the CSCs in the two villages. Among the users BCs come first and SCs come next. Kailasha Sethi, one of the respondents, points out that,

*I belong to a Dalit family of Dhinika village. I work as a labourer in the village. I have no mobile phone and I depend upon the common service centre for availing government services. The CSC is three kilometres away from my village. I go to the centre by cycle. Recently I applied for e-Shram card at the CSC for which they took my Aadhaar card and finger print for verification. They charged one hundred rupees. After about two days I got my card. I have a ration card; I draw the ration from the rationawala every month. Recently I got ten kilograms of rice and one kilogram chana dal.*

Before the advent of ICTs based CSCs the situation was difficult for the poor. Due to lack of access and awareness poor were excluded from the government schemes. Simple request for a certificate used to take several months. The findings of the study suggest that the ICTs led CSCs brought about significant changes in poor people's interaction with state for various state services.

### **Digital Inequalities and Digital Divide**

Digital inequalities refer to the disparities in access to and usage of digital technologies among communities. The digital divide refers to the gap between those who have access to the internet and technology and those who do not. ICTs is often negotiated in existing rural social milieus that are characterised by social, cultural, political, and economic inequalities. The

usage of ICTs led governance initiatives can be influenced by the existing social, cultural, political, and economic contexts. These contexts can affect the way in which ICTs is perceived and used by people in rural areas, and can impact the success of ICTs led governance initiatives.

Social inequalities refer to differences in social status, access to resources, and power between different groups of people. In rural areas, social inequalities manifest in many ways, such as differences in education, income, and social networks. These differences can make it difficult for some people to access ICTs and can lead to unequal outcomes.

The narratives from the field suggest that individual's social and cultural capital plays an important role in accessing government services. The ICTs led governance promises to offer solution to these inequalities between those who have social and cultural capital and those who don't. The findings of the study suggest that despite the technological intervention the social and cultural capital play an important role. In rural Odisha, power dynamics continue to influence the implementation of e-governance initiatives. The local bureaucracy and political leaders often control access to e-governance services and use them for their own benefit. This has led to the exclusion of marginalised communities from accessing e-governance services.

### **The New Middlemen**

Middlemen have historically played a key role in the reach of social welfare schemes in rural areas, particularly in the distribution of government benefits and subsidies to the needy. Their involvement has been a subject of debate due to issues of corruption, inefficiency and exclusion of the intended beneficiaries.

Have ICTs led e-governance initiatives eliminated middlemen who used to control access to government services in the rural areas? Has the technology-based efforts reached the marginalized sections with ease? These are some of the questions the researcher tried to inquire during the study. The study finds that the role of middlemen has not been completely eliminated. However, the role has come down just to the selection of the beneficiaries now. Earlier the role of the middlemen, who are political representatives, persons who have connections with the local officials, elected representatives, etc. was very important. One could not bypass middlemen to avail any government service. With the ICTs led governance the poor and the needy are able to apply without the intervention of the middlemen. Now they go to the CSC and ask the CSC employee to fill the form online for a specific service, for example, new

ration card or application for house, etc. and authenticate using Aadhaar. Earlier, even the applications were not made available to the needy. Those who are close to the middlemen used to get the chance to apply.

ICTs is now facilitated direct communication between citizens and government agencies, reducing the need for intermediaries in certain government services. For example, online portals for caste certificate application, utility bill payments, government schemes allow citizens to directly interact with government systems, bypassing traditional middlemen. This has the potential to eliminate middlemen in those much-needed specific areas.

However, ICTs is not completely disintermediated traditional middlemen. New form reintermediation was observed in the study. The middlemen found opportunity to intervene at the end stage, i.e., at the level of selection of beneficiaries. Due to lack of digital literacy lower caste, women, and old age people face challenges in accessing the online services. The study finds that the middlemen who volunteer to serve these sections of citizen do ICTs based transactions for a price. The needy person is also ready to pay to these middlemen who mediate between the citizen the state through technology. The middlemen are well-versed with technology and they own infrastructure like smartphone, printer, etc.

At the same time the local traditional power structure still operates. This power structure, using the influence of political position often misguide the poor from the marginalised sections who don't have social capital. For example, it was reported by the respondents during the field work that the political representatives at the local level sell application forms for different schemes of the government. Application for PM Awas Yojana scheme costs Rs. 1,000-2,000; for Toilet scheme Rs. 500-1,000 under Swaacha Bharat Mission; for land registration certificate Rs. 100-500 certificate; for ration card Rs. 100-500, for job card under MGNREGA Rs. 100-300, for e-Sharm card Rs. 50-100. Interesting observation is that the forms are available online for free, but the poor, who are not aware, often buy the physical forms from these political representatives.

### **Social Networks and Relationships**

CSCs in Ersama and Dinkia were observed to be emerging as common meeting points and social hubs where users socialise. The face-to-face interactions between the service users who come to the CSCs foster a sense of community belonging, trust, and cooperation among

villagers. These social networks play a crucial role in disseminating information, sharing experiences, and collective decision-making processes related to the CSCs.

For instance, during the field work the researcher observed that few farmers, while waiting for their turn at the CSC, engage in casual conversations with each other. They exchange knowledge about crop cultivation techniques, discuss pest control measures, exchange information about new government schemes and share their experiences with different farming practices. Meeting acquaintances at the CSC was observed to be a great joy for the users who come to the CSC for some service.

In the case of youth, the social networks formed at the CSC extend beyond the physical space. They exchange phone numbers and establish contacts with each other as they become friends during their short interaction at the CSC. They become members of common WhatsApp groups, and other social media platforms. They establish virtual social networks, allowing them to stay connected, sharing updates and seeking assistance. CSCs thus became gathering places and hubs for social interactions between the known and unknown persons.

### **ICTs Network**

In addition to strengthening village sociality, the proliferation of ICTs and smartphones have also strengthened the kinship structure. Data suggests that a large majority of the respondents make calls to relatives and friends. Smartphones are used mostly for entertainment and calling purposes. The maximum number of calls are made to the members of their kin group, and thus, it was reported by the respondents that smartphones have intensified the kinship bonding as well as friendship bonding. Villagers are able to keep in touch with relatives who have migrated to outside districts or even outside states.

Before the advent of smartphone in the village, geographical distance often limited regular interactions between family kin group members and friends. However, mobile phones have bridged this gap by enabling virtual connections. Smartphones further strengthen the bonding by enabling video calling facility. Respondents have reported that they now communicate through voice calls, video calls, messaging apps, and social media platforms. This has significantly reduced the impact of physical separation on kinship networks, allowing families to stay closely connected irrespective of their location.

The study finds that smartphones have revolutionised communication by enabling individuals to stay connected with their family members, even over long distances. This has led to

increased frequency and ease of communication among family members, regardless of geographical locations. As a result, kinship ties have become stronger, and people can maintain closer relationships with their extended family members.

### **ICTs and Digital Transformation**

The advent of ICTs and digital technology has revolutionised the way rural communities connect with each other and access information. Previously, rural areas were often characterised by limited access to resources, poor geographic separation and lack of connectivity. However, with the introduction of digital technology, such as smartphones and the internet, these communities now have the means to overcome physical barriers and establish virtual connections.

It was observed that in the Ersama village the people are using smartphones extensively. For example, the farmer who is a tech-savvy would get to know the modern, efficient farming practices by watching videos on social media and shares such knowledge with other farmers. Thus, knowledge dissemination is taking place cutting across geographical boundaries. Knowledge on weather conditions, weed control, crop and pest management are reaching the farmers faster than before. It was observed in the study that farmers have created their own WhatsApp groups to share such information. One such group is *Krusha Suchana*, WhatsApp group with 14 farmers as members. This virtual social network creates a sense of community feeling and facilitates the exchange of valuable information. Similarly, SHG members and the youth have created their own WhatsApp groups in the study villages.

Integration of Aadhaar, a biometric identification system, with welfare schemes, helps streamline beneficiary identification and verification processes, reducing the reliance on middlemen for targeting and distribution.

It was observed in the study that Aadhaar provides the villagers a formal identification document, which is crucial for accessing various government schemes, entitlements, and services. It enables them to establish their identity and avail benefits like subsidised food grains, healthcare, education, education scholarships and financial services. Many social welfare schemes initiated by the government require Aadhaar for beneficiaries to get benefits. Aadhaar ensures targeted delivery of these services, reducing corruption and ensuring the intended beneficiaries receive the benefits.

It was observed during the field study that all the beneficiaries are possessing two to four cards, viz, Aadhaar, FPS card, employment card, etc. and their photocopies. It was also observed during the visit to the CSC by the researcher that the villagers compulsorily carry these cards whenever they go to CSC for any government related work. The digital cards have become essential part of everyday life of rural people.

### **Gender and Digital Divide**

Gender disparities in accessing ICTs infrastructure, including internet connectivity, smartphones, computers, and other devices, can limit women's ability to benefit from ICTs. In many regions, women may have limited access due to factors such as affordability, lack of infrastructure in rural areas and various other social and cultural norms restricting women's access to technology.

During the interviews and observations in the field, the researcher found that women rarely use ICTs. Due to the social stigma attached to women going out alone without being accompanied by any male member of the family it was reported that many women don't access the CSC despite being capable of handling issues alone. Rather, they depend on men in the family, like husband or sons. The patriarchal notion that men handle outside works and women should confine to household chores influences ICTs use by women. These deeply embedded cultural norms hinder women from exploring the possibilities offered by digital services and ICTs, thus perpetuating the gender digital divide. It was also found in the study that there are no women VLEs handling CSCs in the region. Both the CSCs in the study villages are run by men VLEs.

## **CHAPTER 6**

### **CONCLUSION**

India is on the threshold of ICTs revolution. The proliferation of digital technology and computer networks has brought with it the accompanying necessity of learning to adapt to the impending changes and improvements in technology. Digital India is an umbrella term that covers a wide variety of initiatives and platforms with the goal of utilising information technology as a driving force for societal digital transformation and empowerment.

ICTs and governance have enabled state and citizens to interact more efficiently and effectively with each other. ICTs has enabled governments to improve timely service delivery, increase transparency and accountability, and provide access to information and services. It has also enabled citizens to participate more actively in public decision-making and to hold their governments accountable for any default found within.

ICTs and new media technologies are now considered vital components of e-governance. E-governance is widely recognised as a critical component in administrative reforms and the enhancement of interactions between citizens and the government. The importance of ICTs in governance is gaining increasing recognition all over the world as a powerful tool that has the potential to provide inclusive governance. E-governance has the potential to improve the performance of the public sector and raise the quality of public service delivery.

The sociological understanding of ICTs in governance recognises that technology is not neutral but shaped by social, cultural, and political factors. It acknowledges that ICTs are not simple tools used by governments, but that they have socio-cultural and institutional implications that impact various aspects of governance and its governed. The social impact of ICTs in governance explores how ICTs affect social inclusion, equity, and social justice. It studies whether the digital divide is being bridged or exacerbated by ICTs initiatives and explore how marginalised groups, such as poor, dalits, women and aged are affected by the implementation of ICTs based governance initiatives of the state.

The present study attempted at a critical examination of ICTs in governance, the ways in which these technologies influence social structures, relationships and power dynamics in the rural context. It involves analysing social implications, interactions and outcomes that emerge from the integration of ICTs in governance processes. By applying a sociological lens, the study

attempted to explore the broader social context of e-governance and understand the complexities of ICTs-enabled governance in a rural setting.

Digital technologies have transformed communication in villages, enabling easy and affordable access to mobile phones, internet connectivity and social media platforms. This has bridged the communication gap between villages and the rest of the world, allowing villagers to connect with family members, access information, and participate in online communities. ICTs has significantly improved access to information in rural Odisha. Villagers can now access news, educational resources, agricultural information and government schemes through mobile phones and internet connectivity. This has empowered them with knowledge and information like never before.

The present study examined how ICTs facilitate the creation of networks, enabling the rapid dissemination of information and the formation of online communities. The analysis reveals that these networks can influence governance processes by shaping public opinion, mobilising collective action, and fostering new forms of social and political engagement among citizens.

The study explored the social construction of technology and its implications for governance. The findings highlight that technological choices and implementations are not neutral but are influenced by societal factors, including power dynamics, cultural beliefs, and institutional arrangements. The study uses the researcher's experience at the CSC to demonstrate how ICTs, through the establishment of a centralised service centre, enable state services to reach the rural communities. It promotes digital access, empowers citizens, fosters social inclusion, and strengthens local economies.

The relationship between ICTs and governance is dynamic and reciprocal. ICTs both shape and are shaped by social structures, norms, and practices within governance systems. This interplay influences how ICTs are utilized, the impact they have on governance processes, and how governance structures respond and adapt to the influence of ICTs.

Social structures and norms influence the development and design of ICTs. Technological advancements are driven by societal needs, values, and aspirations. For example, the demand for greater transparency and accountability in governance has led to the development of digital platforms for open source data sharing and citizen engagement. Similarly, social norms around privacy and security shape the design of ICTs systems to protect sensitive information.

ICTs also shape governance systems by enabling new modes of participation, decision-making, and accountability. The availability of digital platforms and social media allows citizens to engage with governments, voice their opinions, and participate in policy-making processes. This transforms traditional power structures and can lead to more inclusive and participatory governance practices.

The CSC facilitates social inclusion by ensuring that all members of the rural community, including marginalised groups, have equal access to government services. For instance, elderly individuals who may face challenges with digital technology can receive assistance at the CSC, enabling them to access relevant state services and benefits. This ensures social equity and empowers citizens to exercise their rights and avail themselves of government resources.

Norms and practices within governance systems influence how ICTs are adopted and utilised. Existing power structures, bureaucracies and institutional norms may resist or shape the implementation of ICTs. Additionally, cultural norms, predefined gender roles and other factors such as trust in digital systems or attitudes towards technology, can affect the acceptance and utilisation of ICTs in governance processes.

Aadhaar has redefined the concept of digital identity in India. The emphasis on Aadhaar as proof of identity has created a paradigm shift in how individual is understood and perceived by state. This shift raises questions about the relationship between the state and its citizens, as Aadhaar becomes a determinant of one's status and entitlements in availing various government services. Moreover, linking Aadhaar to various government schemes blurs the boundaries between citizen, entitlement and governance.

The study finds that Aadhaar authentication is posing a hurdle in the study villages. Aadhaar has inadvertently resulted in exclusion and marginalisation. The process of enrolling for Aadhaar often poses challenges for vulnerable groups, such as the elderly, illiterate, poor, women and those without proper documentation. Moreover, technical glitches and errors in the Aadhaar system have led to instances where individuals are denied access to essential services due to authentication failures. This exclusionary impact has serious sociological implications, perpetuating social inequalities and exacerbating the marginalisation of already disadvantaged groups.

The increased power dynamics wielded by the state through Aadhaar raises concerns about the potential abuse of authority. The centralised nature of Aadhaar allows the state to monitor

individuals' activities and transactions, leading to heightened surveillance creating a threat to right to privacy. Again, this kind of surveillance not only invades personal privacy but also creates a climate of self-censorship, stifling dissent and curbing individual freedoms. The ability of the state to track and monitor citizens through Aadhaar raises profound questions about the erosion of privacy and the delicate balance between security and personal autonomy.

The government established CSCs aim to give people in rural areas access to a variety of digital services, e-governance, and skill development. CSCs have been tasked with the responsibility of providing access to ICTs led e-governance services to rural citizens. CSCs have enabled rural users to make digital payments and mobile banking. By providing access to state, the CSCs have contributed to the state's policy on digital inclusion among rural citizens. The e-governance initiative facilitated social inclusion by bridging the information gap.

Accessing e-services through ICTs involves using technologies such as the internet, mobile phones, and computers to access and use digital services. This can include activities like online banking, shopping, using government services, and smartphone. This type of access allows individuals to perform services and activities more quickly, efficiently, and conveniently, as well as to access services that may not be available otherwise. Additionally, the use of ICTs for accessing e-services can make services more secure, cost-effective, and reduce paperwork.

### **ICTs and Social Inequality**

ICTs has the potential to reduce social inequality by enabling the poor to access state services offered on e-governance platform. This can help bridge the digital divide and provide access to information and resources to the marginalized communities. Various online portals, smartphone applications, government websites and CSCs enable rural citizens to find information about the state supported social welfare schemes, entitlements, and other welfare programmes. This enables marginalised people to obtain social benefits, apply for government programmes, and exercise their rights without encountering severe obstacles. ICTs help improve communication and coordination between communities and government institutions, allowing for more effective service delivery and response to community needs.

ICTs help increase the social inclusion of marginalised and vulnerable communities, giving them access to digital services, such as online banking, health care, and government services. Additionally, ICTs can provide access to educational and job opportunities that can enhance economic and social development in the communities.

ICTs help people to create new identities, which can be used to explore and express different aspects of their personalities. This has enabled people to form relationships, regardless of geographic distance. New modes of social engagement and identity construction have emerged as a result of the proliferation of digital technologies, in particular the internet and social media. It is providing individuals with new means of communication, expression, and self-presentation. Popularisation of social media led to an increase in individual expression and self-expression, and a wider range of social identities. Digital technology is becoming a part of everyday life, and having a deep and growing effect on society, politics, and the economy.

Various social media platforms such as Facebook, Twitter and Instagram have become an important part of rural people's lives as well, providing them with new ways to communicate with friends, family, and even new social friends. It was observed in the study that all youth in the villages use social media. They have created their Facebook, Instagram, etc accounts and are being part of wider social network. They are able to search for information they want and share it with others in the groups as well. They use Google to search for answers or clues for the problems they come across. They also mentioned that they use google to know about the government initiatives. They also become aware of the government schemes through mobile news, YouTube videos, Instagram reels, Facebook, etc. ICTs is able to provide young people with innovative approaches to express themselves through video and music and display their talent over social media.

Digital technologies provide individuals with new means of self-expression, allowing them to showcase their personalities, interests, and opinions to a wider audience in real time. This self-expression can be a powerful tool for identity formation, as individuals can use it to explore different aspects of themselves and connect with others who share similar interests and values. Digital technology is becoming a part of everyday life, and having a deep and growing effect on society, politics, and the economy.

ICTs has enabled people to connect with one another in ways that were not previously possible and have allowed for the emergence of new forms of communication, interaction, and collaboration. ICTs has also enabled the emergence of new networks of power and influence, and have given rise to new forms of governance. At the same time, ICTs has also been used to promote social change and to empower individuals and communities. By making information and communication more accessible, ICTs are helping to create new opportunities for

economic and social development and to reduce inequality. ICTs also offer a platform for people to share their experiences and to advocate for causes that are important to them.

One example of how ICTs restructure the social order in rural Odisha is through the adoption of mobile banking and digital payment systems. Previously, the villagers of Ersama primarily relied on cash transactions for their daily economic activities. However, the arrival of digital payment systems brought about a significant change. People now use Google Pay and Paytm for daily transactions. As the banking services are being offered in the CSC, the villagers are no more burdened to go to the bank located far off from their village. The beneficiaries are able to receive payments, deposit or withdraw money, and make transactions through the CSC.

Manuel Castells theory of the network society suggests that contemporary societies are characterised by the emergence of a new type of social organisation based on networks of communication and information. This new form of social organisation is facilitated by advances in technology and is transforming the way people live and work. This theory examines how the development of new technology has led to the formation of a new social order, consisting of networks of people and organisations that are increasingly interconnected and interdependent on one another. Castells argues that digital technologies like social media have significantly contributed to the emergence of a new social order, global economy, and virtual culture.

The study finds that people across caste in the study villages use ICTs, overcoming the traditional barriers of communication and accessing government services. In the past, the village was primarily organised around traditional social institutions such as the family, caste, and religion. Communication was limited to face-to-face interactions; news and information spread slowly through the community. However, with the increasing adoption of mobile phones, ICTs-led services and the internet, the villagers are now well-connected and exchange information in real-time using social media platforms such as WhatsApp, Facebook, Instagram, and YouTube. This has made it easier to build new social networks based on common interests and activities.

For example, the functioning of women's self-help groups in the Ersama village has been facilitated by the use of social media platforms. Women are now able to communicate and coordinate their activities more efficiently, enabling them to undertake collective economic activities such as farming and marketing. Information about the availability of resources and

services can be quickly disseminated through social media platforms, enabling villagers to access these resources more efficiently.

The increased access to information and communication has enabled individuals to forge new identities based on shared interests rather than on traditional social institutions. The findings of the present study corroborate Manuel Castells's theory of the network society. The emergence of new social networks based on shared interests and activities is transforming the way people live and work, challenging traditional social institutions and facilitating new forms of social organisation.

The study finds that use of ICTs has improved the delivery of public services in Odisha. The state has implemented several e-governance initiatives, including the digitisation of existing as well as new land records, online registration of births and deaths, and the provision of online services for various government departments. These initiatives have reduced the time and cost of service delivery and increased access to services, especially for those in rural areas.

The study also finds that the use of ICTs has increased transparency and accountability in governance. The Odisha government has implemented several online portals and mobile applications that provide citizens with access to government information and services. These platforms have made it easier for citizens to track government spending, monitor the progress of projects, and file grievances. The study finds that these platforms have increased citizen participation in governance and strengthened the relationship between citizens and the government.

However, the study also finds several challenges associated with the use of ICTs in governance. One of the primary challenges is the lack of digital literacy among citizens, especially among the poor, women and elderly. Many citizens do not have access to internet, and those who have access, often lack the skills to use online platforms effectively. This limits the potential impact of ICTs on governance and reduces their ability to engage with the government and the lack of infrastructure and connectivity in many parts of the state. Both the villages, Dinkia and Ersama, do not have access to high-speed internet, which limits the citizen ability to use online platforms effectively. Additionally, power outages and poor network coverage further limit the potential impact of ICTs on governance. The most vulnerable are the marginalised groups as they are excluded to get their entitlement due to various issue like errors in Aadhar and other technical problems.

The study finds that ICTs has created a positive impact on the efficiency and effectiveness in the delivery of state services and has improved the transparency and accountability of government. However, there are also concerns that ICTs can lead to surveillance erosion of public's privacy and centralisation of power.

However, addressing challenges such as the digital divide, privacy concerns, and digital literacy is crucial to ensuring inclusive and equitable access to the benefits of ICTs. By recognising the sociological dimensions of ICTs implementation and considering the unique context of rural Odisha, policymakers, government agencies, and civil society organisations can foster a more inclusive and responsive governance framework that empowers rural citizens and facilitates their active engagement in the decision-making processes.

## **Conclusion**

In Odisha the government has taken up several e-governance initiatives to take state welfare measures close to the needy where they stay, i.e., village by establishing ICTs based CSCs. The establishment of ICTs based CSCs has enabled rural people to connect to access information on government schemes and avail. The study highlights the sociological aspects that influence the adoption and implementation of ICTs in rural communities. This thesis provides insights for policymakers, development organisations, and community leaders to design and implement initiatives that harness the power of ICTs to drive sustainable development in villages in India.

\*\*\*

## REFERENCES

- Addo, A., & Senyo, P. K. (2021). Advancing e-governance for development: Digital identification and its link to socioeconomic inclusion. *Government Information Quarterly*, 38(2), 101568.
- Bakardjieva, M. (2005). *Internet society: The Internet in everyday life*. SAGE Publications.
- Barnes, B., & Edge, D. O. (1982). Science in context: Readings in the sociology of science.
- Behera, T. (2020, February 25). *Odisha creating ecosystem to become ICTs investment destination*. Economic Times.  
<https://government.economictimes.indiatimes.com/news/digital-india/odisha-creating-ecosystem-to-become-ict-investment-destination-tusharkanti-behera/74278010>
- Ben-David, J., & Sullivan, T. A. (1975). Sociology of science. *Annual Review of Sociology*, 1(1), 203-222.
- Bertot, J. C., Jaeger, P. T., & Grimes, J. M. (2010). Using ICTs to create a culture of transparency: E-government and social media as openness and anti-corruption tools for societies. *Government Information Quarterly*, 27(3), 264-271.
- Bhatnagar, S. (2004). *E-government: From vision to implementation-A practical guide with case studies*. SAGE Publications.
- Bhatnagar, S. (2009). *Unlocking e-government potential: Concepts, cases and practical insights*. SAGE Publications.
- Bhatnagar, S. C., & Singh, N. (2010). Assessing the Impact of E-government: A Study of Projects in India. *Information Technologies & International Development*, 6(2), pp-109.
- Bijker, W. E. (1987). *The social construction of Bakelite: Toward a theory of invention* (pp. 159-187). Cambridge, MA: MIT Press.
- Bijker, W. E. (1997). *Of bicycles, bakelites, and bulbs: Toward a theory of sociotechnical change*. MIT press.
- Bijker, W. E. (2001). Understanding technological culture through a constructivist view of science, technology, and Society. In S. H. Cutcliffe, & C. Mitcham (Ed.), *Visions of*

- STS. *Counterpoints in science, technology, and society studies* (pp. 19-34). State University of New York Press.
- Bijker, W. E. (2012). Social construction of technology. In Jan Kyrre Berg Olsen Friis, Stig Andur Pedersen & Vincent F. Hendricks (Ed.), *A companion to the philosophy of technology*. Wiley-Blackwell.
- Bijker, W. E., & Law, J. (Ed.). (1994). *Shaping technology/building society: Studies in sociotechnical change*. MIT press.
- Bijker, W. E., Hughes, T. P., & Pinch, T. J. (1987). The social construction of technological systems. New directions in the sociology and history of technological systems. *Cambridge (Mass.) London*.
- Boeri, N. (2016). Technology and society as embedded: An alternative framework for information and communication technology and development. *Media, Culture & Society*, 38(1), 107-118.
- Bourdieu, P. (1984). *Distinction: A Social Critique of the Judgement of Taste*. London, Routledge.
- Bresnahan, T. F., Brynjolfsson, E., & Hitt, L. M. (2002). Information technology, workplace organization, and the demand for skilled labor: Firm-level evidence. *The Quarterly Journal of Economics*, 117(1), 339-376.
- Bucchi, M. (2004). *Science in society: An introduction to social studies of science*. Routledge.
- Burgess, E. (1925) 'The growth of the city', in *The City: Suggestions for Investigation of Human Behavior in the Urban Environment*, eds R. Park & E. Burgess, University of Chicago, Chicago, pp. 47–62.
- Callon, M., Rip, A., & Law, J. (Eds.). (1986). *Mapping the dynamics of science and technology: Sociology of science in the real world*. Springer.
- Carswell, G., & De Neve, G. (2022). Transparency, exclusion and mediation: how digital and biometric technologies are transforming social protection in Tamil Nadu, India. *Oxford Development Studies*, 50(2), 126-141.
- Castells, M. (1996). *The information age: Economy, society and culture* (3 volumes). Blackwell, Oxford, 1997, 1998.

- Castells, M. (2000). Materials for an exploratory theory of the network society. *The British Journal of Sociology*, 51(1), 5-24.
- Castells, M. (2000). Toward a sociology of the network society. *Contemporary Sociology*, 29(5), 693-699.
- Castells, M. (2002). *The Internet galaxy: Reflections on the Internet, business, and society*. Oxford University Press.
- Castells, M. (2011). *The rise of the network society*. John Wiley & Sons.
- Cecchini, S., & Scott, C. (2003). Can information and communications technology applications contribute to poverty reduction? Lessons from rural India. *Information Technology for Development*, 10(2), 73-84.
- Census India (2011, June) *District census handbook Jagatsinghpur*.  
<https://cdn.s3waas.gov.in/s3eba0dc302bcd9a273f8bbb72be3a687b/uploads/2016/09/2018051058.pdf>
- Chaudhuri, B. (2021). Distant, opaque and seamful: Seeing the state through the workings of Aadhaar in India. *Information Technology for Development*, 27(1), 37-49.
- Cutcliffe, S. H. (2000). *Ideas, machines, and values: An introduction to science, technology, and society studies*. Rowman & Littlefield.
- Cutcliffe, S. H., & Mitcham, C. (Eds.). (2012). *Visions of STS: Counterpoints in science, technology, and society studies*. State University of New York Press.
- Department of Technology. (2023, March). *Monthly Telecom Scenario*  
[https://dot.gov.in/sites/default/files/MTS%20April%202023\\_0.pdf](https://dot.gov.in/sites/default/files/MTS%20April%202023_0.pdf)
- Dhal, S. (2020). Situating digital India mission in pursuit of good governance: A study of electronic governance initiatives in the Indian province of Odisha. *Indian Journal of Public Administration*, 66(1), 110-126.
- Dijk, J. A. G. M. (2013). A theory of the digital divide. In M. Ragnedda, & G. W. Muschert (Eds.), *The digital divide: The internet and social inequality in international perspective* (pp. 29-51). (Routledge advances in sociology; Vol. 73, No. 73). Routledge.
- Dijk, J. V. (2020). *The network society*. SAGE Publications.

- DiMaggio, P., & Hargittai, E. (2001). From the 'digital divide' to 'digital inequality': Studying Internet use as penetration increases. *Princeton: Center for Arts and Cultural Policy Studies, Woodrow Wilson School, Princeton University*, 4(1), 4-2.
- DiMaggio, P., Hargittai, E., Neuman, W. R., & Robinson, J. P. (2001). Social implications of the Internet. *Annual Review of Sociology*, 27(1), 307-336.
- Drèze, J., & Khera, R. (2013). Rural poverty and the public distribution system. *Economic and Political Weekly*, 48(45-46), 55-60.
- Drèze, J., & Khera, R. (2017). Recent social security initiatives in India. *World Development*, 98, 555-572.
- Drèze, J., Khalid, N., Khera, R., & Somanchi, A. (2017). Aadhaar and food security in Jharkhand: Pain without gain? *Economic and Political Weekly*, 52(50), 50-59.
- Dutta, S., & Prabhakar, T. (2007). The diffusion of ICT and e-governance in India: An empirical assessment. *The Journal of Community Informatics*, 3(1).
- Dwivedi, A., Pant, R. P., Khari, M., Pandey, S., Mohan, L., & Pande, M. (2019, March). E-Governance and Big Data Framework for e-Governance and Use of Sentiment Analysis. In *International Conference on Advances in Engineering Science Management & Technology (ICAESMT)-2019*, Uttarakhand University, Dehradun, India.
- e-Bitaran Odisha. (2015, October). *Implementation of National Food Security Act 2013 Odisha* [http://www.foododisha.in/Download/NFSA\\_Brochure.pdf](http://www.foododisha.in/Download/NFSA_Brochure.pdf)
- Edge, D., Harré, R., Brown, A., Barnes, B., Mulkay, M., Fuller, S., & Bloor, D. (1997). Thomas S. Kuhn (18 July 1922-17 June 1996). *Soc Stud Sci*, 27(3), 483-502.
- Ellul, J. (2021). *The technological society*. Vintage.
- Feenberg, A. (1991). *Critical theory of technology* (Vol. 5). Oxford University Press.
- Fox, N., Ward, K., & O'Rourke, A. (2006). A sociology of technology governance for the information age: The case of pharmaceuticals, consumer advertising and the Internet. *Sociology*, 40(2), 315-334.

- Fraunholz, B., & Unnithan, C. (2009). Does e-governance facilitate citizen empowerment in democracies? A critical discourse analysis. *International Journal of Electronic Governance*, 2(2-3), 131-155.
- Fussey, P., & Roth, S. (2020). Digitizing sociology: Continuity and change in the internet era. *Sociology*, 54(4), 659-674.
- Garrett, R. K. (2006). Protest in an information society: A review of literature on social movements and new ICTs. *Information, Communication & Society*, 9(02), 202-224.
- Giddens, A. (1986). *The constitution of society: Outline of the theory of structuration* (Vol. 349). Univ of California Press.
- Golding, P. (2000). Forthcoming features: information and communications technologies and the sociology of the future. *Sociology*, 34(1), 165-184.
- Haraway, D. J. (2000). A cyborg manifesto: Science, technology, and socialist-feminism in the late twentieth century. In *Posthumanism* (pp. 69-84). Palgrave, London.
- Haribabu, E. (1991). A large community but few peers: A study of the scientific community in India. *Sociological Bulletin*, 40(1-2), 77-88.
- Harindranath, G., & Sein, M. K. (2004). Conceptualizing the ICT artifact: Toward understanding the role of ICT in national development. *The Information Society*, 20(1), 15-24.
- Heeks, R. (2005). e-Government as a Carrier of Context. *Journal of Public Policy*, 25(1), 51-74.
- Heeks, R. (2006). *Implementing and managing e-government: An international text*. SAGE Publications.
- Heeks, R. (2008). ICT4D 2.0: The next phase of applying ICT for international development. *Computer, IEEE Xplore*, 41(6), 26-33.
- Heeks, R. (2017). *Information and communication technology for development (ICT4D)*. Routledge.
- Hirsch, W., & Barber, B. (1962). *The sociology of science*. New York Free Press of Glencoe.
- Hundal, H. S., & Chaudhuri, B. (2020, June). Digital identity and exclusion in welfare: Notes from the public distribution system in Andhra Pradesh and Karnataka. In *Proceedings*

*of the 2020 International Conference on information and communication technologies and development* (pp. 1-5).

Jaeger, P. T. (2022). Disability and the Internet. In *Disability and the Internet*. Lynne Rienner Publishers.

Johnson, D., & Wetmore, J. M. (2009). *Technology and society. Building our sociotechnical future*. Massachusetts Institute of Technology.

Kalam, A. A. (2005). *A vision of citizen-centric e-governance for India* (pp. 1-7). SAGE Publications.

Kamath, A. (2018). “Untouchable” cellphones? Old caste exclusions and new digital divides in peri-urban Bangalore. *Critical Asian Studies*, 50(3), 375-394.

Karan, A. K. (2018). *E-governance initiatives: A study of e-governance initiatives set off by the revenue & disaster management department, Odisha. Project Report.*  
[https://rotiodisha.nic.in/files/29102018/Publication%20And%20Training%20Material/Project%20Reports%20of%20Trainees/E-Governance/Ashok%20Kumar%20Karna\\_22nd%20batch.pdf](https://rotiodisha.nic.in/files/29102018/Publication%20And%20Training%20Material/Project%20Reports%20of%20Trainees/E-Governance/Ashok%20Kumar%20Karna_22nd%20batch.pdf)

Khera, R. (2011). Trends in diversion of grain from the public distribution system. *Economic and Political Weekly*, 46(21), 106-114.

Khera, R. (2017). Impact of Aadhaar on welfare programmes. *Economic and Political Weekly*, 61-70.

Kline, R., & Pinch, T. (1999). The social construction of technology. *The Social Shaping of Technology*, 2, 113-115.

Krishna, V. V. (2014). Changing social relations between science and society: Contemporary challenges. *Science, Technology and Society*, 19(2), 133-159.

Krishna, V. V. (2016). *Policy brief: Science, technology and innovation policy in India: Some recent changes*. Centre for Social Innovation.

Kuhn, T. (1962). *The structure of scientific revolutions*. University of Chicago Press.

Latour, B. (1987). *Science in action: How to follow scientists and engineers through society*. Harvard University Press.

- Latour, B. (1991). The impact of science studies on political philosophy. *Science, Technology, & Human Values*, 16(1), 3-19.
- Lee, C. P., Chang, K., & Berry, F. S. (2011). Testing the development and diffusion of e-government and e-democracy: A global perspective. *Public Administration Review*, 71(3), 444-454.
- Lupton, D (2017). *Myth of digital democracy*. Routledge.
- Lupton, D. (2014). *Digital sociology*. Routledge.
- Lyon, D. (2001). *Surveillance society: Monitoring everyday life*. McGraw-Hill Education.
- Lyon, D. (2007). *Surveillance studies: An overview*. Wiley
- Lyon, D. (2013). *The information society: Issues and illusions*. John Wiley & Sons.
- Lyon, D. (Ed.). (2003). *Surveillance as social sorting: Privacy, risk, and digital discrimination*. Psychology Press.
- MacKenzie, D., & Wajcman, J. (1999). *The social shaping of technology*. Open University Press.
- Madon, S. (1993). Introducing administrative reform through the application of computer-based information systems: A case study in India. *Public Administration and Development*, 13(1), 37-48.
- Madon, S., & Krishna, S. (2018). *The digital challenge: information technology in the development context: Information technology in the development context*. Routledge.
- Madon, S., & Madon, S. (2009). *E-Governance for Development* (pp. 53-70). Palgrave Macmillan UK.
- Madsen, O.J. (2014). Governmentality. In: Teo, T. (eds) *Encyclopedia of Critical Psychology*. Springer, New York, NY. [https://doi.org/10.1007/978-1-4614-5583-7\\_126](https://doi.org/10.1007/978-1-4614-5583-7_126)
- Majumdar, M. (2023, May 3). 52% of Indian population had internet access in 2022. The Economic Times. <https://economictimes.indiatimes.com/tech/technology/52-of-indian-population-had-internet-access-in-2022-says-report/articleshow/99964704.cms>

- Mallick, S., Haribabu, E., & Kulkarni, S. G. (2005). Debates on science and technology in India: Alliance formation between the scientific and political elite during the inter-war period. *Social Scientist*, 49-75.
- Marx, K., & Simon, L. H. (1994). *Selected writings*. Hackett Publishing.
- Masiero, S. (2019). The digitalization of anti-poverty programs: Aadhaar and the reform of social protection in India. In M. Graham (Ed.), *Digital Economies at Global Margins* (pp. 153-172). MIT Press.
- Masiero, S., & Prakash, A. (2015). Does computerisation reduce PDS leakage? Lessons from Karnataka. *Economic and Political Weekly*, 50(50), 77-79.
- Masiero, S., & Prakash, A. (2015, May). The politics of anti-poverty artefacts: Lessons from the computerization of the food security system in Karnataka. In *Proceedings of the Seventh International Conference on Information and Communication Technologies and Development* (pp. 1-10).
- Masiero, S., & Prakash, A. (2020). ICT in social protection schemes: Deinstitutionalising subsidy-based welfare programmes. *Information Technology & People*, 33(4), 1255-1280.
- McLuhan, M. (1994). *Understanding media: The extensions of man*. MIT press.
- MeitY. (2020). *National e-Governance plan*. <https://www.meity.gov.in/divisions/national-e-governance-plan>
- Merton, R. K. (1968). *Social theory and social structure*. Free Press.
- Merton, R. K. (1968). *Social theory and social structure*. Simon and Schuster.
- Merton, R. K. (1973) [1942]. *The normative structure of science*, in Merton, R. K. (ed.), *The sociology of science: Theoretical and empirical investigations*. University of Chicago Press, pp. 267–278.
- Merton, R. K. (1973). *The sociology of science: Theoretical and empirical investigations*. University of Chicago press.
- Ministry of Health and Family Welfare (2019-21). *National Family Health Survey (NFHS 2019-21)*. [https://main.mohfw.gov.in/sites/default/files/NFHS-5\\_Phase-II\\_0.pdf](https://main.mohfw.gov.in/sites/default/files/NFHS-5_Phase-II_0.pdf)
- Mulkay, M. (1980). Part one sociology of science in the west. *Current Sociology*, 28(3), 1-116.

- Mulkay, M. (2014). *Science and the sociology of knowledge (RLE social theory)*. Routledge.
- Nandi, B. (2002). Role of Telecommunications in Developing Countries in the 21st century, 14th Biennial Conference Seoul: International Telecommunications Society (ITS), 2002
- Norris P. (2001). *Digital divide: Civic engagement, information poverty and the internet in democratic societies*. Cambridge University Press.
- Norris, P. (2011). *Democratic deficit: Critical citizens revisited*. Cambridge University Press.
- OECD, O. (2004). The OECD principles of corporate governance.
- OECD, O. (2019). *Social Impact Investment 2019 The Impact Imperative for Sustainable Development*. OECD.
- Ogburn, W. F. & Nimkoff, M. F. (1955) *Technology and the changing family*, Houghton Mifflin, Boston, MA
- Ogburn, W. F. (1922) *Social change: With respect to culture and original nature*, Huebsch, New York.
- Patnaik P., Pattnaik S., & Singh P. (2020). Use of data analytics for effective e-governance: A case study of “EMutation” system of Odisha. In: Borah, S., Emilia Balas, V., & Polkowski, Z (Ed.), *Advances in data science and management. Lecture notes on data engineering and communications technologies* (pp.37). Springer.
- Patnaik, P., & Pattnaik, S. (2020). *Impact of decision science on e-governance: A study on Odisha land records system*. In Patnaik, S., Ip, A., Tavana, M. & Jain, V (Ed.) *New paradigm in decision science and management advances in intelligent systems and computing* (pp. 1005). Springer.
- Pinch, T. (2012). The social construction of technology: A review. *Technological change*, 17-35.
- Pinch, T. J., & Bijker, W. E. (1984). The social construction of facts and artefacts: Or how the sociology of science and the sociology of technology might benefit each other. *Social Studies of Science*, 14(3), 399-441.
- Postman, N. (2011). *Technopoly: The surrender of culture to technology*. Vintage.
- Prabhu, C. S. R. (2013). *E-governance: concepts and case studies*. PHI Learning Pvt. Ltd.

- Press Information Bureau. (2010, February). *NeGP Focuses on e-Delivery*.  
<https://pib.gov.in/newsite/PrintRelease.aspx?relid=68736>
- Qureshi, S. (2015). Are we making a better world with information and communication technology for development (ICT4D) research? Findings from the field and theory building. *Information Technology for Development*, 21(4), 511-522.
- Rose, N., O'malley, P., & Valverde, M. (2006). Governmentality. *Annu. Rev. Law Soc. Sci.*, 2, 83-104.
- Roztock, N., Soja, P., & Weistroffer, H. R. (2019). The role of information and communication technologies in socioeconomic development: towards a multi-dimensional framework. *Information Technology for Development*, 25(2), 171-183.
- Sahoo, D. K., & Sahoo, P. K. (2022). Efficiency, productivity dynamics and determinants of productivity growth in Indian telecommunication industries: *An empirical analysis*. *Journal of Public Affairs*, 22(1), e2353.
- Sahu, S., Chandra, G., & Dwivedi, S. K. (2019, November). E-Governance Initiatives and Challenges in the State of Uttar Pradesh. In 2019 International Conference on Cutting-edge Technologies in Engineering (ICon-CuTE) (pp. 108-112). IEEE.
- Sangita S. N., & Dash B. C. (2008). ICT, governance and service delivery in India: A critical review. *Indian Journal of Public Administration*, 74(1), 141-161.
- Sassen, S. (2002). Towards a sociology of information technology. *Current Sociology*, 50(3), 365-388.
- Schwab, K. (2017). *The fourth industrial revolution*. Currency.
- Selwyn, N. (2003). Apart from technology: understanding people's non-use of information and communication technologies in everyday life. *Technology in Society*, 25(1), 99-116.
- Selwyn, N. (2004). Reconsidering political and popular understandings of the digital divide. *New Media & Society*, 6(3), 341-362.
- Singh, P. (2020). Challenges of e-governance in rural areas of Haryana. *Studies in Indian Place Names*, 40(3), 1583-1604.
- Sismondo, S. (2010). *An introduction to science and technology studies*. John Wiley & Sons.

- Sismondo, S. (2018). Science and technology studies. In *Companion to Environmental Studies* (pp. 356-359). Routledge.
- Smith, M. R., & Marx, L. (Eds.). (1994). *Does technology drive history?: The dilemma of technological determinism*. MIT Press.
- Sreekumar, T. T. (2011). *ICTs and development in India: Perspectives on the rural network society*. Anthem Press.
- Sreekumar, T. T., & Rivera-Sánchez, M. (2008). ICTs and development: Revisiting the Asian experience. *Science, Technology and Society*, 13(2), 159-174.
- Statista. (2023, May 22). *Leading online markets based on internet penetration rate 2023*. <https://www.statista.com/statistics/227082/countries-with-the-highest-internet-penetration-rate/>
- Telecom Regulatory Authority of India. (2022). *Indian telecom services performance indicator July-September 2022 report*. [https://traai.gov.in/sites/default/files/PR\\_No.08of2023.pdf](https://traai.gov.in/sites/default/files/PR_No.08of2023.pdf)
- Telecom Regulatory Authority of India. (2023). *Telecom subscription data as on 31st March, 2023, telecom subscription report*. [https://www.traai.gov.in/sites/default/files/PR\\_No.46of2023\\_0.pdf](https://www.traai.gov.in/sites/default/files/PR_No.46of2023_0.pdf)
- Thakkar, S., Miller, P., Palackal, A., & Shrum, W. M. (2022). Internet and mobile use: Exploring the gendered digital divide in Kerala. *Loyola Journal of Social Sciences*, 34(2), 35-56.
- The Gazette of India (2000, June). The Information Technology Act, 2000 <https://www.meity.gov.in/writereaddata/files/itbill2000.pdf>
- The Gazette of India (2023, August). The Digital Personal Data Protection Act, 2023 <https://www.meity.gov.in/writereaddata/files/Digital%20Personal%20Data%20Protection%20Act%202023.pdf>
- Thomas, M. (Ed.). (2011). *Deconstructing digital natives: Young people, technology, and the new literacies*. Taylor & Francis.
- UIDAI. (2022). Unique Identification Authority of India (UIDAI) annual report 2021-22. [https://uidai.gov.in/images/UIDAI\\_Annual\\_Report\\_21\\_22.pdf](https://uidai.gov.in/images/UIDAI_Annual_Report_21_22.pdf)

- United Nations Development Programme. (2001, September). Information communications technology for development.  
[http://web.undp.org/evaluation/documents/essentials\\_5.pdf](http://web.undp.org/evaluation/documents/essentials_5.pdf)
- United Nations Educational, Scientific and Cultural Organization. (2005, August). *Defining e-governance*.  
[https://webarchive.unesco.org/20161021003528/http://portal.unesco.org/ci/en/ev.php-URL\\_ID=4404&URL\\_DO=DO\\_TOPIC&URL\\_SECTION=201.html](https://webarchive.unesco.org/20161021003528/http://portal.unesco.org/ci/en/ev.php-URL_ID=4404&URL_DO=DO_TOPIC&URL_SECTION=201.html)
- Van Dijk, J. A. (2005). *The deepening divide: Inequality in the information society*. SAGE Publications.
- Wadhwa, M. (2020). e-Governance in healthcare sector in India. CSD Working Paper Series: Towards a New Indian Model of Information and Communications Technology-Led Growth and Development, Centre for Sustainable Development (CSD).
- Wajcman, J. (2002). Addressing technological change: The challenge to social theory. *Current Sociology*, 50(3), 347-363.
- Wajcman, J. (2008). Life in the fast lane? Towards a sociology of technology and time. *The British Journal of Sociology*, 59(1), 59-77.
- Wallace, C. (2012). Can information and communications technology enhance social quality?. *The International Journal of Social Quality*, 2(2), 98-117.
- Warschauer, M. (2003). Demystifying the digital divide. *Scientific American*, 289(2), 42-47.
- Wellman, B., & Haythornthwaite, C. (2002). *The internet in everyday life*. Blackwell Publisher.
- Winner, L. (1978). *Autonomous technology: Technics-out-of-control as a theme in political thought*. MIT Press.
- Winner, L. (1993). Upon opening the black box and finding it empty: Social constructivism and the philosophy of technology. *Science, Technology, & Human Values*, 18(3), 362-378.
- World Bank. (1992). *World development report 1992*. Oxford University Press.  
[https://www.student.uniaugsburg.de/de/fachschaften/politik/service/downloads/internationale Politik/world\\_development\\_reports/1992.pdf](https://www.student.uniaugsburg.de/de/fachschaften/politik/service/downloads/internationale_Politik/world_development_reports/1992.pdf)
- World Bank. (2005). *World development indicators 2005*. The World Bank.

Yadav, K., & Tiwari, S. (2014). e-Governance in India: Opportunities and challenges. *Advance in Electronic and Electric Engineering*, 4(6), 675-680.

Zuckerman, H. (1988). The sociology of science. In N. J. Smelser (Ed.), *Handbook of sociology* (pp. 511–574). Sage Publications.

## **Web Sources**

<http://gisodisha.nic.in/Block/JAGATSINGHPUR.pdf>

<https://bhulekh.ori.nic.in/RoRView.aspx>

<https://censusindia.gov.in/nada/index.php/catalog/937/study-description>

<https://csc.gov.in/>

<https://edodisha.gov.in/>

<https://historyofict.wordpress.com/2016/09/30/the-history-of-ict/>

<https://jagatsinghpur.nic.in/>

<https://landrecords.karnataka.gov.in/>

<https://nfsa.gov.in/State/OR>

<https://samsodisha.gov.in/>

<https://www.csc.gov.in/>

<https://www.indiastat.com/>

<https://www.meity.gov.in/divisions/national-e-governance-plan>

<https://www.nic.in/servicecontents/nicnet/>

[www.deity.gov.in](http://www.deity.gov.in)

[www.egov.mit.gov.in](http://www.egov.mit.gov.in)

[www.negp.gov.in](http://www.negp.gov.in)

## ***Panchayat*: Casteism and Mockery in the Name of Humour**

*Panchayat* on Amazon Prime uses humour to draw attention to casteism, in what is a wasted opportunity.

DHIRENDRA KUMAR SAHOO, ANIRUDDHA JENA

Humour can be used as a form of social commentary and critique, and *Panchayat* (2020) on Amazon Prime often uses humour to portray the injustices and inequalities of the caste system in India while presenting an unreal version of caste society. It focuses on the politics and issues surrounding the administration of a rural village, particularly in regards to the dominance of upper-caste individuals, specifically Brahmins, with the surnames Dubey, Tripathi, and Shukla. The show highlights the reinforcement of casteism through various routine activities and the naming of office bearers in the panchayat board. The central characters include Abhishek Tripathi, played by Jitendra Kumar, who takes on a low-paying job as the panchayat secretary, Manju Devi, played by Neena Gupta, who serves as the village pradhan but whose husband holds the real power, and Prahlad Pandey, played by Faisal Malik, the deputy pradhan and Vikas, played by Chandan Roy, the office assistant. Aanchal Tiwari portrays Rinky's buddy Raveena, Anup Sharma plays Rajkumar bhaiya, and the ward member's surname is Chakraborty. Additionally, the names Kulkarni, Tiwari, Dubey, Pandit, Pathak, Mishra, Pandey, and Joshi appear in the roll of credits.

That said, the now-two-season-old *Panchayat* series, which is set in Uttar Pradesh, has been widely criticised for perpetuating the harmful and misleading stereotype of rural life as being dominated by Brahmins. Created and produced by a Savarna cast and crew, the series presents a romanticised view of a local government that is exclusively composed of upper-caste office bearers. It has garnered both acclaim and censure, with the former coming from upper-caste individuals whose perspectives on India may be limited by their own narrow experiences. The series has been criticised for perpetuating stereotypes and using humour to trivialise issues of caste, as well as promoting a distorted and meritless depiction of a "Brahminical Utopia."

The story is told as a rural comedy and emphasises the power dynamics in the village administration. The use of humour to address issues of caste and marginalisation is misguided, as it only serves to mock and reinforce the systemic discrimination faced by marginalised communities. For example, in one episode, a character is seen making fun of another character's lower-caste background, pointing out how they are often denied access to certain resources and opportunities. This use

## ACADEMIC PAPER

WILEY

# Efficiency, productivity dynamics and determinants of productivity growth in Indian telecommunication industries: An empirical analysis

Dhirendra Kumar Sahoo<sup>1</sup>  | Pradipta Kumar Sahoo<sup>2</sup> 

<sup>1</sup>School of Social Science, University of Hyderabad, Telangana, India

<sup>2</sup>Department of Liberal Arts, Indian Institute of Technology Hyderabad, Sangareddy, Telangana, India

## Correspondence

Pradipta Kumar Sahoo, Department of Liberal Arts, Indian Institute of Technology Hyderabad, Sangareddy, Telangana, India.  
Email: pradiptaiith@gmail.com

This paper examines the efficiency and productivity dynamics of the Indian telecommunication sector with the help of non-parametric Data Envelopment Analysis approach for the period 2008–2015. The study finds that the year-wise mean Total factor productivity (TFP) growth is positive in 2011 and 2013 only, where the overall TFP growth is negative. From the components of TFP growth, we find that the negative growth of the firm is due to the negative technology change, not due to the change of inefficiency of the firms. However, the mean efficiency score is positive and is backed by a scale efficiency change. Further, from the dynamic-GMM model, the study ascertains that the determinants of TFP growth are positively affected by profit intensity, advertisement intensity, import intensity and capital intensity and negatively affected by the firm's debt ratio in case of Indian telecommunication forms. This finding suggests to the policymaker that by increasing the key determinants, the performance of telecommunication firms can be increased.

## JEL CLASSIFICATION

D24; D61; L96

## 1 | INTRODUCTION

Over the last two decades, the telecommunication industry has established its identity in the world market due to the constant development and adoption of new technology in the field of information and communication services. It helps to allow the cross-border information flow with low transaction costs and accelerate the diffusion of knowledge with improving the market information. In recent times, telecommunication is considered as an essential part of human life and for the rapid development of the global economy. As a result, for the structural transformation of the various sectors, the importance of communication services has increased by the industry people and government agencies.

In the present era, the telecommunication sector in India is considered as a highly demanded service sector. After the liberalization period, it has changed drastically and become the world's second largest extensive network of telecommunication subscribers. It accounts for 70% of the rural population are using the telecommunication facilities, and the rural market would be the significant growth drivers in

the recent future (IBEF, 2018). The government of India announces the National Digital Communication Policy in 2018. Through this policy, the government targeted to invest an amount of USD 100 billion and to create 4 million jobs by 2022 (IBEF, 2018). For the development of the Indian telecommunication sectors, the telecommunication industries are rapidly using new technologies. The recent substantial change of technology with the increased use of fiber-optic cables, microwave, satellite, radio wave technology and cellular services strengthens the future sustainability of telecommunication sectors. In this regard, we try to measure the performances of the telecommunication firms in India by measuring their productivity and efficiency. As various studies by Biancini (2011), Narayana (2011) and Bacchiocchi, Florion, and Gambaro (2011) highlight that the growth of the economy is dependent on the development of the telecommunication sector. Other studies by Gordon and Gupta (2004) and Eichengreen and Gupta (2011) illustrate that in the case of service sector, information communication services are the prime drivers of India's economic growth. So, the development of the telecom sector is only possible with the higher productivity and efficiency of this sector. To



CENTRE FOR THE STUDY OF LAW AND GOVERNANCE  
JAWAHARLAL NEHRU UNIVERSITY, NEW DELHI



RAJIV GANDHI NATIONAL INSTITUTE OF YOUTH DEVELOPMENT, TAMIL NADU



# CERTIFICATE OF PRESENTATION



The following award is given to

Shirendra Kumar Sahoo

For presenting the paper titled:

ICTs and e-Governance Journey of India : Looking through Common Service Centre  
and participating in the National Conference on

"Local Governance in India @ 75: Issues, Challenges, and Contemporary Developments"

held on 25th & 26th March 2023, organised by Centre for the Study of Law and  
Governance (CSLG), Jawaharlal Nehru University, New Delhi, in association with Rajiv Gandhi  
National Institute of Youth Development (RGNIYD), Tamil Nadu.

**PROF. PRAKASH CHAND KANDPAL**

Convenor & Chairperson  
Centre for the Study of Law and Governance  
Jawaharlal Nehru University  
New Delhi

**PROF.INDERJEET SINGH SODHI**

Convener, Professor & Head, Department of Public  
Administration, RGNIYD, Regional  
Centre, Chandigarh (Ministry of Youth  
Affairs & Sports, Govt of India)

With the support of the  
Erasmus+ Programme  
of the European Union



# CERTIFICATE FOR PRESENTATION

## 13th Slovenian Social Science Conference

This certificate is awarded to:

**Dhirendra Sahoo**

We confirm that Dhirendra Sahoo has participated with Abstract  
*Mapping Digital Technology and Social Media: The Impact of the ICTs on Youth in Odisha, India*  
in the 13th Slovenian Social Science Conference in Nova Gorica, Slovenia.

Nova Gorica, November 11th - 13th 2021

**MATEJ  
MAKAROVIČ**

Digitally signed by  
MATEJ MAKAROVIČ  
Date: 2021.12.07  
10:37:47 +01'00'

prof. Matej Makarovič, PhD.  
President of the Slovenian MOST - UNESCO  
National Committee

**BORUT  
RONCEVIC**

Digitally signed by  
BORUT RONCEVIC  
Date: 2021.12.06  
13:48:34 +01'00'

prof. Borut Rončević, PhD.  
Dean of FUDŠ / SASS

FUDŠ / SASS

FAKULTETA ZA UPORABNE DRUŽBENE ŠTUDIJE / SCHOOL OF ADVANCED SOCIAL STUDIES

Gregorčičeva ulica 19, 5000 Nova Gorica, Slovenija, [www.fuds.si](http://www.fuds.si)

## FIELDWORK PHOTOGRAPHS

**Gram Panchayat office of Dhinkia**



**Gram Panchayat office of Ersama**



**The Village Level Enterprenure is narrating the ICT-led e-governance services in the  
Dhinkia village**



**The beneficiaries of ration card holder are in queue to get the ration at Dhinkia Gram  
Panchayat**



## Common Service Centre of Ersama



## Interaction with VLE of Ersama village



Available ICT-led services at CSC (written in Odia language)



Betel vineyards in the village



**CSC camp in the village**



**District Informatics Officer, Jagatsinghpur district**



## Interaction with NIC official and Tahsildar of Ersama block



## Interaction with respondents of Ersama village



## Interaction with Respondents



## Digital Literacy Programme



[illegible]

ଭଙ୍ଗା କୁଡ଼ିଆରେ ଦିବ୍ୟାଙ୍କ ପରିବାର

[illegible]

**Source: Photo collected from secondary sources**

**Source: All the above photos captured during the field visit**

***Note: The photograph is captured with the consent of respondents and concerned officials.***

# Information and Communication Technologies (ICTs) in Governance: A Sociological Study in Rural Odisha

*by* Dhirendra Kumar Sahoo



Librarian  
Indira Gandhi Memorial Library  
UNIVERSITY OF HYDERABAD  
Central University P.O.  
HYDERABAD-500 046

---

**Submission date:** 25-Aug-2023 03:03PM (UTC+0530)

**Submission ID:** 2151065742

**File name:** Dhirendra\_Kumar\_Sahoo.pdf (1.45M)

**Word count:** 56417

**Character count:** 309051

# Information and Communication Technologies (ICTs) in Governance: A Sociological Study in Rural Odisha

## ORIGINALITY REPORT

7 %

SIMILARITY INDEX

5 %

INTERNET SOURCES

4 %

PUBLICATIONS

2 %

STUDENT PAPERS

## PRIMARY SOURCES

|   |                                                                                                                                             |      |
|---|---------------------------------------------------------------------------------------------------------------------------------------------|------|
| 1 | "Global Encyclopedia of Public Administration, Public Policy, and Governance", Springer Science and Business Media LLC, 2018<br>Publication | <1 % |
| 2 | prsindia.org<br>Internet Source                                                                                                             | <1 % |
| 3 | digitalcommons.aaru.edu.jo<br>Internet Source                                                                                               | <1 % |
| 4 | Submitted to Tata Institute of Social Sciences<br>Student Paper                                                                             | <1 % |
| 5 | core.ac.uk<br>Internet Source                                                                                                               | <1 % |
| 6 | "Handbook of Communication for Development and Social Change", Springer Science and Business Media LLC, 2020<br>Publication                 | <1 % |
| 7 | archiv.ub.uni-heidelberg.de<br>Internet Source                                                                                              | <1 % |

|    |                                                                                                                                                                                                                            |      |
|----|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 8  | <a href="http://www.insightsonindia.com">www.insightsonindia.com</a><br>Internet Source                                                                                                                                    | <1 % |
| 9  | Submitted to Riga Technical University<br>Student Paper                                                                                                                                                                    | <1 % |
| 10 | Sangita Dhal. "Situating Digital India Mission in Pursuit of Good Governance: A Study of Electronic Governance Initiatives in the Indian Province of Odisha", Indian Journal of Public Administration, 2020<br>Publication | <1 % |
| 11 | <a href="http://dokumen.pub">dokumen.pub</a><br>Internet Source                                                                                                                                                            | <1 % |
| 12 | <a href="http://www.csi-sigegov.org">www.csi-sigegov.org</a><br>Internet Source                                                                                                                                            | <1 % |
| 13 | <a href="http://www.universityofcalicut.info">www.universityofcalicut.info</a><br>Internet Source                                                                                                                          | <1 % |
| 14 | <a href="http://www.coursehero.com">www.coursehero.com</a><br>Internet Source                                                                                                                                              | <1 % |
| 15 | Sunil K. Muttou, Rajan Gupta, Saibal K. Pal. "E-Governance in India", Springer Science and Business Media LLC, 2019<br>Publication                                                                                         | <1 % |
| 16 | <a href="http://ijhumas.com">ijhumas.com</a><br>Internet Source                                                                                                                                                            | <1 % |
| 17 | <a href="http://planningcommission.gov.in">planningcommission.gov.in</a><br>Internet Source                                                                                                                                | <1 % |

<1 %

18

[rural.nic.in](http://rural.nic.in)

Internet Source

<1 %

19

[www.agieducation.org](http://www.agieducation.org)

Internet Source

<1 %

20

Maitrayee Mukerji. "ICTs and Development",  
Springer Science and Business Media LLC,  
2013

Publication

<1 %

21

[www.civildaily.com](http://www.civildaily.com)

Internet Source

<1 %

22

[link.springer.com](http://link.springer.com)

Internet Source

<1 %

23

V. V. Krishna. "India @ 75: Science, Technology  
and Innovation Policies for Development",  
Science, Technology and Society, 2021

Publication

<1 %

24

[itforchange.net](http://itforchange.net)

Internet Source

<1 %

25

[mzuir.inflibnet.ac.in](http://mzuir.inflibnet.ac.in)

Internet Source

<1 %

26

Bidisha Chaudhuri. "Programmed welfare: An  
ethnographic account of algorithmic practices

<1 %

in the public distribution system in India",  
New Media & Society, 2022

Publication

- 
- |    |                                                                                   |      |
|----|-----------------------------------------------------------------------------------|------|
| 27 | <a href="http://www.desorissa.nic.in">www.desorissa.nic.in</a><br>Internet Source | <1 % |
|----|-----------------------------------------------------------------------------------|------|
- 
- |    |                                                                                                                       |      |
|----|-----------------------------------------------------------------------------------------------------------------------|------|
| 28 | Keith N. Hampton, Barry Wellman.<br>"EDITORIAL COMMENT", Information,<br>Communication & Society, 2008<br>Publication | <1 % |
|----|-----------------------------------------------------------------------------------------------------------------------|------|
- 
- |    |                                                                                 |      |
|----|---------------------------------------------------------------------------------|------|
| 29 | <a href="http://uploads.iasscore.in">uploads.iasscore.in</a><br>Internet Source | <1 % |
|----|---------------------------------------------------------------------------------|------|
- 
- |    |                                                                         |      |
|----|-------------------------------------------------------------------------|------|
| 30 | <a href="http://iasgatewayy.com">iasgatewayy.com</a><br>Internet Source | <1 % |
|----|-------------------------------------------------------------------------|------|
- 
- |    |                                                                                 |      |
|----|---------------------------------------------------------------------------------|------|
| 31 | <a href="http://www.samanyagyan.com">www.samanyagyan.com</a><br>Internet Source | <1 % |
|----|---------------------------------------------------------------------------------|------|
- 
- |    |                                                                       |      |
|----|-----------------------------------------------------------------------|------|
| 32 | <a href="http://cdn1.byjus.com">cdn1.byjus.com</a><br>Internet Source | <1 % |
|----|-----------------------------------------------------------------------|------|
- 
- |    |                                                         |      |
|----|---------------------------------------------------------|------|
| 33 | <a href="http://tarj.in">tarj.in</a><br>Internet Source | <1 % |
|----|---------------------------------------------------------|------|
- 
- |    |                                                                                     |      |
|----|-------------------------------------------------------------------------------------|------|
| 34 | <a href="http://www.businessstoday.in">www.businessstoday.in</a><br>Internet Source | <1 % |
|----|-------------------------------------------------------------------------------------|------|
- 
- |    |                                                                                                                        |      |
|----|------------------------------------------------------------------------------------------------------------------------|------|
| 35 | "Role of IT- ITES in Economic Development of<br>Asia", Springer Science and Business Media<br>LLC, 2020<br>Publication | <1 % |
|----|------------------------------------------------------------------------------------------------------------------------|------|
-

36

Submitted to University of Hyderabad,  
Hyderabad

Student Paper

&lt;1 %

37

[www.iceg.net](http://www.iceg.net)

Internet Source

&lt;1 %

38

Submitted to De Montfort University

Student Paper

&lt;1 %

39

Erickson, M.. "Why should I read histories of  
science?", History of the Human Sciences,  
2010.

Publication

&lt;1 %

40

[gadmin.uohyd.ac.in](http://gadmin.uohyd.ac.in)

Internet Source

&lt;1 %

41

[networkcultures.org](http://networkcultures.org)

Internet Source

&lt;1 %

42

Submitted to Xavier University

Student Paper

&lt;1 %

43

Paul Forman. "The Primacy of Science in  
Modernity, of Technology in Postmodernity,  
and of Ideology in the History of Technology",  
History and Technology, 2007

Publication

&lt;1 %

44

[nirdpr.org.in](http://nirdpr.org.in)

Internet Source

&lt;1 %

45

[www.tarj.in](http://www.tarj.in)

Internet Source

<1 %

46

N. P. Singh, Manisha Kaushik. "Critical Analysis of Growth Strategies for Telecom Stake Holders in Rural India", International Journal of Information Communication Technologies and Human Development, 2013

Publication

<1 %

47

[himachalservices.nic.in](http://himachalservices.nic.in)

Internet Source

<1 %

48

[vdocuments.site](http://vdocuments.site)

Internet Source

<1 %

49

Darpan Anand, Vineeta Khemchandani. "Study of e-governance in India: a survey", International Journal of Electronic Security and Digital Forensics, 2019

Publication

<1 %

50

Venni V. Krishna. "Changing Social Relations between Science and Society: Contemporary Challenges", Science, Technology and Society, 2014

Publication

<1 %

51

[gnanaganga.inflibnet.ac.in:8080](http://gnanaganga.inflibnet.ac.in:8080)

Internet Source

<1 %

52

[mro.massey.ac.nz](http://mro.massey.ac.nz)

Internet Source

<1 %

|    |                                                                                                                                                         |      |
|----|---------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 53 | <a href="http://nrl.northumbria.ac.uk">nrl.northumbria.ac.uk</a><br>Internet Source                                                                     | <1 % |
| 54 | <a href="http://www.dhyeyaias.com">www.dhyeyaias.com</a><br>Internet Source                                                                             | <1 % |
| 55 | <a href="http://www.digitalasiahub.org">www.digitalasiahub.org</a><br>Internet Source                                                                   | <1 % |
| 56 | Submitted to Midlands State University<br>Student Paper                                                                                                 | <1 % |
| 57 | <a href="http://needqois.files.wordpress.com">needqois.files.wordpress.com</a><br>Internet Source                                                       | <1 % |
| 58 | "The Role of Digital Technologies in Shaping the Post-Pandemic World", Springer Science and Business Media LLC, 2022<br>Publication                     | <1 % |
| 59 | Dilip Dutta. "Development under Dualism and Digital Divide in Twenty-First Century India", Springer Science and Business Media LLC, 2018<br>Publication | <1 % |
| 60 | <a href="http://www.tribuneindia.com">www.tribuneindia.com</a><br>Internet Source                                                                       | <1 % |
| 61 | A Critical Impulse to e-Governance in the Asia Pacific, 2013.<br>Publication                                                                            | <1 % |
| 62 | Submitted to De La Salle University<br>Student Paper                                                                                                    |      |

<1 %

63

[allafrica.com](http://allafrica.com)

Internet Source

<1 %

64

[blog.forumias.com](http://blog.forumias.com)

Internet Source

<1 %

65

[vdocument.in](http://vdocument.in)

Internet Source

<1 %

66

"Blurring the Boundaries Through Digital Innovation", Springer Science and Business Media LLC, 2016

Publication

<1 %

67

Submitted to Colorado Technical University

Student Paper

<1 %

68

Technological Development in China India and Japan, 1986.

Publication

<1 %

69

[econjournals.com](http://econjournals.com)

Internet Source

<1 %

70

[documents1.worldbank.org](http://documents1.worldbank.org)

Internet Source

<1 %

71

[equityhealthj.biomedcentral.com](http://equityhealthj.biomedcentral.com)

Internet Source

<1 %

72

Submitted to National Tsing Hua University

Student Paper

<1 %

|    |                                                                                                                                    |      |
|----|------------------------------------------------------------------------------------------------------------------------------------|------|
| 73 | <a href="http://library.arce.org">library.arce.org</a><br>Internet Source                                                          | <1 % |
| 74 | Submitted to Letterkenny Institute of Technology<br>Student Paper                                                                  | <1 % |
| 75 | <a href="http://baadalsg.inflibnet.ac.in">baadalsg.inflibnet.ac.in</a><br>Internet Source                                          | <1 % |
| 76 | <a href="http://biometrisches-kolloquium2018.de">biometrisches-kolloquium2018.de</a><br>Internet Source                            | <1 % |
| 77 | <a href="http://ebin.pub">ebin.pub</a><br>Internet Source                                                                          | <1 % |
| 78 | <a href="http://etd.hu.edu.et">etd.hu.edu.et</a><br>Internet Source                                                                | <1 % |
| 79 | <a href="http://etd.ohiolink.edu">etd.ohiolink.edu</a><br>Internet Source                                                          | <1 % |
| 80 | <a href="http://medium.com">medium.com</a><br>Internet Source                                                                      | <1 % |
| 81 | <a href="http://publications.azimpremjifoundation.org">publications.azimpremjifoundation.org</a><br>Internet Source                | <1 % |
| 82 | <a href="http://www.jmi.ac.in">www.jmi.ac.in</a><br>Internet Source                                                                | <1 % |
| 83 | Hakikur Rahman. "Chapter 2 Framework of E-governance at the Local Government Level", Springer Science and Business Media LLC, 2010 | <1 % |

- 
- |    |                                                                                                                                                                                                            |        |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 84 | <p>Jayajit Chakraborty, M. Martin Bosman.<br/>"Measuring the Digital Divide in the United States: Race, Income, and Personal Computer Ownership", The Professional Geographer, 2005</p> <p>Publication</p> | $<1\%$ |
|----|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------|
- 
- |    |                                                                                     |        |
|----|-------------------------------------------------------------------------------------|--------|
| 85 | <p>Submitted to Lutheran High School of St. Charles County</p> <p>Student Paper</p> | $<1\%$ |
|----|-------------------------------------------------------------------------------------|--------|
- 
- |    |                                              |        |
|----|----------------------------------------------|--------|
| 86 | <p>digital.zlb.de</p> <p>Internet Source</p> | $<1\%$ |
|----|----------------------------------------------|--------|
- 
- |    |                                              |        |
|----|----------------------------------------------|--------|
| 87 | <p>dspace.unza.zm</p> <p>Internet Source</p> | $<1\%$ |
|----|----------------------------------------------|--------|
- 
- |    |                                            |        |
|----|--------------------------------------------|--------|
| 88 | <p>mdpi-res.com</p> <p>Internet Source</p> | $<1\%$ |
|----|--------------------------------------------|--------|
- 
- |    |                                           |        |
|----|-------------------------------------------|--------|
| 89 | <p>quieora.ink</p> <p>Internet Source</p> | $<1\%$ |
|----|-------------------------------------------|--------|
- 
- |    |                                                         |        |
|----|---------------------------------------------------------|--------|
| 90 | <p>www.business-standard.com</p> <p>Internet Source</p> | $<1\%$ |
|----|---------------------------------------------------------|--------|
- 
- |    |                                                            |        |
|----|------------------------------------------------------------|--------|
| 91 | <p>Submitted to DPS International</p> <p>Student Paper</p> | $<1\%$ |
|----|------------------------------------------------------------|--------|
- 
- |    |                                                                                                                                                     |        |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------|
| 92 | <p>P.K. Suri, Sushil. "Strategic Planning and Implementation of E-Governance", Springer Science and Business Media LLC, 2017</p> <p>Publication</p> | $<1\%$ |
|----|-----------------------------------------------------------------------------------------------------------------------------------------------------|--------|
-

|     |                                                                                                                      |      |
|-----|----------------------------------------------------------------------------------------------------------------------|------|
| 93  | Submitted to PES University<br>Student Paper                                                                         | <1 % |
| 94  | il-geneva2.civicplus.com<br>Internet Source                                                                          | <1 % |
| 95  | nregs-mp.org<br>Internet Source                                                                                      | <1 % |
| 96  | ojs.uok.edu.in<br>Internet Source                                                                                    | <1 % |
| 97  | www.loudoun.gov<br>Internet Source                                                                                   | <1 % |
| 98  | Submitted to London Metropolitan University<br>Student Paper                                                         | <1 % |
| 99  | Submitted to National University of Ireland,<br>Galway<br>Student Paper                                              | <1 % |
| 100 | eprints.qut.edu.au<br>Internet Source                                                                                | <1 % |
| 101 | jagatsinghpur.nic.in<br>Internet Source                                                                              | <1 % |
| 102 | www.studymode.com<br>Internet Source                                                                                 | <1 % |
| 103 | "The Palgrave Handbook of Technological<br>Finance", Springer Science and Business<br>Media LLC, 2021<br>Publication | <1 % |

|     |                                                                                                                                                                                                                       |      |
|-----|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------|
| 104 | Submitted to Harare Institute of Technology<br>Student Paper                                                                                                                                                          | <1 % |
| 105 | Submitted to Instituto de Empress S.L.<br>Student Paper                                                                                                                                                               | <1 % |
| 106 | Robinson, Kerry, Jones-Diaz, Criss. "EBOOK: Diversity and Difference in Childhood: Issues for Theory and Practice", EBOOK: Diversity and Difference in Childhood: Issues for Theory and Practice, 2017<br>Publication | <1 % |
| 107 | repository.sustech.edu<br>Internet Source                                                                                                                                                                             | <1 % |

Exclude quotes On

Exclude matches

< 14 words

Exclude bibliography On